Hawassa University Vice President for Research and Technology Transfer Research



## Abstracts of Research Articles Published by Hawassa University Academic Staff 2021

# Volume 5



Hawassa University Office of the Vice President for Research and Technology Transfer Research Programs Directorate



### Abstracts of Research Articles Published by Hawassa University Academic Staff in 2021

Compiled by

Mulye Girma (Ph.D.) Rahmeto Abebe (Associate Prof)

### Volume 5

June 2022 Hawassa, Ethiopia

#### Foreword

Hawass University has eight colleges (i.e., College of Agriculture, College of Business and Economics; College of Education; College of Law and Governance; College of Social Sciences and Humanities; College of Natural and Computational Sciences; College of Medicine and Health Sciences; Wondo Genet College of Forestry and Natural resources) and Institutes (i.e., the Institute of Technology; Institute of Policy and Development Research and Institute of Sidama Studies). The university has diverse and highly educated academic staff who are participating in teaching and research activities in these colleges and institutes. This book compiles abstracts of research articles published by the Academic staff of Hawassa University in 2021 in different local and international academic journals. This compiled abstract is the fifth volume published by the office of the Vice President for Research and Technology Transfer. The sixth volume of this book is finalized, and it will become public soon.

The abstracts included in this volume will be rich resources for academic staff, graduate students, undergraduate students, researchers working in governmental and non-governmental organizations. The book also provides a bird's eye view of diverse research topics with brief details about objectives, methods, analysis, and findings.

I want to convey my deepest appreciation and gratefulness to the academic staff of Hawassa University for their unreserved effort to participate in conducting research and sending their published abstracts to our office. I would also like to thank the staff who participated in compiling abstracts. I would promise you that Hawassa university provides the necessary assistance for academic staff to carry out their research as one of the research Universities selected by the Ministry of Science and Higher Education. Together, we will secure the objective to be one of the research universities' centers, and the university is moving from teaching toward a greater emphasis on research.

Thank you Tafesse Matewos (Ph.D.) Vice President for Research and Technology Transfer Hawassa University

#### Contents

Srinivasan, D., Meignanamoorthy, M., Ravichandran, M., Mohanavel, V., Alagarsamy, S. V., Chanakyan, C., Sakthivelu, S., Karthick, A., Prabhu, T. R., & Rajkumar, S. (2021). 3D Printing Manufacturing Techniques, Materials, and Applications: An Overview. Advances in Materials Science and Engineering, 2021. Scopus. https://doi.org/10.1155/2021/5756563

Redi, M., Dananto, M., & Thillaigovindan, N. (2021). A Bi-level Neuro-Fuzzy System Soft Computing for Reservoir Operation. *International Journal of Advances in Soft Computing and Its Applications*, *13*(3), 223–247. Scopus. https://doi.org/10.15849/IJASCA.211128.15 i

Yu, B., You, W., Fan, D.-M., Su, Y., & Nigatu, Z. M. (2021). A comparison of GRACE temporal gravity field models recovered with different processing details. *Geophysical Journal International*, 227(2), 1392–1417. Scopus. https://doi.org/10.1093/gji/ggab279 2

Bihari, S. P., Sadhu, P. K., Sarita, K., Khan, B., Arya, L. D., Saket, R. K., & Kothari, D. P. (2021).
A Comprehensive Review of Microgrid Control Mechanism and Impact Assessment for Hybrid
Renewable Energy Integration. *IEEE Access*, *9*, 88942–88958. Scopus.
https://doi.org/10.1109/ACCESS.2021.3090266

Pal, R., Chavhan, S., Gupta, D., Khanna, A., Padmanaban, S., Khan, B., & Rodrigues, J. J. P. C. (2021). A comprehensive review on IoT-based infrastructure for smart grid applications. *IET Renewable Power Generation*, *15*(16), 3761–3776. Scopus. https://doi.org/10.1049/rpg2.12272 4
Bhadane, K., Sanjeevikumar, P., Khan, B., Thakre, M., Ahmad, A., Jaware, T., Patil, D. P., & Pande, A. S. (2021). A Comprising Study on Modernization of Electric Vehicle Subsystems, Challenges, Opportunities and strategies for its Further Development. 2021 International Conference on Nascent Technologies in Engineering, ICNET 2021 - Proceedings. Scopus. https://doi.org/10.1109/ICNTE51185.2021.9487757

Alem, K. D., & Gebru, E. A. (2021). A cross-sectional analysis of refractive error prevalence and associated factors among elementary school children in Hawassa, Ethiopia. *Journal of International Medical Research*, *49*(3). Scopus. https://doi.org/10.1177/0300060521998894 5 Sathish, T., Chandramohan, D., Dinesh Kumar, S., Rajkumar, S., & Vijayan, V. (2021). A facile synthesis of Ag/ZnO nanocomposites prepared via novel green mediated route for catalytic activity. *Applied Physics A: Materials Science and Processing*, *127*(9). Scopus. https://doi.org/10.1007/s00339-021-04854-6 6 Banteywalu, S. M., Bekele, G., Khan, B., De Smedt, V., & Leroux, P. (2021). A high-reliability redundancy scheme for design of radiation-tolerant half-duty limited dc-dc converters. *Electronics (Switzerland)*, *10*(10). Scopus. https://doi.org/10.3390/electronics10101146 7 Nane, D., Hatløy, A., & Lindtjørn, B. (2021). A local-ingredients-based supplement is an alternative to corn-soy blends plus for treating moderate acute malnutrition among children aged 6 to 59 months: A randomized controlled non-inferiority trial in Wolaita, Southern Ethiopia. *PLoS ONE*, *16*(10 October). Scopus. https://doi.org/10.1371/journal.pone.0258715 7 Beyene, H., Hailu, D., Tadele, H., Persson, L. Å., & Berhanu, D. (2021). A mixed-methods study exploring adherence to the referral of severely sick children in primary health care in Southern Ethiopia. *Archives of Public Health*, *79*(1). Scopus. https://doi.org/10.1186/s13690-021-00681-6

Gupta, A., Pachar, R. K., Khan, B., Mahela, O. P., & Padmanaban, S. (2021). A multivariable transmission line protection scheme using signal processing techniques. *IET Generation, Transmission and Distribution*, *15*(22), 3115–3137. Scopus. https://doi.org/10.1049/gtd2.12244

Nigussie, B., Eifa, A., Tagesse, B., & Ketema, W. (2021). A neonatal hip septic arthritis caused by klebsiella pneumonia at hawassa university comprehensive specialized hospital neonatal unit, hawassa, sidama, ethiopia. *International Medical Case Reports Journal*, *14*, 471–474. Scopus. https://doi.org/10.2147/IMCRJ.S321935

Gangwar, A. K., Mahela, O. P., Rathore, B., Khan, B., Alhelou, H. H., & Siano, P. (2021). A Novel k-Means Clustering and Weighted k-NN-Regression-Based Fast Transmission Line Protection. *IEEE Transactions on Industrial Informatics*, *17*(9), 6034–6043. Scopus. https://doi.org/10.1109/TII.2020.3037869

Mahela, O. P., Bhati, V. S., Ahmad, G., Khan, B., Sanjeevikumar, P., Garg, A. R., & Mahla, R. (2021). A protection scheme for distribution utility grid with wind energy penetration. *Computers and Electrical Engineering*, *94*. Scopus. https://doi.org/10.1016/j.compeleceng.2021.107324 12
Budge, S., Hutchings, P., Parker, A., Tyrrel, S., Norton, S., Garbutt, C., Woldemedhin, F., Jemal, M. Y., Moges, M., Hussen, S., & Beyene, H. (2021). A randomised controlled feasibility trial of a babywash household playspace: The campi study. PLoS Neglected Tropical Diseases, 15(7). Scopus. https://doi.org/10.1371/journal.pntd.0009514 13

Zeleke, M. A., & Ageze, M. B. (2021). A Review of Peridynamics (PD) Theory of Diffusion Based Problems. *Journal of Engineering (United Kingdom)*, 2021. Scopus. https://doi.org/10.1155/2021/7782326 14 Gelaye, G., Sandip, B., & Mestawet, T. (2021). A REVIEW ON SOME FACTORS AFFECTING WOOL QUALITY PARAMETERS OF SHEEP. *African Journal of Food, Agriculture, Nutrition and Development*, 21(105), 18980–18999. Scopus. https://doi.org/10.18697/AJFAND.105.19330 14

Kassa, Z. Y., & Hadra, N. (2021). A systematic review and meta-analysis on women's knowledge of preconception care. *Ethiopian Journal of Reproductive Health*, *13*(2), 1–8. Scopus. 15

Regasa, D. G., Diro, B. A., Tadesse, E. D., & Buta, M. N. (2021). Access to financial services and innovation: Firm-level data for Ethiopia. *Innovation and Development*, *11*(1), 119–134. Scopus. https://doi.org/10.1080/2157930X.2020.1798070 16

Tesfaye, T., Woldesemayat, E. M., Chea, N., & Wachamo, D. (2021). Accessing healthcare services for people with physical disabilities in Hawassa city administration, Ethiopia: A cross-sectional study. *Risk Management and Healthcare Policy*, *14*, 3993–4002. Scopus. https://doi.org/10.2147/RMHP.S317849

Bekala, D., Reda, D. Y., & Ali, M. M. (2021). Acid-fast bacilli positivity rate and associated factors among leprosy suspected cases attending selected health facilities located in West Arsi Zone, Oromia, Ethiopia. *Infection and Drug Resistance*, *14*, 4581–4589. Scopus. https://doi.org/10.2147/IDR.S339102 17

Deyno, S., Tola, M. A., Bazira, J., Makonnen, E., & Alele, P. E. (2021). Acute and repeated-dose toxicity of Echinops kebericho Mesfin essential oil. *Toxicology Reports*, *8*, 131–138. Scopus. https://doi.org/10.1016/j.toxrep.2020.12.027

Rike, M., Loha, E., & Kassa, A. (2021). Adherence to Antiretroviral Treatment among Adult People Living with HIV/AIDS Attending Highly Active Antiretroviral Therapy at Adare Hospital, Southern Ethiopia. *Ethiopian Journal of Health Development*, *35*(2), 1–11. Scopus. 19

Urgessa Waktola, T., & Fekadu, K. (2021). Adoption of Coffee Shade Agroforestry Technology and Shade Tree Management in Gobu Seyo District, East Wollega, Oromia. *Advances in Agriculture*, 2021. Scopus. https://doi.org/10.1155/2021/8574214 20

iii

T, K. (2021). Adoption Of Garden Coffee Production Technology Package By Smallholder
Farmers In Ethiopia. African Journal of Food, Agriculture, Nutrition and Development, 21(5),
17989–18004. Scopus. https://doi.org/10.18697/ajfand.100.19990
21

Mulatu, A., Marisennayya, S., & Bojago, E. (2021). Adoption of Modern Hive Beekeeping
Technology: The Case of Kacha-Birra Woreda, Kembata Tembaro Zone, Southern Ethiopia. *Advances in Agriculture*, 2021. Scopus. https://doi.org/10.1155/2021/4714020
22

Kara, H. T., Anshebo, S. T., & Sabir, F. K. (2021). Adsorptive Removal of Cd(II) Ions from Wastewater Using Maleic Anhydride Nanocellulose. *Journal of Nanotechnology*, 2021. Scopus. https://doi.org/10.1155/2021/9966811
23

Wang, Z., Zhang, B., Mobtahej, M., Baziar, A., & Khan, B. (2021). Advanced Reactive Power
Compensation of Wind Power Plant Using PMU Data. *IEEE Access*, *9*, 67006–67014. Scopus.
https://doi.org/10.1109/ACCESS.2021.3075966
23

Dibabi, M. M., Debiso, A. T., & Rodamo, K. M. (2021). Adverse maternal outcomes associated with Cesarean deliveries and their determinants: Hospital based cross sectional, mixed- methods study. *Journal of Health Research*. Scopus. https://doi.org/10.1108/JHR-09-2020-0396 24

Tafesse, D., Nallamothu, R. B., Nallamothu, A. K., Nallamothu, S. K., Gezu, L., & Eromo, B.
(2021). Aerodynamic Analysis of Body of Passenger Bus for CO2 Reduction and Fuel Saving (p. 119). Scopus. https://doi.org/10.1007/978-981-16-0976-3\_11
25

Eshete, M., Gebremedhin, S., Alemayehu, F. R., Taye, M., Boshe, B., & Stoecker, B. J. (2021).
Aflatoxin contamination of human breast milk and complementary foods in southern Ethiopia. *Maternal and Child Nutrition*, 17(1). Scopus. https://doi.org/10.1111/mcn.13081 26

Worku, W., Temeche, D., Gossa, R., & Abate, B. (2021). Agronomic management options to enhance adoption of maize–common bean–common bean sequential intercropping in southern Ethiopia. *Journal of Crop Science and Biotechnology*, 24(3), 307–318. Scopus. https://doi.org/10.1007/s12892-020-00078-x 27

Ewunie, G. A., Morken, J., & Yigezu, Z. D. (2021). Alkaline and co-digestion pretreatments: Process optimization for enhancing the methane yield of Jatropha press cake. *Biomass Conversion and Biorefinery*, *11*(3), 971–988. Scopus. https://doi.org/10.1007/s13399-020-00732-y 27

Getnet, D., & Negash, M. (2021). Allometric equations for estimating aboveground biomass of khat (Catha edulis)-stimulate grown in agroforestry of Raya Valley, Northern Ethiopia. *Heliyon*, 7(1). Scopus. https://doi.org/10.1016/j.heliyon.2020.e05839 28

Mahela, O. P., Sharma, J., Kumar, B., Khan, B., & Alhelou, H. H. (2021). An algorithm for the protection of distribution feeders using the Stockwell and Hilbert transforms supported features. *CSEE Journal of Power and Energy Systems*, 7(6), 1278–1288. Scopus.
https://doi.org/10.17775/CSEEJPES.2020.00170 29

Zeinoddini-Meymand, H., Kamel, S., & Khan, B. (2021). An Efficient Approach with Application of Linear and Nonlinear Models for Evaluation of Power Transformer Health Index. *IEEE Access*, *9*, 150172–150186. Scopus. https://doi.org/10.1109/ACCESS.2021.3124845 30

Daniel, J. J., Basoro, D., & Gebrie, M. (2021). An engineered alternative brick masonry unit for the poor inhabitants at hawassa village, ethiopia. *International Journal of Advanced Technology and Engineering Exploration*, 8(79), 717–734. Scopus. https://doi.org/10.19101/IJATEE.2021.874128 31

Sathish, T., Tharmalingam, S., Mohanavel, V., Ashraff Ali, K. S., Karthick, A., Ravichandran, M., & Rajkumar, S. (2021). Weldability Investigation and Optimization of Process Variables for TIG-Welded Aluminium Alloy (AA 8006). *Advances in Materials Science and Engineering*, 2021.
Scopus. https://doi.org/10.1155/2021/2816338\_Conference Paper 32

Ashraff Ali, K. S., Suresh Kumar, S., Allen Jeffrey, J., Ravikumar, M. M., & Rajkumar, S. (2021). An insight into stress and strain analysis over on hexagonal aluminium sandwich honeycomb with various thickness glass fiber face sheets. 47, 493–499. Scopus. https://doi.org/10.1016/j.matpr.2021.05.038 32

Vijayan, D. S., & Daniel, J. J. (2021). An investigation on the torsional effect of symmetric moment resisting frame system subjected to eccentric reinforced concrete lift wall—A finite element approach. *International Journal of Engineering Trends and Technology*, 69(8), 179–184.
Scopus.

Sarathchandra, C., Abebe, Y. A., Wijerathne, I. L., Aluthwattha, S. T., Wickramasinghe, S., & Ouyang, Z. (2021). An overview of ecosystem service studies in a tropical biodiversity hotspot, Sri Lanka: Key perspectives for future research. *Forests*, *12*(5). Scopus. https://doi.org/10.3390/f12050540 34

Ramkumar, G., Sahoo, S., Anitha, G., Ramesh, S., Nirmala, P., Tamilselvi, M., Subbiah, R., & Rajkumar, S. (2021). An Unconventional Approach for Analyzing the Mechanical Properties of Natural Fiber Composite Using Convolutional Neural Network. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/5450935 34

Khan, B., Tesfaye, M., Mahela, O. P., Alhelou, H. H., Gupta, N., Khosravy, M., Senjyu, T., & Guerrero, J. M. (2021). Analysing integration issues of the microgrid system with utility grid network. *International Journal of Emerging Electric Power Systems*, 22(1), 113–127. Scopus. https://doi.org/10.1515/ijeeps-2020-0170 35

Senthilnathan, K., Ravi, R., Stephen Leon, J., Suresh, G., Manikandan, K., & Lavanya, R. (2021). Analysing the effect of mechanical properties of various proportions of filler material on jute fibre/epoxy reinforced composites. 1921(1). Scopus. https://doi.org/10.1088/1742-6596/1921/1/012089\_Conference Paper 36

Zigene, Z. D., Asfaw, B. T., & Bitima, T. D. (2021). Analysis of genetic diversity in rosemary (Salvia rosemarinus Schleid.) using SSR molecular marker for its management and sustainable use in Ethiopian genebank. *Genetic Resources and Crop Evolution*, 68(1), 279–293. Scopus. https://doi.org/10.1007/s10722-020-00984-7 37

Wassie, Y. T., & Adaramola, M. S. (2021a). Analysis of potential fuel savings, economic and environmental effects of improved biomass cookstoves in rural Ethiopia. *Journal of Cleaner Production*, 280. Scopus. https://doi.org/10.1016/j.jclepro.2020.124700
38

Tilahun, S., Paramasivam, V., Tufa, M., Kerebih, A., & Selvaraj, S. K. (2021). *Analytical investigation of Pelton turbine for mini hydro power: For the case of selected site in Ethiopia.* 46, 7364–7368. Scopus. https://doi.org/10.1016/j.matpr.2020.12.1038\_Conference 38

Kinyoki, D., Osgood-Zimmerman, A. E., Bhattacharjee, N. V., Schaeffer, L. E., Lazzar-Atwood,
A., Lu, D., Ewald, S. B., Donkers, K. M., Letourneau, I. D., Collison, M., Schipp, M. F., Abajobir,
A., Abbasi, S., Abbasi, N., Abbasifard, M., Abbasi-Kangevari, M., Abbastabar, H., Abd-Allah, F.,
Abdelalim, A., ... Hay, S. I. (2021). Anemia prevalence in women of reproductive age in low- and
middle-income countries between 2000 and 2018. *Nature Medicine*, *27*(10), 1761–1782. Scopus.
https://doi.org/10.1038/s41591-021-01498-0

Lire, T., Megerssa, B., Asefa, Y., & Hirigo, A. T. (2021). Antenatal care service satisfaction andits associated factors among pregnant women in public health centres in Hawassa city, SouthernEthiopia.Proceedings of Singapore Healthcare.Scopus.https://doi.org/10.1177/2010105821100788140

Deyno, S., Mtewa, A. G., Hope, D., Bazira, J., Makonnen, E., & Alele, P. E. (2021). Antibacterial Activities of Echinops kebericho Mesfin Tuber Extracts and Isolation of the Most Active

Compound, Dehydrocostus Lactone. *Frontiers in Pharmacology*, 11. Scopus. https://doi.org/10.3389/fphar.2020.608672 41

Dagne, E., Dobo, B., & Bedewi, Z. (2021). Antibacterial Activity of Papaya (Carica papaya) Leaf and Seed Extracts Against Some Selected Gram-Positive and Gram- Negative Bacteria. *Pharmacognosy Journal*, *13*(6), 1727–1733. Scopus. https://doi.org/10.5530/pj.2021.13.223 42 Bekele, E. K., Nosworthy, M. G., Tyler, R. T., & Henry, C. J. (2021). Antioxidant capacity and total phenolics content of direct-expanded chickpea–sorghum snacks. *Journal of Food Processing and Preservation*, *45*(5). Scopus. https://doi.org/10.1111/jfpp.15439 43

Takele, A., Melesse, A., & Taye, M. (2021). APPLICATION OF MULTIVARIATE ANALYSISTO DIFFERENTIATE HARARGHE HIGHLAND GOAT POPULATIONS REARED IN THEWEST HARARGHE ZONE, ETHIOPIA. Chilean Journal of Agricultural and Animal Sciences,37(3), 209–220. Scopus. https://doi.org/10.29393/CHJAAS37-23AMAM3002344

Padmanaban, S., Dhanamjayulu, C., & Khan, B. (2021). Artificial Neural Network and Newton Raphson (ANN-NR) Algorithm Based Selective Harmonic Elimination in Cascaded Multilevel Inverter for PV Applications. *IEEE Access*, 9, 75058–75070. Scopus. https://doi.org/10.1109/ACCESS.2021.3081460
45

Padmanaban, S., Dhanamjayulu, C., & Khan, B. (2021). Artificial Neural Network and Newton Raphson (ANN-NR) Algorithm Based Selective Harmonic Elimination in Cascaded Multilevel Inverter for PV Applications. *IEEE Access*, 9, 75058–75070. Scopus. https://doi.org/10.1109/ACCESS.2021.3081460

Asfaw, B. T., Worojie, T. B., & Mengesha, W. A. (2021). Assessing morphological diversity in Ethiopian yams (Dioscorea spp.) and its correspondence with folk taxonomy. *Systematics and Biodiversity*, *19*(5), 471–487. Scopus. https://doi.org/10.1080/14772000.2021.1890269 46 Melesse, A., Tadele, A., Assefa, H., Taye, K., Kebede, T., Taye, M., & Betsha, S. (2021). Assessing the morphological diversity of ethiopian indigenous chickens using multivariate discriminant analysis of morphometric traits for sustainable utilization and conservation. *Poultry Science Journal*, *9*(1), 61–72. Scopus. https://doi.org/10.22069/psj.2021.18469.1644 47

Lencha, S. M., Tränckner, J., & Dananto, M. (2021). Assessing the water quality of lake hawassa Ethiopia—Trophic state and suitability for anthropogenic uses—Applying common water quality indices. *International Journal of Environmental Research and Public Health*, *18*(17). Scopus. https://doi.org/10.3390/ijerph18178904 48 Mosisa, A., Nurfeta, A., Bezabih, M., Tolera, A., Mengistu, S., Yigrem, S., & Hassen, A. (2021). Assessment of botanical composition, biomass yield, nutritional quality and methane production of forages in selected grasslands, southern highlands of Ethiopia. *Scientific African*, *12*. Scopus. https://doi.org/10.1016/j.sciaf.2021.e00726 49

Girmay, G., Moges, A., & Muluneh, A. (2021). Assessment of Current and Future Climate Change
Impact on Soil Loss Rate of Agewmariam Watershed, Northern Ethiopia. *Air, Soil and Water Research*, 14. Scopus. https://doi.org/10.1177/1178622121995847
50

Chikako, T. U., & Hamu, G. T. (2021). Assessment of Customers' Relationship Management Practices on Customer Retention and Loyalty of Oromia Credit and Saving Share Company: Bule Hora City Branch. *Advances in Operations Research*, 2021. Scopus. https://doi.org/10.1155/2021/5545836 51

Yasin, G., Elias, U., Walelign, W., & Hussein, M. (2021). Assessment of genetic diversity in cowpea (Vigna unguiculata) genotypes in Southern Ethiopia based on Morpho-Agronomic traits. *International Journal of Agricultural Technology*, *17*(4), 1631–1650. Scopus.

Berassa, M. S., Chiro, T. A., & Fanta, S. (2021). Assessment of job satisfaction among pharmacy professionals. *Journal of Pharmaceutical Policy and Practice*, *14*(1). Scopus. https://doi.org/10.1186/s40545-021-00356-1 52

Menjetta, T. (2021). Assessment of Knowledge, Attitude, and Practice towards Prevention and Control of Malaria in Halaba Town, Southern Ethiopia, 2017. *Journal of Tropical Medicine*, 2021. Scopus. https://doi.org/10.1155/2021/5665000 54

Debela, S. A., Sheriff, I., Debela, E. A., Sesay, M. T., Tolcha, A., & Tengbe, M. S. (2021). Assessment of Perceptions and Cancer Risks of Workers at a Polychlorinated Biphenyl-Contaminated Hotspot in Ethiopia. *Journal of Health and Pollution*, *11*(30), 1–19. Scopus. https://doi.org/10.5696/2156-9614-11.30.210609 55

Tewodros, A., Melese, L., & Yoseph, T. (2021). Assessment Of The Production And Importance Of Cowpea [Vigna Unguiculata (L.) Walp]: Cases From Selected Districts Of Southern Ethiopia. *African Journal of Food, Agriculture, Nutrition and Development, 21*(7), 18300–18318. Scopus. https://doi.org/10.18697/ajfand.102.19630 56

Kayamo, S. E. (2021). Asymmetric impact of real exchange rate on inflation in Ethiopia: A non-linearARDLapproach.CogentEconomicsandFinance,9(1).Scopus.https://doi.org/10.1080/23322039.2021.198693157

Subussa, B. W., Eshetu, T., Degefa, T., & Ali, M. M. (2021). Asymptomatic Plasmodium infection and associated factors among pregnant women in the Merti district, Oromia, Ethiopia. *PLoS ONE*, *16*(3 March). Scopus. https://doi.org/10.1371/journal.pone.0248074 58

Lemma, B., Ararso, K., & Evangelista, P. H. (2021). Attitude towards biogas technology, use and prospects for greenhouse gas emission reduction in southern Ethiopia. *Journal of Cleaner Production*, 283. Scopus. https://doi.org/10.1016/j.jclepro.2020.124608 59

Tiwari, V., Bapat, K., Shrimali, K. R., Singh, S. K., Tiwari, B., Jain, S., & Sharma, H. K. (2021). *Automatic Generation of Chest X-Ray Medical Imaging Reports using LSTM-CNN*. 80–85. Scopus. https://doi.org/10.1145/3484824.3484918 60

Gebre, A. B., Begashaw, T. A., & Ormago, M. D. (2021). Bacterial profile and drug susceptibility among adult patients with community acquired lower respiratory tract infection at tertiary hospital, Southern Ethiopia. *BMC Infectious Diseases*, *21*(1). Scopus. https://doi.org/10.1186/s12879-021-06151-2

Mechal, T., Hussen, S., & Desta, M. (2021). Bacterial profile, antibiotic susceptibility pattern and associated factors among patients attending adult OPD at Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia. *Infection and Drug Resistance*, *14*, 99–110. Scopus. https://doi.org/10.2147/IDR.S287374 61

Gebretsadik, A., Taddesse, F., Melaku, N., & Haji, Y. (2021). Balneotherapy for Musculoskeletal Pain Management of Hot Spring Water in Southern Ethiopia: Perceived Improvements. *Inquiry* (*United States*), 58. Scopus. https://doi.org/10.1177/00469580211049063 62

Bilal, S. M., Tadele, H., Abebo, T. A., Tadesse, B. T., Muleta, M., W/Gebriel, F., Alemayehu, A.,
Haji, Y., Kassa, D. H., Astatkie, A., Asefa, A., Teshome, M., Kawza, A., Wangoro, S., Brune, T.,
Singhal, N., Worku, B., & Aziz, K. (2021). Barriers for kangaroo mother care (KMC) acceptance,
and practices in southern Ethiopia: A model for scaling up uptake and adherence using qualitative
study. *BMC Pregnancy and Childbirth*, *21*(1). Scopus. https://doi.org/10.1186/s12884-020-034096

Chikako, T. U., Seidu, A.-A., Hagan, J. E., Aboagye, R. G., & Ahinkorah, B. O. (2021). Bayesian analysis of predictors of incomplete vaccination against polio among children aged 12–23 months in ethiopia. *International Journal of Environmental Research and Public Health*, *18*(22). Scopus. https://doi.org/10.3390/ijerph182211820 64 Delena, M. F., & Kayamo, S. E. (2021). Beekeeping opportunities, challenges and technology adoption in Gedeo Zone, Southern Ethiopia. *Journal of Apicultural Research*. Scopus. https://doi.org/10.1080/00218839.2021.1961429 65

Dessie, Y., Tadesse, S., Eswaramoorthy, R., & Abdisa, E. (2021). Bimetallic Mn–Ni oxide nanoparticles: Green synthesis, optimization and its low-cost anode modifier catalyst in microbial fuel cell. *Nano-Structures and Nano-Objects*, 25. Scopus. https://doi.org/10.1016/j.nanoso.2020.100663 66

Eba, K., Duchateau, L., Olkeba, B. K., Boets, P., Bedada, D., Goethals, P. L. M., Mereta, S. T., & Yewhalaw, D. (2021). Bio-control of anopheles mosquito larvae using invertebrate predators to support human health programs in Ethiopia. *International Journal of Environmental Research and Public Health*, *18*(4), 1–10. Scopus. https://doi.org/10.3390/ijerph18041810 67

Masresha, A. E., Skipperud, L., Rosseland, B. O., G.M, Z., Meland, S., & Salbu, B. (2021). Bioaccumulation of trace elements in liver and kidney of fish species from three freshwater lakes in the Ethiopian Rift Valley. *Environmental Monitoring and Assessment*, *193*(6). Scopus. https://doi.org/10.1007/s10661-021-09083-1 67

Tole, T. T., Diriba, E., & Bahiru, L. A. (2021). Bioactive compounds from Croton macrostachyus and Commiphora habessinica occurring in Ethiopia. *Advances in Traditional Medicine*. Scopus. https://doi.org/10.1007/s13596-021-00570-x 68

Ewunie, G. A., Yigezu, Z. D., & Morken, J. (2021). Biochemical methane potential of Jatropha curcas fruit shell: Comparative effect of mechanical, steam explosion and alkaline pretreatments. *Biomass Conversion and Biorefinery*. Scopus. https://doi.org/10.1007/s13399-020-01159-1
Gebremariam, S. N., & Marchetti, J. M. (2021a). Biodiesel production process using solid acid catalyst: Influence of market variables on the process's economic feasibility. *Biofuels, Bioproducts and Biorefining*, *15*(3), 815–824. Scopus. https://doi.org/10.1002/bbb.2203

Dessie, Y., Tadesse, S., Eswaramoorthy, R., & Adimasu, Y. (2021). Biosynthesized α-MnO2based polyaniline binary composite as efficient bioanode catalyst for high-performance microbial fuel cell. *All Life*, *14*(1), 541–568. Scopus. https://doi.org/10.1080/26895293.2021.1934123 70 Debelie, T. Z., Abdo, A. A., Anteneh, K. T., Limenih, M. A., Asaye, M. M., Aynalem, G. L., Ambaw, W. M., Kassie, B. A., & Abebe, S. M. (2021). Birth preparedness and complication readiness practice and associated factors among pregnant women in Northwest Ethiopia: 2018. *PLoS ONE*, *16*(4 April). Scopus. https://doi.org/10.1371/journal.pone.0249083 71 Nigussie Yirgu, A., Mohammed, K. H., Diriba, S. D., Babso, A. K., & Abdo, A. A. (2021). Blood donation and associated factors among employees working at negele arsi general hospital and medical college, southeast ethiopia: A cross-sectional study. *Journal of Blood Medicine*, *12*, 475–482. Scopus. https://doi.org/10.2147/JBM.S301826 72

Mekuria, S., Ashenafi, H., Kebede, N., Kassa, T., B Debella, D., Eyasu, T., Sheferaw, D., & Terefe, G. (2021). Bovine trypanosomosis in upstream and downstream of Ghibe-III hydroelectric dam:
Parasitological and entomological study, southern Ethiopia. *Veterinary Parasitology: Regional Studies and Reports*, 23. Scopus. https://doi.org/10.1016/j.vprsr.2020.100507

Belete, M. D., Hebart-Coleman, D., Mathews, R. E., & Zazu, C. (2021). Building foundations for source-to-sea management: The case of sediment management in the Lake Hawassa sub-basin of the Ethiopian Rift Valley. *Water International*, 46(2), 138–156. Scopus. https://doi.org/10.1080/02508060.2021.1889868
74

Muleta, A., Hailu, D., Stoecker, B. J., & Belachew, T. (2021). Camel milk consumption is associated with less childhood stunting and underweight than bovine milk in rural pastoral districts of Somali, Ethiopia: A cross-sectional study. *Journal of Nutritional Science*, *10*, 1–8. Scopus. https://doi.org/10.1017/jns.2021.75 75

Muleta, A., Hailu, D., & Belachew, T. (2021). Camel milk consumption was associated with lower prevalence of anemia among preschool children in rural pastoral districts of Somali, eastern Ethiopia. *Nutrition*, *86*. Scopus. https://doi.org/10.1016/j.nut.2021.111170 76

Abdelaal, N. E., Tanga, B. M., Abdelgawad, M., Allam, S., Fathi, M., Saadeldin, I. M., Bang, S., & Cho, J. (2021). Cellular therapy via spermatogonial stem cells for treating impaired spermatogenesis, non-obstructive azoospermia. *Cells*, *10*(7). Scopus. https://doi.org/10.3390/cells10071779 77

Kim, D.-G., Grieco, E., Bombelli, A., Hickman, J. E., & Sanz-Cobena, A. (2021). Challenges and opportunities for enhancing food security and greenhouse gas mitigation in smallholder farming in sub-Saharan Africa. A review. *Food Security*, *13*(2), 457–476. Scopus. https://doi.org/10.1007/s12571-021-01149-9

Zerssa, G., Feyssa, D., Kim, D.-G., & Eichler-Löbermann, B. (2021). Challenges of smallholder farming in Ethiopia and opportunities by adopting climate-smart agriculture. *Agriculture (Switzerland)*, *11*(3), 1–26. Scopus. https://doi.org/10.3390/agriculture11030192 79

Chulo, F., Laekemariam, F., & Kiflu, A. (2021). Changes in Soil Phosphorus Pools and Chemical Properties under Liming in Nitisols of Farawocha, South Ethiopia. *Applied and Environmental Soil Science*, 2021. Scopus. https://doi.org/10.1155/2021/5518545
79

Wegi, T., Hassen, A., Bezabih, M., & Tolera, A. (2021). Changes in vegetation structure, aboveground biomass and soil quality in response to traditional grazing land management practices in the central highlands of Ethiopia. *African Journal of Range and Forage Science*, *38*(S1), S52–S62. Scopus. https://doi.org/10.2989/10220119.2020.1815083 80

Abza, T., Tadesse, S., & Andoshe, D. M. (2021). Characterization of cds/zns and cds/cos multilayer thin films synthesized by chemical bath deposition. *International Journal of Thin Film Science and Technology*, *10*(1), 1–6. Scopus. https://doi.org/10.18576/ijtfst/100101 81

Ewunie, G. A., Lekang, O. I., Morken, J., & Yigezu, Z. D. (2021). Characterizing the potential and suitability of Ethiopian variety Jatropha curcas for biodiesel production: Variation in yield and physicochemical properties of oil across different growing areas. *Energy Reports*, *7*, 439–452. Scopus. https://doi.org/10.1016/j.egyr.2021.01.007 82

Tigistu, T., & Abebe, G. (2021). Classification of rose flowers based on Fourier descriptors and color moments. *Multimedia Tools and Applications*, 80(30), 36143–36157. Scopus. https://doi.org/10.1007/s11042-021-11397-8 83

Destaw, F., & Fenta, M. M. (2021a). Climate change adaptation strategies and their predictors amongst rural farmers in Ambassel district, Northern Ethiopia. *Jamba: Journal of Disaster Risk Studies*, *13*(1), 1–11. Scopus. https://doi.org/10.4102/JAMBA.V13I1.974 83

Mekonnen, A., Tessema, A., Ganewo, Z., & Haile, A. (2021a). Climate change impacts on household food security and adaptation strategies in southern Ethiopia. *Food and Energy Security*, *10*(1). Scopus. https://doi.org/10.1002/fes3.266 84

Mekonnen, A., Tessema, A., Ganewo, Z., & Haile, A. (2021b). Climate change impacts on household food security and farmers adaptation strategies. *Journal of Agriculture and Food Research*, 6. Scopus. https://doi.org/10.1016/j.jafr.2021.100197 85

Orsango, A. Z., Loha, E., Lindtjørn, B., & Engebretsen, I. M. S. (2021). Co-morbid anaemia and stunting among children 2-5 years old in southern Ethiopia: A community-based cross-sectional st 86

Dawed, M. Y., & Kebedow, K. G. (2021). Coexistence and harvesting optimal policy in three species food chain model with general Holling type functional response. *Natural Resource Modeling*, *34*(3). Scopus. https://doi.org/10.1111/nrm.12316 87

Yuan, G., Wang, H., Khazaei, E., & Khan, B. (2021). Collaborative advanced machine learning techniques in optimal energy management of hybrid AC/DC IoT-based microgrids. *Ad Hoc Networks*, *122*. Scopus. https://doi.org/10.1016/j.adhoc.2021.102657 87

Fiseha, S. B., Jara, G. M., Woldetsadik, E. A., Bekele, F. B., & Ali, M. M. (2021). Colonization rate of potential neonatal disease-causing bacteria, associated factors, and antimicrobial susceptibility profile among pregnant women attending government hospitals in hawassa, ethiopia. *Infection and Drug Resistance*, *14*, 3159–3168. Scopus. https://doi.org/10.2147/IDR.S326200 88 Zerssa, G. W., Kim, D.-G., Koal, P., & Eichler-Löbermann, B. (2021). Combination of compost and mineral fertilizers as an option for enhancing maize (Zea mays 1.) yields and mitigating greenhouse gas emissions from a nitisol in ethiopia. *Agronomy*, *11*(11). Scopus. https://doi.org/10.3390/agronomy11112097 90

Ali, M. A., Balcha, E. S., Woldesemayat, A. A., & Tirore, L. D. (2021). Combined assessment of tuberculosis case notification rate and infection control at health facilities of Dale districts, Sidama Zone, Southern Ethiopia. *PLoS ONE*, *16*(10 October). Scopus. https://doi.org/10.1371/journal.pone.0242446 91

Mekuria, S., Mekonnen, T. K., & Kebede, N. (2021). Community Perception on Trypanosomosis, Parasitological, and Entomological Studies in Two Selected Districts of South Omo Zone, Ethiopia. *Veterinary Medicine International*, 2021. Scopus. https://doi.org/10.1155/2021/8439698 92

Bante, A., Mersha, A., Zerdo, Z., Wassihun, B., & Yeheyis, T. (2021). Comorbid anxiety and depression: Prevalence and associated factors among pregnant women in Arba Minch zuria district, Gamo zone, southern Ethiopia. *PLoS ONE*, *16*(3 March). Scopus. https://doi.org/10.1371/journal.pone.0248331 93

Gebre, A., Shaikh, J., Kebede, T., & Gelete, F. Z. (2021). Comparative Performance Analysis of Channel Estimation Techniques for Massive MIMO System. 236–239. Scopus. https://doi.org/10.1109/InCAP52216.2021.9726282 94

Getahun, A. M., Hunderra, G. C., Gebrezihar, T. G., Boru, B. G., Desta, N. T., & Ayana, T. D. (2021). Comparative study on lesions of reproductive disorders of cows and female dromedary

camels slaughtered at Addis Ababa, Adama and Akaki abattoirs with bacterial isolation and characterization. *BMC Veterinary Research*, *17*(1). Scopus. https://doi.org/10.1186/s12917-021-02822-z 95

Enyew, B. Y., & Asfaw, Z. G. (2021). Comparison of survival models and assessment of risk factors for survival of cardiovascular patients at addis ababa cardiac center, ethiopia: A retrospective study. *African Health Sciences*, *21*(3), 1201–1213. Scopus. https://doi.org/10.4314/ahs.v21i3.29 96

Ruiz, L., Alba, C., García-Carral, C., Jiménez, E. A., Lackey, K. A., McGuire, M. K., Meehan, C.
L., Foster, J., Sellen, D. W., Kamau-Mbuthia, E. W., Kamundia, E. W., Mbugua, S., Moore, S. E.,
Prentice, A. M., Gindola K, D., Otoo, G. E., Pareja, R. G., Bode, L., McGuire, M. A., ...
Rodríguez, J. M. (2021). Comparison of Two Approaches for the Metataxonomic Analysis of the
Human Milk Microbiome. *Frontiers in Cellular and Infection Microbiology*, *11*. Scopus.
https://doi.org/10.3389/fcimb.2021.622550

Chikako, T. U., Seidu, A.-A., Hagan, J. E., & Ahinkorah, B. O. (2021). Complex multilevel modelling of the individual, household and regional level variability in predictors of undernutrition among children aged 6–59 months in ethiopia. *Nutrients*, *13*(9). Scopus. https://doi.org/10.3390/nu13093018 98

Ramadoss, J., Venkatesh, J., Joshi, S., Shukla, P. K., Jamal, S. S., Altuwairiqi, M., & Tiwari, B.
(2021). Computer Vision for Human-Computer Interaction Using Noninvasive Technology. *Scientific Programming*, 2021. Scopus. https://doi.org/10.1155/2021/3902030
99

Amare, H. H., & Lindtjorn, B. (2021a). Concurrent anemia and stunting among schoolchildren in
Wonago district in southern Ethiopia: A cross-sectional multilevel analysis. *PeerJ*, 9. Scopus.
https://doi.org/10.7717/peerj.11158

Zenebe, M. H., Mekonnen, Z., Loha, E., & Padalko, E. (2021a). Congenital Cytomegalovirus Infections Mother-Newborn Pair Study in Southern Ethiopia. *Canadian Journal of Infectious Diseases and Medical Microbiology*, 2021. Scopus. https://doi.org/10.1155/2021/4646743 101

Yeshaneh, A., Lencha, A., Aweke, A. M., Dessalew, Y., Wale, T., Mekuriya, E., Abdulahi, T.,
Workineh, A., Yitayew, M., Dinku, H., & Asfaw, G. (2021). Consistent condom utilization and associated factors among HIV positive clients attending ART clinic at Pawi general hospital, North
West Ethiopia. PLoS ONE, 16(12 December). Scopus.
https://doi.org/10.1371/journal.pone.0261581 102

Haji, B., & Workagegn, K. B. (2021). Constraints hindering small scale aquaculture production insouthernEthiopia.AquacultureInternational,29(2),565–574.Scopus.https://doi.org/10.1007/s10499-020-00641-x103

Astatkie, H., Ambelu, A., & Mengistie, E. (2021). Contamination of Stream Sediment With Heavy Metals in the Awetu Watershed of Southwestern Ethiopia. *Frontiers in Earth Science*, 9. Scopus. https://doi.org/10.3389/feart.2021.658737 104

Dadi, T. L., Medhin, G., Kasaye, H. K., Kassie, G. M., Jebena, M. G., Gobezie, W. A., Alemayehu, Y. K., & Teklu, A. M. (2021). Continuum of maternity care among rural women in Ethiopia: Does place and frequency of antenatal care visit matter? *Reproductive Health*, *18*(1). Scopus. https://doi.org/10.1186/s12978-021-01265-x 105

Belay, M. H., Beshir, H. M., Terfa, M. T., & Roro, A. G. (2021). Control of growth and flowering of chrysanthemum (Dendranthema x grandiflorum Kitam.) using day length extension and Red Light Night Break. *Ornamental Horticulture*, 27(3), 365–373. Scopus. https://doi.org/10.1590/2447-536X.v27i3.2338 106

Bedaso, A., Adams, J., Peng, W., & Sibbritt, D. (2021a). Correction to: Prevalence and determinants of low social support during pregnancy among Australian women: A community-based cross-sectional study (Reproductive Health, (2021), 18, 1, (158), 10.1186/s12978-021-01210-y). *Reproductive Health*, *18*(1). Scopus. https://doi.org/10.1186/s12978-021-01231-7 107 Gifty, A. G., De Meulenaer, B., & Olango, T. M. (2021). Corrigendum to "Variation in tuber proximate composition, sugars, fatty acids and amino acids of eight Oromo dinich (Plectranthus edulis) landraces experimentally grown in Ethiopia" [J. Food Compos. Anal. 67 (2018) 191–200](S0889157518300152)(10.1016/j.jfca.2018.01.015). *Journal of Food Composition and Analysis, 101*. Scopus. https://doi.org/10.1016/j.jfca.2021.103951 107

Woldesemayat, E. M. (2021a). Cost-effectiveness of follow-up of chronic coughers in detecting smear-positive tuberculosis in South Ethiopia. *ClinicoEconomics and Outcomes Research*, *13*, 737–744. Scopus. https://doi.org/10.2147/CEOR.S319588 108

Wondirad, A., Kebete, Y., & Li, Y. (2021). Culinary tourism as a driver of regional economic development and socio-cultural revitalization: Evidence from Amhara National Regional State, Ethiopia. *Journal of Destination Marketing and Management*, 19. Scopus. https://doi.org/10.1016/j.jdmm.2020.100482

Worojie, T. B., Asfaw, B. T., & Mengesha, W. A. (2021a). Cultivation and possible domestication of feral and possibly wild yams (Dioscorea spp.) in Southwest Ethiopia: Ethnobotanical and morphological evidence. *Plant Signaling and Behavior*, *16*(5). Scopus. https://doi.org/10.1080/15592324.2021.1879531

Jikamo, B., Adefris, M., Azale, T., & Alemu, K. (2021). Cultural adaptation and validation of the Sidamic version of the World Health Organization Quality-of-Life-Bref Scale measuring the quality of life of women with severe preeclampsia in southern Ethiopia, 2020. *Health and Quality of Life Outcomes*, *19*(1). Scopus. https://doi.org/10.1186/s12955-021-01872-z 111

Desta, H. B., & Belayneh, M. Z. (2021). Dam breach analysis: A case of Gidabo dam, Southern Ethiopia. *International Journal of Environmental Science and Technology*, *18*(1), 107–122. Scopus. https://doi.org/10.1007/s13762-020-03008-0 112

Balan, G. S., Sridharan, M., Balasundaram, R., Sasikaran, A., Sagar, M., Dinesh, S., Vijayan, V., & Rajkumar, S. (2021). Degradation Analysis of Jute Fiber Reinforced Waste Tile Powder-Filled
Polymer Composite on Wear Characteristics. *International Journal of Polymer Science*, 2021.
Scopus. https://doi.org/10.1155/2021/8587383

Gezu, L., Nallamothu, R. B., Nallamothu, S. K., Nallamothu, A. K., & Tafesse, D. (2021). *Design* and Analysis of Composite Drive Shaft for Rear-Wheel-Drive Vehicle (p. 92). Scopus. https://doi.org/10.1007/978-981-16-0976-3\_9

Kakkar, S., Maity, T., Ahuja, R. K., Walde, P., Saket, R. K., Khan, B., & Padmanaban, S. (2021).
Design and Control of Grid-Connected PWM Rectifiers by Optimizing Fractional Order PI Controller Using Water Cycle Algorithm. *IEEE Access*, *9*, 125941–125954. Scopus. https://doi.org/10.1109/ACCESS.2021.3110431

Chiriko, A. Y., Muluneh, D. W., & Taye, T. T. (2021). DESTINATION COMPETITIVENESSIN A TOURIST ROUTE CONTEXT: TOUR OPERATORS' PERSPECTIVE. Tourism, CultureandCommunication,21(4),299–311.Scopus.https://doi.org/10.3727/109830421X16257465701936115

Daba, A. K., Murimi, M., Abegaz, K., & Hailu, D. (2021). Determinants and constraints to household-level animal source food consumption in rural communities of Ethiopia. *Journal of Nutritional Science*, *10*, e58. Scopus. https://doi.org/10.1017/jns.2021.52

Roba Gamo, B., Woldeamanuel Habebo, T., Tsegaye Mekonnen, G., & Park, D.-B. (2021). Determinants of community participation in a watershed development program in Southern Ethiopia. *Community Development*. Scopus. https://doi.org/10.1080/15575330.2021.1946576117 Wassie, Y. T., Rannestad, M. M., & Adaramola, M. S. (2021). Determinants of household energy choices in rural sub-Saharan Africa: An example from southern Ethiopia. *Energy*, 221. Scopus. https://doi.org/10.1016/j.energy.2021.119785

Kotiso, K. S., Degemu, N., Gebremedhin, S., Taye, M., Petros, A., Belayneh, F., Wolde, D., & Hailu, D. (2021). Determinants of hypertension among patients with type 2 diabetes mellitus on follow-up at Tikur Anbessa Specialized Hospital, Addis Ababa: A case-control study. *PLoS ONE*, *16*(8 August). Scopus. https://doi.org/10.1371/journal.pone.0256399

Alemu, A. (2021). Determinants of Participation in Farmers Training Centre Based ExtensionTraining in Ethiopia. Journal of Agricultural Extension, 25(2), 86–95. Scopus.https://doi.org/10.4314/jae.v25i2.8119

Belayhun, Y., Kassa, Y., Mekonnen, N., Binu, W., Tenga, M., & Duko, B. (2021). Determinants of Pregnancy-Induced Hypertension among Mothers Attending Public Hospitals in Wolaita Zone, South Ethiopia: Findings from Unmatched Case-Control Study. *International Journal of Hypertension*, 2021. Scopus. https://doi.org/10.1155/2021/6947499
120

Tegegn, A., Pendell, D. L., Tolera, A., Min, D., Vipham, J., & Mekasha, A. (2021). DETERMINANTS OF SORGHUM BIOMASS USE FOR LIVESTOCK FEED ACROSS SORGHUM GROWING AGROECOLOGICAL ZONES IN ETHIOPIA. *Tropical and Subtropical Agroecosystems*, 24(3). Scopus. https://www.scopus.com/inward/record.uri?eid=2s2.0-85126533285&partnerID=40&md5=446104ae3bd42ee4709fe05026d5b116 121 Pachauri, R. K., Mahela, O. P., Khan, B., Kumar, A., Agarwal, S., Alhelou, H. H., & Bai, J. (2021). Development of arduino assisted data acquisition system for solar photovoltaic array

characterization under partial shading conditions. Computers and Electrical Engineering, 92.Scopus. https://doi.org/10.1016/j.compeleceng.2021.107175122

Sivasuriyan, A., Vijayan, D. S., Leemarose, A., Revathy, J., Gayathri Monicka, S., Adithya, U. R., & Jebasingh Daniel, J. (2021). Development of Smart Sensing Technology Approaches in Structural Health Monitoring of Bridge Structures. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/2615029 122

Paidar, M., Mohanavel, V., Ojo, O. O., Mehrez, S., Rajkumar, S., & Ravichandran, M. (2021).
Dieless Friction Stir Extrusion-Brazing (DFSE-B) of AA2024-T3 aluminum alloy to Copper with Zn interlayer. *Results in Physics*, 24. Scopus. https://doi.org/10.1016/j.rinp.2021.104101
de Roo, N., Amede, T., Elias, E., Almekinders, C., & Leeuwis, C. (2021). Diffusion of agricultural knowledge in Southern Ethiopia: Finding the real opinion leaders through network analysis. *Journal of Agricultural Education and Extension*. Scopus.
https://doi.org/10.1080/1389224X.2021.1987282

Sheferaw, D., Mohammed, A., & Degefu, A. (2021). Distribution and prevalence of gastrointestinal tract nematodes of sheep at highland and midland areas, Ethiopia. *Journal of Parasitic Diseases*, *45*(4), 995–1001. Scopus. https://doi.org/10.1007/s12639-021-01397-8 125 Elende, A. A., & Gebremichael, M. G. (2021). Distribution Network Optimization by Optimal Sizing and Placement of D-STATCOM using Teaching and Learning Based Optimization Algorithm. 2021 IEEE Southern Power Electronics Conference, SPEC 2021. Scopus. https://doi.org/10.1109/SPEC52827.2021.9709447 125

Anteneh, D., Khan, B., Mahela, O. P., Alhelou, H. H., & Guerrero, J. M. (2021). Distributionnetwork reliability enhancement and power loss reduction by optimal network reconfiguration.*Computers*and*ElectricalEngineering*,96.Scopus.https://doi.org/10.1016/j.compeleceng.2021.107518126

Deng, L., Peng, C., Kim, D.-G., Li, J., Liu, Y., Hai, X., Liu, Q., Huang, C., Shangguan, Z., & Kuzyakov, Y. (2021). Drought effects on soil carbon and nitrogen dynamics in global natural ecosystems. *Earth-Science Reviews*, *214*. Scopus. https://doi.org/10.1016/j.earscirev.2020.103501 127

Endris, J., & Govindan, N. (2021). Dyeing and finishing of cotton fabric with eucalyptus leaves extracts. *Research Journal of Textile and Apparel*, 25(3), 193–208. Scopus. https://doi.org/10.1108/RJTA-12-2019-0060 128

Semela, T., & Miethe, I. (2021). East Germany in the Horn of Africa: Reflections on the GDR's educational intervention in Ethiopia, c. 1977–1989. *History of Education*, *50*(5), 663–684. Scopus. https://doi.org/10.1080/0046760X.2021.1884753 129

Bona, L. G., Geleta, D., Dulla, D., Deribe, B., Ayalew, M., Ababi, G., Bogale, N., Mengistu, K., Gadissa, A., & Gebretsadik, A. (2021). Economic Burden of Cancer on Cancer Patients Treated at

Hawassa University Comprehensive Specialized Hospital. Cancer Control, 28. Scopus.https://doi.org/10.1177/10732748211009252129

Tefera, D. A., & Bijman, J. (2021). Economics of contracts in African food systems: Evidence from the malt barley sector in Ethiopia. *Agricultural and Food Economics*, 9(1). Scopus. https://doi.org/10.1186/s40100-021-00198-0 130

Kinati, C., Ameha, N., Girma, M., & Nurfeta, A. (2021). Efective microorganisms, turmeric (Curcuma longa) as feed additiveson production performance and sensory evaluation of eggs fromWhite Leghorn hens. *Livestock Research for Rural Development*, *33*(1). Scopus. https://www.scopus.com/inward/record.uri?eid=2-s2.0-

85100171748&partnerID=40&md5=a00047e6e5add3cb784021268a557f55 131

Haji, Y., Taddesse, F., Serka, S., & Gebretsadik, A. (2021). Effect of balneotherapy on chronic low back pain at hot springs in southern ethiopia: Perceived improvements from pain. Journal of Pain Research, 14, 2491–2500. Scopus. https://doi.org/10.2147/JPR.S322603 131 Wakjira, C. K., Zeleke, N. A., Abebe, M. G., & Abeshu, A. N. (2021). Effect of Beneficial Microorganisms, Turmeric (Curcuma Longa), and Their Combination as Feed Additives on Fertility, Hatchability, and Chick Quality Parameters of White Leghorn Layers. Journal of World's Poultry Research, 11(3), 359–367. Scopus. https://doi.org/10.36380/JWPR.2021.43 132 Kindeya, F., Hailu, W., Dessalegn, T., & L Kibr, G. (2021). Effect of blending ratio of wheat, orange fleshed sweet potato (Ipomoea batatas L.) powder and haricot bean (Phaseolus vulgarisL.) flour on proximate composition, physical properties and sensory acceptability of biscuits. F1000Research, 10, 506. Scopus. https://doi.org/10.12688/f1000research.52634.1 133 Tamasgen, N., Urge, M., Girma, M., & Nurfeta, A. (2021). Effect of dietary replacement of soybean meal with linseed meal on feed intake, growth performance and carcass quality of broilers. Heliyon, 7(11). Scopus. https://doi.org/10.1016/j.heliyon.2021.e08297 134 Muluneh, M. G., Feyissa, M. T., & Wolde, T. M. (2021). Effect of forest fragmentation and disturbance on diversity and structure of woody species in dry Afromontane forests of northern

 Ethiopia.
 Biodiversity
 and
 Conservation,
 30(6),
 1753–1779.
 Scopus.

 https://doi.org/10.1007/s10531-021-02167-x
 135

Terefe, Z. K., Omwamba, M. N., & Nduko, J. M. (2021). Effect of solid state fermentation on proximate composition, antinutritional factors and in vitro protein digestibility of maize flour. *Food Science and Nutrition*, *9*(11), 6343–6352. Scopus. https://doi.org/10.1002/fsn3.2599 136

Tesfaye, B., Ermias, D., Moges, S., & Astatkie, A. (2021). Effect of the test and treat strategy on mortality among hiv-positive adult clients on antiretroviral treatment in public hospitals of Addis Ababa, Ethiopia. *HIV/AIDS - Research and Palliative Care*, *13*, 349–360. Scopus. https://doi.org/10.2147/HIV.S303557

Gupta, A. K., Pachauri, R. K., Maity, T., Chauhan, Y. K., Mahela, O. P., Khan, B., & Gupta, P. K. (2021). Effect of Various Incremental Conductance MPPT Methods on the Charging of Battery Load Feed by Solar Panel. *IEEE Access*, *9*, 90977–90988. Scopus. https://doi.org/10.1109/ACCESS.2021.3091502 138

Genanaw, W., Kanno, G. G., Derese, D., & Aregu, M. B. (2021). Effect of Wastewater Discharge From Coffee Processing Plant on River Water Quality, Sidama Region, South Ethiopia. *Environmental Health Insights*, *15*. Scopus. https://doi.org/10.1177/11786302211061047 138 Mezgebe, A., & Azerefegne, F. (2021). Effect of water stress on glucosinolate content of Brassica carinata and performance of Brevicoryne brassicae and Myzus persicae. *International Journal of Tropical Insect Science*, *41*(2), 953–960. Scopus. https://doi.org/10.1007/s42690-020-00340-3 139

Alam, M.-U., Ferdous, S., Ercumen, A., Lin, A., Kamal, A., Luies, S. K., Sharior, F., Khan, R., Rahman, M. Z., Parvez, S. M., Amin, N., Tadesse, B. T., Moushomi, N. A., Hasan, R., Taneja, N., Islam, M. A., & Rahman, M. (2021). Effective treatment strategies for the removal of antibioticresistant bacteria, antibiotic-resistance genes, and antibiotic residues in the effluent from wastewater treatment plants receiving municipal, hospital, and domestic wastewater: Protocol for a systematic review. *JMIR Research Protocols*, *10*(11). Scopus. https://doi.org/10.2196/33365 140

Sileshi, G., Mitiku, E., Mengistu, U., Adugna, T., & Fekede, F. (2021). Effects of Dietary Energy and Protein Levels on Nutrient Intake, Digestibility, and Body Weight Change in Hararghe Highland and Afar Sheep Breeds of Ethiopia. *Journal of Advanced Veterinary and Animal Research*, 8(2), 185–194. Scopus. https://doi.org/10.5455/javar.2021.h501 141 Keneni, Y. G., Bahiru, L. A., & Marchetti, J. M. (2021). Effects of Different Extraction Solvents on Oil Extracted from Jatropha Seeds and the Potential of Seed Residues as a Heat Provider. *Bioenergy Research*, 14(4), 1207–1222. Scopus. https://doi.org/10.1007/s12155-020-10217-5142 Abera, G., & Gerkabo, H. (2021). Effects of green manure legumes and their termination time on yield of maize and soil chemical properties. *Archives of Agronomy and Soil Science*, 67(3), 397–409. Scopus. https://doi.org/10.1080/03650340.2020.1733536 143

Assefa, S., Haile, W., & Tena, W. (2021a). Effects of phosphorus and sulfur on yield and nutrient uptake of wheat (Triticum aestivum L.) on Vertisols, North Central, Ethiopia. *Heliyon*, 7(3). Scopus. https://doi.org/10.1016/j.heliyon.2021.e06614 144

BORZOUEI, A., MANDER, U., TEEMUSK, A., SANZ-COBENA, A., ZAMAN, M., KIM, D.-G., MULLER, C., KELESTANIE, A. A., AMIN, P. S., MOGHISEH, E., DAWAR, K., & PÉREZ-CASTILLO, A. G. (2021). Effects of the nitrification inhibitor nitrapyrin and tillage practices on yield-scaled nitrous oxide emission from a maize field in Iran. *Pedosphere*, *31*(2), 314–322. Scopus. https://doi.org/10.1016/S1002-0160(20)60067-4

MOONIS, M., LEE, J.-K., JIN, H., KIM, D.-G., & PARK, J.-H. (2021). Effects of warming, wetting and nitrogen addition on substrate-induced respiration and temperature sensitivity of heterotrophic respiration in a temperate forest soil. *Pedosphere*, *31*(2), 363–372. Scopus. https://doi.org/10.1016/S1002-0160(20)60069-8 146

Mulualem, D., Hailu, D., Tessema, M., & Whiting, S. J. (2021). Efficacy of calcium-containing eggshell powder supplementation on urinary fluoride and fluorosis symptoms in women in the ethiopian rift valley. Nutrients, 13(4). Scopus. https://doi.org/10.3390/nu13041052 147 Wolde, S., Mirkena, T., Melesse, A., Dessie, T., & Abegaz, S. (2021a). EGG PRODUCTION AND QUALITY TRAITS OF SASSO-RIR, NORMAL FEATHERED LOCAL AND THEIR F1 CROSS CHICKENS MANAGED UNDER ON-STATION CONDITION IN SOUTHERN **ETHIOPIA †**. Tropical *Subtropical* Agroecosystems, 24(3). Scopus. and https://www.scopus.com/inward/record.uri?eid=2-s2.0-

85126509487&partnerID=40&md5=d9834a0ea815db746af47f1d9a88e1a4 148 Yigezu, Z. D., & Jawo, T. O. (2021). Empirical analysis of fuelwood consumptions and its environmental implications in rural sub-city, Southern Ethiopia. *International Journal of Sustainable Energy*, 40(5), 448–459. Scopus. https://doi.org/10.1080/14786451.2020.1812609 149

Raj Nadimuthu, L. P., Victor, K., Basha, C. H., Mariprasath, T., Dhanamjayulu, C., Padmanaban, S., & Khan, B. (2021). Energy Conservation Approach for Continuous Power Quality

 Improvement:
 A
 Case
 Study.
 IEEE
 Access,
 9,
 146959–146969.
 Scopus.

 https://doi.org/10.1109/ACCESS.2021.3123153
 149
 149
 149
 149

Legamo, T. M., Ščasný, M., & Tasew, W. (2021). Energy expenditure and fuel choices among households in the Sidama region, Southern Ethiopia. *International Journal of Energy Economics and Policy*, *11*(2), 315–324. Scopus. https://doi.org/10.32479/ijeep.8559 150

Onyema, E. M., Shukla, P. K., Dalal, S., Mathur, M. N., Zakariah, M., & Tiwari, B. (2021). Enhancement of Patient Facial Recognition through Deep Learning Algorithm: ConvNet. *Journal of Healthcare Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/5196000 151

Roy, P. K., Qamar, A. Y., Tanga, B. M., Fang, X., Kim, G., Bang, S., & Cho, J. (2021). Enhancing
Oocyte Competence With Milrinone as a Phosphodiesterase 3A Inhibitor to Improve the
Development of Porcine Cloned Embryos. *Frontiers in Cell and Developmental Biology*, 9.
Scopus. https://doi.org/10.3389/fcell.2021.647616

Gebretsadik, A., Bogale, N., & Negera, D. G. (2021). Epidemiological Trends of Breast Cancer in Southern Ethiopia: A Seven-Year Retrospective Review. *Cancer Control*, 28. Scopus. https://doi.org/10.1177/10732748211055262 153

Zeleke, M., Hailu, D., & Daka, D. (2021). Erectile dysfunction and associated factors among diabetic patients at, Hawassa, Southern, Ethiopia. *BMC Endocrine Disorders*, *21*(1). Scopus. https://doi.org/10.1186/s12902-021-00807-5

Tera, A., Getachew, T., Melesse, A., Rekik, M., Rischkowsky, B., Mwacharo, J. M., Abate, Z., & Haile, A. (2021). Estimates of genetic parameters and trends for reproduction traits in Bonga sheep, Ethiopia. *Tropical Animal Health and Production*, *53*(1). Scopus. https://doi.org/10.1007/s11250-020-02445-w 155

Wegi, T., Hassen, A., Bezabih, M., Nurfeta, A., Yigrem, S., & Tolera, A. (2021). Estimation of feed intake and digestibility in Zebu type Arsi steers fed natural pasture using the n-alkane technique. *Animal Feed Science and Technology*, 271. Scopus. https://doi.org/10.1016/j.anifeedsci.2020.114765 156

Mahela, O. P., Sharma, Y., Ali, S., Khan, B., & Padmanaban, S. (2021). Estimation of IslandingEvents in Utility Distribution Grid with Renewable Energy Using Current Variations andStockwellTransform.IEEEAccess,9,69798–69813.Scopus.https://doi.org/10.1109/ACCESS.2021.3078315157

Birkie, E. B. (2021). Ethnolinguistic perception and identity in Gurage. In Ado D., Gelagay A.W.,
& Johannessen J.J. (Eds.), *IMPACT Stud. Lang. Soc.* (Vol. 48, p. 118). John Benjamins Publishing
Company; Scopus. https://doi.org/10.1075/impact.48.04bek

Bati, T. B., & Workneh, A. W. (2021). Evaluating integrated use of information technologies in secondary schools of Ethiopia using design-reality gap analysis: A school-level study. *Electronic Journal of Information Systems in Developing Countries*, 87(1). Scopus. https://doi.org/10.1002/isd2.12148

Betela, B., & Wolka, K. (2021). Evaluating soil erosion and factors determining farmers' adoptionand management of physical soil and water conservation measures in Bachire watershed,southwestEthiopia.Ethiopia.EnvironmentalChallenges,5.Scopus.https://doi.org/10.1016/j.envc.2021.100348159

Sugebo, B., Demrew, Z., Feleke, S., & Biazen, M. (2021). Evaluation and characterization of rubber seed oil for biodiesel production. *Biomass Conversion and Biorefinery*. Scopus. https://doi.org/10.1007/s13399-021-01900-4 160

Muzemil, S., Chala, A., Tesfaye, B., Studholme, D. J., Grant, M., Yemataw, Z., Mekonin, S., & Olango, T. M. (2021). Evaluation of 20 enset (Ensete ventricosum) landraces for response to Xanthomonas vasicola pv. Musacearum infection. *European Journal of Plant Pathology*, *161*(4), 821–836. Scopus. https://doi.org/10.1007/s10658-021-02365-x 160

Meenakshi, C. M., Ravi, R., Stephen Leon, J., Selvaraj, M., Manikandan, K., Suresh, G., & Lavanya, R. (2021). *Evaluation of improvement in performance of FRP composite by using Al* (*OH3*) as secondary reinforcement. 1921(1). Scopus. https://doi.org/10.1088/1742-6596/1921/1/012092

Mohan, S. K., Ganesan, A. T., Ramarao, M., Mangrulkar, A. L., Rajesh, S., Al Obaid, S., Alfarraj,
S., Sivakumar, S., & Ganesan, M. (2021). Evaluation of Mechanical Properties of Sisal and
Bamboo Fibres Reinforced with Polymer Matrix Composites Prepared by Compression Moulding
Process. *Advances in Materials Science and Engineering*, 2021. Scopus.
https://doi.org/10.1155/2021/2832149

Lencha, S. M., Ulsido, M. D., & Muluneh, A. (2021). Evaluation of seasonal and spatial variations in water quality and identification of potential sources of pollution using multivariate statistical techniques for Lake Hawassa Watershed, Ethiopia. *Applied Sciences (Switzerland)*, *11*(19). Scopus. https://doi.org/10.3390/app11198991 Lambebo, M. K., Kifle, Z. D., Gurji, T. B., & Yesuf, J. S. (2021). Evaluation of wound healing activity of methanolic crude extract and solvent fractions of the leaves of vernonia auriculifera hiern (Asteraceae) in mice. *Journal of Experimental Pharmacology*, *13*, 677–692. Scopus. https://doi.org/10.2147/JEP.S308303

Fikadu, A. A., & Gebre, G. G. (2021). Evidence from Fogera district in Ethiopia on configuration of farmer's information literacy conditions that explain better productivity performance of the horticultural crops. *Agriculture and Food Security*, *10*(1). Scopus. https://doi.org/10.1186/s40066-021-00299-5

Elias, E., Tsegaye, W., Stoecker, B. J., & Gebreegziabher, T. (2021). Excessive intake of iodine and low prevalence of goiter in school age children five years after implementation of national salt iodization in Shebedino woreda, southern Ethiopia. *BMC Public Health*, 21(1). Scopus. https://doi.org/10.1186/s12889-021-10215-y 166

Getaneh, T., Negesse, A., & Dessie, G. (2021). Experiences and reasons of attrition from option b+ among mothers under prevention of mother to child transmission program in northwest ethiopia: Qualitative study. *HIV/AIDS - Research and Palliative Care*, *13*, 851–859. Scopus. https://doi.org/10.2147/HIV.S314306 167

Vijayan, D. S., Mohan, A., Jebasingh Daniel, J., Gokulnath, V., Saravanan, B., & Kumar, P. D. (2021). Experimental Investigation on the Ecofriendly External Wrapping of Glass Fiber Reinforced Polymer in Concrete Columns. *Advances in Materials Science and Engineering*, 2021.
Scopus. https://doi.org/10.1155/2021/2909033

Agegnehu, G., Amede, T., Erkossa, T., Yirga, C., Henry, C., Tyler, R., Nosworthy, M. G., Beyene, S., & Sileshi, G. W. (2021). Extent and management of acid soils for sustainable crop production system in the tropical agroecosystems: A review. *Acta Agriculturae Scandinavica Section B: Soil and Plant Science*, *71*(9), 852–869. Scopus. https://doi.org/10.1080/09064710.2021.1954239 169 Tekeba, A., Ayele, Y., Negash, B., & Gashaw, T. (2021). Extent of and Factors Associated with Self-Medication among Clients Visiting Community Pharmacies in the Era of COVID-19: Does It Relieve the Possible Impact of the Pandemic on the Health-Care System? *Risk Management and Healthcare Policy*, *14*, 4939–4951. Scopus. https://doi.org/10.2147/RMHP.S338590 170

Ewunie, G. A., Morken, J., Lekang, O. I., & Yigezu, Z. D. (2021). Factors affecting the potential of Jatropha curcas for sustainable biodiesel production: A critical review. *Renewable and Sustainable Energy Reviews*, *137*. Scopus. https://doi.org/10.1016/j.rser.2020.110500 171

Atsbeha, A. T., & Gebre, G. G. (2021). Factors Affecting Women Access to AgriculturalExtension Services: Evidence from Poultry Producer Women's in Northwestern Tigray, Ethiopia.Cogent Social Sciences, 7(1). Scopus. https://doi.org/10.1080/23311886.2021.1975413172

Debele, T. Z., Cherkos, E. A., Badi, M. B., Anteneh, K. T., Demssie, F. W., Abdo, A. A., & Mihret,
M. S. (2021). Factors and outcomes associated with the induction of labor in referral hospitals of
Amhara regional state, Ethiopia: A multicenter study. *BMC Pregnancy and Childbirth*, 21(1).
Scopus. https://doi.org/10.1186/s12884-021-03709-5

Borsamo, A., Oumer, M., Asmare, Y., & Worku, A. (2021). Factors associated with delay in seeking treatment among women with pelvic organ prolapse at selected general and referral hospitals of Southern Ethiopia, 2020. *BMC Women's Health*, 21(1). Scopus. https://doi.org/10.1186/s12905-021-01245-0 174

Tafesse, T., Yoseph, A., Mayiso, K., & Gari, T. (2021). Factors associated with stunting among children aged 6–59 months in Bensa District, Sidama Region, South Ethiopia: Unmatched case-control study. *BMC Pediatrics*, *21*(1). Scopus. https://doi.org/10.1186/s12887-021-03029-9 175 Beyene, H., Kassa, D. H., Tadele, H. D., Persson, L., Defar, A., & Berhanu, D. (2021). Factors associated with the referral of children with severe illnesses at primary care level in Ethiopia: A cross-sectional study. *BMJ Open*, *11*(6). Scopus. https://doi.org/10.1136/bmjopen-2020-047640 176

Destaw, F., & Fenta, M. M. (2021b). Farmers' Perception on Climate Variability and its Effects in Ambassel District, Northern Ethiopia. *Agricultural Research*. Scopus. https://doi.org/10.1007/s40003-021-00573-9 177

Ayenew, A., Tolera, A., Nurfeta, A., & Assefa, G. (2021). Farmers' preference and knowledge onindigenous multipurpose browse species towards their feed value in north western Ethiopia.TropicalandSubtropicalAgroecosystems,24(1).Scopus.https://www.scopus.com/inward/record.uri?eid=2-s2.0-

85100292281&partnerID=40&md5=493588f26a348d0161d0a363ce7d07c8 178

Zula, A. T., & Desta, D. T. (2021). Fatty Acid-Related Health Lipid Index of Raw and Fried Nile Tilapia (Oreochromis niloticus) Fish Muscle. *Journal of Food Quality*, 2021. Scopus. https://doi.org/10.1155/2021/6676528 179

XXV

Diwan, T. D., Choubey, S., Hota, H. S., Goyal, S. B., Jamal, S. S., Shukla, P. K., & Tiwari, B. (2021). Feature Entropy Estimation (FEE) for Malicious IoT Traffic and Detection Using Machine Learning. *Mobile Information Systems*, *2021*. Scopus. https://doi.org/10.1155/2021/8091363 180 Birhanu, A. M., Teferra, T. F., & Lema, T. B. (2021). Fermentation Dynamics of Ethiopian Traditional Beer (Tella) as Influenced by Substitution of Gesho (Rhamnus prinoides) with Moringa stenopetala: An Innovation for Nutrition. *International Journal of Food Science*, *2021*. Scopus. https://doi.org/10.1155/2021/7083638 181

Asfaw, D., & Gashaw, Z. (2021). Field Assignment, Field Choice and Preference Matching of Ethiopian High School Students. *Annals of Data Science*, 8(2), 185–204. Scopus. https://doi.org/10.1007/s40745-018-0182-z 181

Branesh Robert, J., Angeline Prabhavathy, R., Joanna, P. S., Christopher Ezhil Singh, S., Murugan, S., Rajkumar, S., & Sharma, S. (2021). Flexural Behaviour of RC Beams with a Circular Opening at the Flexural Zone and Shear Zone Strengthened Using Steel Plates. *Advances in Civil Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/6733402 182

Yalew, A., Tekle Silasie, W., Anato, A., & Fikrie, A. (2021). Food aversion during pregnancy and its association with nutritional status of pregnant women in Boricha Woreda, Sidama Regional State, Southern Ethiopia, 2019. A community based mixed crossectional study design. *Reproductive Health*, 18(1). Scopus. https://doi.org/10.1186/s12978-021-01258-w
183

Geleta, C. D., & Kannan, N. (2021). Forecasting reference evapotranspiration under climate change scenario in Lake Finchaa Watershed, Ethiopia. *International Journal of Agricultural Technology*, *17*(3), 827–846. Scopus. 184

Kassa, M., Kebede, F., & Haile, W. (2021). Forms and Dynamics of Soil Potassium in Acid Soil in the Wolaita Zone of Southern Ethiopia. *Applied and Environmental Soil Science*, 2021. Scopus. https://doi.org/10.1155/2021/9917316 185

Fessha, Y. T., & Dessalegn, B. (2021). Freedom of religion and minority rights in South Africa. *Religions*, *12*(10). Scopus. https://doi.org/10.3390/rel12100901

Fekadu, S., Kanehiro, Y., Kartika, A. V., Hamada, K., Sakurai, N., Mizote, T., Akada, J.,
Yamaoka, Y., Iizasa, H., & Yoshiyama, H. (2021). Gastric epithelial attachment of Helicobacter
pylori induces EphA2 and NMHC-IIA receptors for Epstein-Barr virus. *Cancer Science*, *112*(11),
4799–4811. Scopus. https://doi.org/10.1111/cas.15121

Menuta, F., & Kifle, Y. (2021). *Gender and women representation in Gurage culture of Ethiopia* (Vol. 48, p. 170). Scopus. https://doi.org/10.1075/impact.48.06men 187

Gebre, G. G., Isoda, H., Amekawa, Y., Rahut, D. B., Nomura, H., & Watanabe, T. (2021a). Gender-based Decision Making in Marketing Channel Choice – Evidence of Maize Supply Chains in Southern Ethiopia. *Human Ecology*, *49*(4), 443–451. Scopus. https://doi.org/10.1007/s10745-021-00252-x

Kaske, D., Yacob, K., & Sakato, T. (2021). Gender-Based Violence Case Management Service. *Violence and Gender*, 8(2), 117–124. Scopus. https://doi.org/10.1089/vio.2020.0070 188

Wondimu, Z., Dong, H., Paterson, A. H., Worku, W., & Bantte, K. (2021). Genetic diversity, population structure, and selection signature in Ethiopian sorghum [Sorghum bicolor L. (Moench)] germplasm. *G3: Genes, Genomes, Genetics, 11*(6). Scopus. https://doi.org/10.1093/g3journal/jkab087

Mohammed, A., Faustinelli, P. C., Chala, A., Dejene, M., Fininsa, C., Ayalew, A., Ojiewo, C. O., Hoisington, D. A., Sobolev, V. S., Martínez-Castillo, J., & Arias, R. S. (2021). Genetic fingerprinting and aflatoxin production of Aspergillus section Flavi associated with groundnut in eastern Ethiopia. *BMC Microbiology*, 21(1). Scopus. https://doi.org/10.1186/s12866-021-02290-3 190

Yu, X., Megens, H.-J., Mengistu, S. B., Bastiaansen, J. W. M., Mulder, H. A., Benzie, J. A. H., Groenen, M. A. M., & Komen, H. (2021). Genome-wide association analysis of adaptation to oxygen stress in Nile tilapia (Oreochromis niloticus). *BMC Genomics*, 22(1). Scopus. https://doi.org/10.1186/s12864-021-07486-5 191

Bates, A. E., Primack, R. B., Biggar, B. S., Bird, T. J., Clinton, M. E., Command, R. J., Richards, C., Shellard, M., Geraldi, N. R., Vergara, V., Acevedo-Charry, O., Colón-Piñeiro, Z., Ocampo, D., Ocampo-Peñuela, N., Sánchez-Clavijo, L. M., Adamescu, C. M., Cheval, S., Racoviceanu, T., Adams, M. D., ... Duarte, C. M. (2021). Global COVID-19 lockdown highlights humans as both threats and custodians of the environment. *Biological Conservation*, *263*. Scopus. https://doi.org/10.1016/j.biocon.2021.109175

Paulson, K. R., Kamath, A. M., Alam, T., Bienhoff, K., Abady, G. G., Abbas, J., Abbasi-Kangevari, M., Abbastabar, H., Abd-Allah, F., Abd-Elsalam, S. M., Abdoli, A., Abedi, A., Abolhassani, H., Abreu, L. G., Abu-Gharbieh, E., Abu-Rmeileh, N. M. E., Abushouk, A. I., Adamu, A. L., Adebayo, O. M., ... Kassebaum, N. J. (2021). Global, regional, and national

progress towards Sustainable Development Goal 3.2 for neonatal and child health: All-cause and cause-specific mortality findings from the Global Burden of Disease Study 2019. The Lancet, 398(10303), 870–905. Scopus. https://doi.org/10.1016/S0140-6736(21)01207-1 193 Nigatu, Z. M., Fan, D., & You, W. (2021). GRACE products and land surface models for estimating the changes in key water storage components in the Nile River Basin. Advances in Space Research, 67(6), 1896–1913. Scopus. https://doi.org/10.1016/j.asr.2020.12.042 195 Nigussie, A., Haile, W., Agegnehu, G., & Kiflu, A. (2021a). Grain Yield and Nitrogen Uptake of Maize (Zea mays L.) as Affected by Soil Management Practices and Their Interaction on Cambisols Chernozem. International Journal of Agronomy, 2021. and Scopus. https://doi.org/10.1155/2021/3411456 196

Noulèkoun, F., Birhane, E., Kassa, H., Berhe, A., Gebremichael, Z. M., Adem, N. M., Syoum, Y., Mengistu, T., Lemma, B., Hagazi, N., Abrha, H., Rannestad, M. M., & Mensah, S. (2021). Grazing exclosures increase soil organic carbon stock at a rate greater than "4 per 1000" per year across agricultural landscapes in Northern Ethiopia. *Science of the Total Environment*, 782. Scopus. https://doi.org/10.1016/j.scitotenv.2021.146821

Tesfaye, M., Tesfaye, G., & Getahun, A. (2021). Growth and status of Nile tilapia (Oreochromis niloticus L.) stock in Lake Chamo, Ethiopia. *Lakes and Reservoirs: Research and Management*, 26(3). Scopus. https://doi.org/10.1111/lre.12375 198

Nigussie, A., Haile, W., Agegnehu, G., & Kiflu, A. (2021b). Growth, Nitrogen Uptake of Maize (Zea mays L.) and Soil Chemical Properties, and Responses to Compost and Nitrogen Rates and Their Mixture on Different Textured Soils: Pot Experiment. *Applied and Environmental Soil Science*, *2021*. Scopus. https://doi.org/10.1155/2021/9931763

Mahela, O. P., Khan, B., Alhelou, H. H., Tanwar, S., & Padmanaban, S. (2021). Harmonic mitigation and power quality improvement in utility grid with solar energy penetration using distribution static compensator. *IET Power Electronics*, *14*(5), 912–922. Scopus. https://doi.org/10.1049/pel2.12074 200

Mebrate, B., & Mohammed, A. (2021). Harnack inequality and an asymptotic mean-value property for the Finsler infinity-Laplacian. *Advances in Calculus of Variations*, *14*(3), 365–382. Scopus. https://doi.org/10.1515/acv-2018-0083 201 Belay, S., Giday, M., & Manyazewal, T. (2021). Harnessing Clinical Trial Capacity to Mitigate
Zoonotic Diseases: The Role of Expert Scientists in Ethiopia. *Frontiers in Public Health*, 9.
Scopus. https://doi.org/10.3389/fpubh.2021.621433

Wolde, S., Mirkena, T., Melesse, A., Dessie, T., & Abegaz, S. (2021b). Hatchability and growth performances of normal feathered local, Sasso-RIR and their F1-cross chickens managed under on-station condition in southern Ethiopia. *Tropical Animal Health and Production*, *53*(5). Scopus. https://doi.org/10.1007/s11250-021-02957-z 202

Tenaw, Z., Siyoum, M., Tsegaye, B., Werba, T. B., & Bitew, Z. W. (2021). Health Professionals
Job Satisfaction and Associated Factors in Ethiopia: A Systematic Review and Meta-analysis. *Health Services Research and Managerial Epidemiology*, 8. Scopus.
https://doi.org/10.1177/2333928211046484 203

Gebere, Y. F., Bimerew, L. G., Malko, W. A., & Fenta, D. A. (2021). Hematological and CD4+ T- cell count reference interval for pregnant women attending antenatal care at Hawassa University Comprehensive Specialized Hospital, Hawassa Southern Ethiopia. *PLoS ONE*, *16*(4 April). Scopus. https://doi.org/10.1371/journal.pone.0249185 204

Mengistu, S. B., Palstra, A. P., Mulder, H. A., Benzie, J. A. H., Trinh, T. Q., Roozeboom, C., & Komen, H. (2021). Heritable variation in swimming performance in Nile tilapia (Oreochromis niloticus) and negative genetic correlations with growth and harvest weight. *Scientific Reports*, *11*(1). Scopus. https://doi.org/10.1038/s41598-021-90418-w 205

Hamada, Y., Getahun, H., Tadesse, B. T., & Ford, N. (2021). HIV-associated tuberculosis. *International Journal of STD and AIDS*, *32*(9), 780–790. Scopus. https://doi.org/10.1177/0956462421992257 206

Hailu, D., Tadele, H., Tadesse, B. T., Alemayehu, A., Abuka, T., Woldegebriel, F., Gedefaw, A., Mengesha, S., & Haji, Y. (2021). Home delivery practice and its predictors in South Ethiopia. *PLoS ONE*, *16*(8 August). Scopus. https://doi.org/10.1371/journal.pone.0254696 207
Kaliappan, S., Saravanakumar, R., Karthick, A., Kumar, P. M., Venkatesh, V., Mohanavel, V., & Rajkumar, S. (2021). Hourly and Day Ahead Power Prediction of Building Integrated Semitransparent Photovoltaic System. *International Journal of Photoenergy*, *2021*. Scopus. https://doi.org/10.1155/2021/7894849 208

Hernandez-Ramirez, G., Ruser, R., & Kim, D.-G. (2021). How does soil compaction alter nitrousoxidefluxes? Ameta-analysis.SoilandTillageResearch,211.Scopus.https://doi.org/10.1016/j.still.2021.105036208

Ketema, A., & Dwarakish, G. S. (2021a). Hydro-meteorological impact assessment of climate change on Tikur Wuha watershed in Ethiopia. *Sustainable Water Resources Management*, 7(4).
Scopus. https://doi.org/10.1007/s40899-021-00547-3 209

Nigatu, Z. M., Fan, D., You, W., & Melesse, A. M. (2021). Hydroclimatic extremes evaluation using GRACE/GRACE-FO and multidecadal climatic variables over the nile river basin. *Remote Sensing*, *13*(4), 1–25. Scopus. https://doi.org/10.3390/rs13040651 210

Chala, G., Eguale, T., Abunna, F., Asrat, D., & Stringer, A. (2021). Identification and Characterization of Campylobacter Species in Livestock, Humans, and Water in Livestock Owning Households of Peri-urban Addis Ababa, Ethiopia: A One Health Approach. *Frontiers in Public Health*, 9. Scopus. https://doi.org/10.3389/fpubh.2021.750551 211

Swarnkar, N. K., Mahela, O. P., Khan, B., & Lalwani, M. (2021). Identification of Islanding Events in Utility Grid with Renewable Energy Penetration Using Current Based Passive Method. *IEEE Access*, 9, 93781–93794. Scopus. https://doi.org/10.1109/ACCESS.2021.3092971 212

Getaneh, T., Negesse, A., Dessie, G., Desta, M., Temesgen, H., Getu, T., & Gelaye, K. (2021b). Impact of cesarean section on timely initiation of breastfeeding in Ethiopia: A systematic review and meta-analysis. *International Breastfeeding Journal*, *16*(1), 51. Scopus. https://doi.org/10.1186/s13006-021-00399-9 213

Sarathchandra, C., Alemu Abebe, Y., Worthy, F. R., Lakmali Wijerathne, I., Ma, H., Yingfeng, B., Jiayu, G., Chen, H., Yan, Q., Geng, Y., Weragoda, D. S., Li, L.-L., Fengchun, Y., Wickramasinghe, S., & Xu, J. (2021). Impact of land use and land cover changes on carbon storage in rubber dominated tropical Xishuangbanna, South West China. *Ecosystem Health and Sustainability*, *7*(1). Scopus. https://doi.org/10.1080/20964129.2021.1915183 214 Jambo, Y., Alemu, A., & Tasew, W. (2021). Impact of small-scale irrigation on household food security: Evidence from Ethiopia. *Agriculture and Food Security*, *10*(1). Scopus. https://doi.org/10.1186/s40066-021-00294-w 215

Hurisso, T. T., Davis, J. G., Chala, A., Getachew, A., & Wolde-Meskel, E. (2021). Impacts of Grinding and Acidification of Animal Bones with Coffee Wastewater on Plant Dry Matter Yield

and Recovery of Phosphorus. Communications in Soil Science and Plant Analysis, 52(10), 1076–1088. Scopus. https://doi.org/10.1080/00103624.2021.1872603216

Tadesse, E., Negash, M., & Asfaw, Z. (2021). Impacts of traditional agroforestry practices, altitudinal gradients and households' wealth status on perennial plants species composition, diversity, and structure in south-central Ethiopia. *Agroforestry Systems*, *95*(8), 1533–1561. Scopus. https://doi.org/10.1007/s10457-021-00659-x 217

Fakhar, M. S., Kashif, S. A. R., Liaquat, S., Rasool, A., Padmanaban, S., Iqbal, M. A., Baig, M. A., & Khan, B. (2021). Implementation of APSO and Improved APSO on Non-Cascaded and Cascaded Short Term Hydrothermal Scheduling. *IEEE Access*, *9*, 77784–77797. Scopus. https://doi.org/10.1109/ACCESS.2021.3083528

Arunkumar, G., Dhanamjayulu, C., Padmanaban, S., Prusty, B. R., & Khan, B. (2021). Implementation of Optimization-Based PI Controller Tuning for Non-Ideal Differential Boost Inverter. *IEEE Access*, 9, 58677–58688. Scopus. https://doi.org/10.1109/ACCESS.2021.3071538 218

Taye, T., Moges, A., Muluneh, A., Lebay, M., & Abiye, W. (2021). Implication of Long-Term Terracing Watershed Development on Soil Macronutrients and Crop Production in Maybar Subwatershed, South Wello Zone, Ethiopia. *Air, Soil and Water Research, 14*. Scopus. https://doi.org/10.1177/11786221211004220 219

Taye, T., & Moges, A. (2021). Implication of long-term watershed development on land use/land cover change and sediment loss in Maybar Sub-Watershed, South Wello Zone, Ethiopia. *Cogent Food and Agriculture*, 7(1). Scopus. https://doi.org/10.1080/23311932.2020.1863596
Kibret, K. S., Marohn, C., & Cadisch, G. (2021). Improved food-insecurity prediction in smallholder-dominated landscapes using MODIS Enhanced Vegetation Index and Google Earth Engine: A case study in South Central Ethiopia. *European Journal of Remote Sensing*, 54(1), 624–640. Scopus. https://doi.org/10.1080/22797254.2021.1999176

Kumar, S. D., Sankar, L. P., Sathish, T., Vijayan, V., Parthiban, A., Kamalakannan, R., & Rajkumar, S. (2021). Improving the mechanical properties of natural fiber composites of hemp fiber with ramie and banana fiber through compression molding method. *Advances in Materials Science and Engineering*, *2021*. Scopus. https://doi.org/10.1155/2021/7813634 221 Andualem, D., Gelgele, M., & Bayssa, M. (2021). In vitro gas production kinetics of selected

multipurpose tree browses in Gelana rangelands. Livestock Research for Rural Development,

33(2).Scopus.https://www.scopus.com/inward/record.uri?eid=2-s2.0-85106381450&partnerID=40&md5=a9e6f3ea05c97669c5ef0bc4233678f4222Bekele, E. K., Tyler, R. T., Henry, C. J., House, J. D., & Nosworthy, M. G. (2021). In vitro protein202digestibility of direct-expanded chickpea–sorghum snacks. Legume Science, 3(4). Scopus.223https://doi.org/10.1002/leg3.87223

Assele, D. D., Lendado, T. A., Awato, M. A., Workie, S. B., & Faltamo, W. F. (2021). Incidence and predictors of mortality among patients with head injury admitted to Hawassa University Comprehensive Specialized Hospital, Southern Ethiopia: A retrospective follow-up study. *PLoS ONE*, *16*(8 August). Scopus. https://doi.org/10.1371/journal.pone.0254245 224

Hordofa, D., Abunna, F., Megersa, B., & Abebe, R. (2021). Incidence of morbidity and mortality in calves from birth to six months of age and associated risk factors on dairy farms in Hawassa city, southern Ethiopia. *Heliyon*, 7(12). Scopus. https://doi.org/10.1016/j.heliyon.2021.e08546 225

Worojie, T. B., Asfaw, B. T., & Mengesha, W. A. (2021b). Indigenous biosystematics of yams (Dioscorea spp.) in Southwest Ethiopia: Folk taxonomy, ethnolinguistic analysis, and folk descriptors. *Journal of Ethnobiology and Ethnomedicine*, 17(1). Scopus. https://doi.org/10.1186/s13002-020-00427-8

Cochrane, L., & Thornton, A. (2021). Individual and Institutional Drivers of Inequality in Rural Agricultural Contexts: Evidence from Southern Ethiopia. *Northeast African Studies*, *21*(1), 19–44. Scopus. 227

Yuvarani, P., Vijayachitra, S., Ranganayaki, V., Sathish Kumar, S., Srujan Raju, K., Sivachitra, M., & Komalnu Raghavan, I. (2021). Industrial Waste Water Recycling Using Nanographene
Oxide Filters. Advances in Materials Science and Engineering, 2021. Scopus.
https://doi.org/10.1155/2021/4528949
227

Nijjar, S., Sudhakara, P., Sharma, S., Saini, S., Teklemariam, A., Mariselvam, V., Sampath, S. K., & Song, J. I. (2021). Influence of Alkali Treatment and Maleated Polypropylene (MAPP) Compatibilizer on the Dry-Sliding Wear and Frictional Behavior of Borassus Fruit Fine Fiber (BFF)/Polypropylene (PP) Polymer Composites for Various Engineering Applications. *Advances in Materials Science and Engineering*, *2021*. Scopus. https://doi.org/10.1155/2021/5822245 228 Sankar, C., Gangatharan, K., Christopher Ezhil Singh, S., & Sivaraj, M. (2021). Influence of AZ91 alloy reinforced with nano B4C particles on microstructural characterization, hardness and

tribological properties prepared through powder metallurgy. *Materials Research Express*, 8(10). Scopus. https://doi.org/10.1088/2053-1591/ac2ce5 229

Desta, D. T., Kelikay, G. N., Zekwos, M., Eshete, M., Reda, H. H., Alemayehu, F. R., & Zula, A. T. (2021). Influence of fermentation time on proximate composition and microbial loads of Enset, (Ensete ventricosum), sampled from two different agroecological districts. *Food Science and Nutrition*, *9*(10), 5641–5647. Scopus. https://doi.org/10.1002/fsn3.2527 230

Prakash, K. B., Fageehi, Y. A., Saminathan, R., Manoj Kumar, P., Saravanakumar, S., Subbiah, R., Arulmurugan, B., & Rajkumar, S. (2021). Influence of Fiber Volume and Fiber Length on Thermal and Flexural Properties of a Hybrid Natural Polymer Composite Prepared with Banana Stem, Pineapple Leaf, and S-Glass. *Advances in Materials Science and Engineering*, 2021.
Scopus. https://doi.org/10.1155/2021/6329400 231

Arulmurugan, B., Balaji, D., Rajkumar, S., Kamaraj, M., Mageshwaran, V., Sathishkumar, M., Manikandan, M., & Arivazhagan, N. (2021). Influence of Filler Wire and Welding Process to Mitigate the Microsegregation of Alloy C-2000 Using Continuous and Pulsed Current Gas Tungsten Arc Welding Techniques. *Journal of Materials Engineering and Performance*, *30*(8), 6050–6067. Scopus. https://doi.org/10.1007/s11665-021-05810-4

Jeffrey, J. A., Sivakumar, A., Kumar, R. N., Anbazhagan, A., Manojkumar, G., Al Obaid, S., Alfarraj, S., Sivakumar, S., & Rajkumar, S. (2021). Influence of Flax Fibre Hybridization on Mechanical Behaviour of Sisal Fibre-Polypropylene Composites Prepared with an Injection Moulding Machine. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/4594465 232

Endalamaw, T. B., & Darr, D. (2021). Institutional and technological innovation for the bamboo sector as an instrument for development and climate change resilience in Ethiopia. *African Journal of Science, Technology, Innovation and Development, 13*(7), 817–828. Scopus. https://doi.org/10.1080/20421338.2020.1837447 233

Tschopp, R., Gebregiorgis, A., Tassachew, Y., Andualem, H., Osman, M., Waqjira, M. W., Hattendorf, J., Mohammed, A., Hamid, M., Molla, W., Mitiku, S. A., Walke, H., Negron, M., Kadzik, M., & Mamo, G. (2021). Integrated human-animal sero-surveillance of brucellosis in the pastoral afar and somali regions of ethiopia. *PLoS Neglected Tropical Diseases*, *15*(8). Scopus. https://doi.org/10.1371/journal.pntd.0009593
Dharmaraj, R., Arunvivek, G. K., Karthick, A., Mohanavel, V., Perumal, B., & Rajkumar, S. (2021). Investigation of Mechanical and Durability Properties of Concrete Mixed with Water Exposed to a Magnetic Field. *Advances in Civil Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/2821419 235

Munimathan, A., Sathish, T., Mohanavel, V., Karthick, A., Madavan, R., Subbiah, R., Masi, C., & Rajkumar, S. (2021). Investigation on Heat Transfer Enhancement in Microchannel Using Al2O3/Water Nanofluids. *International Journal of Photoenergy*, 2021. Scopus. https://doi.org/10.1155/2021/6680627 236

Rajkumar, S., Arulmurugan, B., Teklemariam, A., Tafesse, D., Mekonnen, A., & Mulugeta, L.
(2021). *Investigation on mechanical properties of AA2024/HBN composites prepared by stir casting method.* 47, 396–399. Scopus. https://doi.org/10.1016/j.matpr.2021.04.593 236

Verma, A., Singh, A., Anand, D., Aljahdali, H. M., Alsubhi, K., & Khan, B. (2021). IoT Inspired Intelligent Monitoring and Reporting Framework for Education 4.0. *IEEE Access*, *9*, 131286– 131305. Scopus. https://doi.org/10.1109/ACCESS.2021.3114286 237

Obsa, A. K., Tegene, Y., & Gebretsadik, A. (2021). Iron and folic acid supplementation compliance and associated factors among pregnant women attending antenatal clinic in Shalla district, southwest Ethiopia: A cross-sectional study. *Journal of Nutrition and Metabolism*, 2021. Scopus. https://doi.org/10.1155/2021/6655027 238

Orsango, A. Z., Habtu, W., Lejisa, T., Loha, E., Lindtjørn, B., & Engebretsen, I. M. S. (2021). Iron deficiency anemia among children aged 2–5 years in southern Ethiopia: A community-based cross-sectional study. *PeerJ*. Scopus. https://doi.org/10.7717/peerj.11649 239

Abda, S., Haile, T., & Abera, M. (2021). Isolation, identification antimicrobial susceptibility and associated risk factors of Salmonella in semi-intensive poultry farms of Kafa zone, Southwest Ethiopia. *Veterinary and Animal Science*, *14*. Scopus. https://doi.org/10.1016/j.vas.2021.100206 240

Williams, J. E., McGuire, M. K., Meehan, C. L., McGuire, M. A., Brooker, S. L., Kamau-Mbuthia,
E. W., Kamundia, E. W., Mbugua, S., Moore, S. E., Prentice, A. M., Otoo, G. E., Rodríguez, J.
M., Pareja, R. G., Foster, J. A., Sellen, D. W., Kita, D. G., Neibergs, H. L., & Murdoch, B. M.
(2021). Key genetic variants associated with variation of milk oligosaccharides from diverse human populations. *Genomics*, *113*(4), 1867–1875. Scopus.
https://doi.org/10.1016/j.ygeno.2021.04.004 241

Leslie, J. F., Moretti, A., Mesterházy, Á., Ameye, M., Audenaert, K., Singh, P. K., Richard-Forget, F., Chulze, S. N., Del Ponte, E. M., Chala, A., Battilani, P., & Logrieco, A. F. (2021). Key global actions for mycotoxin management in wheat and other small grains. *Toxins*, *13*(10). Scopus. https://doi.org/10.3390/toxins13100725 241

Senbeta, A. M., Mamo, F. T., Desalegn, B. B., & Daba, A. K. (2021). Knowledge and practices of iodized salt utilization, health consequences, and iodine concentration on dietary salts at retailer and households in Jigjiga town, Somali, Ethiopia. *Cogent Food and Agriculture*, 7(1). Scopus. https://doi.org/10.1080/23311932.2021.1911421 242

Yoseph, A., Tamiso, A., & Ejeso, A. (2021). Knowledge, attitudes, and practices related to COVID-19 pandemic among adult population in Sidama Regional State, Southern Ethiopia: A community based cross-sectional study. *PLoS ONE*, *16*(1 January). Scopus. https://doi.org/10.1371/journal.pone.0246283 243

Getu Engida, T., Nigussie, T. A., Aneseyee, A. B., & Barnabas, J. (2021). Land Use/Land Cover Change Impact on Hydrological Process in the Upper Baro Basin, Ethiopia. *Applied and Environmental Soil Science*, 2021. Scopus. https://doi.org/10.1155/2021/6617541 244

Allito, B. B., Ewusi-Mensah, N., Logah, V., & Hunegnaw, D. K. (2021). Legume-rhizobium specificity effect on nodulation, biomass production and partitioning of faba bean (Vicia faba L.). *Scientific Reports*, *11*(1). Scopus. https://doi.org/10.1038/s41598-021-83235-8 245

Abdisa, S., & Tenaw, Z. (2021). Level of adherence to option B plus PMTCT and associatedfactors among HIV positive pregnant and lactating women in public health facilities of Hawassacity,SouthernEthiopia.PLoSONE,16(8August).Scopus.https://doi.org/10.1371/journal.pone.0255808246

Asferaw, M., Tolesa, K., Sherief, S. T., Tadegagne, B., Sintayehu, M., Worku, A., Wondale, T., Girma, E., Gizachew, Z., Gilbert, C., & Woodruff, G. (2021). Limitations in cataract surgical services for children in Ethiopia: A nationwide survey of pediatric cataract surgeons. *BMC Ophthalmology*, *21*(1). Scopus. https://doi.org/10.1186/s12886-021-02190-0 247

Negash, M., & Starr, M. (2021). Litter decomposition of six tree species on indigenous agroforestry farms in south-eastern Ethiopia in relation to litterfall carbon inputs and modelled soil respiration. *Agroforestry Systems*, *95*(4), 755–766. Scopus. https://doi.org/10.1007/s10457-021-00630-w

Mengistu, S., Nurfeta, A., Tolera, A., Bezabih, M., Adie, A., Wolde-Meskel, E., & Zenebe, M. (2021). Livestock Production Challenges and Improved Forage Production Efforts in the Damot Gale District of Wolaita Zone, Ethiopia. *Advances in Agriculture*, 2021. Scopus. https://doi.org/10.1155/2021/5553659 249

van de Ven, G. W. J., de Valença, A., Marinus, W., de Jager, I., Descheemaeker, K. K. E., Hekman, W., Mellisse, B. T., Baijukya, F., Omari, M., & Giller, K. E. (2021). Living income benchmarking of rural households in low-income countries. *Food Security*, *13*(3), 729–749. Scopus. https://doi.org/10.1007/s12571-020-01099-8 250

Tiwari, B., Damena, S., Urgessa, T., Jain, S., & Kumar Sharma, H. (2021). *Load balancing Technique toward Congestion minimization in WSN-enabled-Healthcare*. 2021 IEEE International Conference on Technology, Research, and Innovation for Betterment of Society, TRIBES 2021. Scopus. https://doi.org/10.1109/TRIBES52498.2021.9751667 251

Lemma, B., Williams, S., & Paustian, K. (2021). Long term soil carbon sequestration potential of smallholder croplands in southern Ethiopia with DAYCENT model. *Journal of Environmental Management*, 294. Scopus. https://doi.org/10.1016/j.jenvman.2021.112893 252

Fenta, D. A., Wube, T. B., & Nuru, M. M. (2021). Long-Term Immunological and Virological Outcomes in Children Receiving Highly Active Antiretroviral Therapy at Hawassa University College of Medicine and Health Sciences, Southern Ethiopia. *Journal of Immunology Research*, 2021. Scopus. https://doi.org/10.1155/2021/2498025

Areru, H. A., Dangisso, M. H., & Lindtjørn, B. (2021). Low and unequal use of outpatient health services in public primary health care facilities in southern Ethiopia: A facility-based cross-sectional study. *BMC Health Services Research*, 21(1). Scopus. https://doi.org/10.1186/s12913-021-06846-x 254

Shehmolo, M., Gari, T., Tesfaye, D. J., Boti, N., & Oumer, B. (2021). Magnitude and factors associated with hygiene practice among primary school children in mareko district, Southern Ethiopia: A cross-sectional study. *Journal of Multidisciplinary Healthcare*, *14*, 311–320. Scopus. https://doi.org/10.2147/JMDH.S285954 255

Wachamo, D., Bonja, F., Tadege, B., & Hussen, S. (2021). Magnitude of parasitic infections and associated factors among pregnant women at health facilities in Hawassa, Southern Ethiopia. *F1000Research*, *10*. Scopus. https://doi.org/10.12688/f1000research.27584.1

Hailemariam, M., Alemayehu, T., Tadesse, B., Nigussie, N., Agegnehu, A., Habtemariam, T., Ali,
M., Mitiku, E., & Azerefegne, E. (2021). Major bacterial isolate and antibiotic resistance from routine clinical samples in Southern Ethiopia. *Scientific Reports*, 11(1). Scopus. https://doi.org/10.1038/s41598-021-99272-2

Oppel, S., Arkumarev, V., Bakari, S., Dobrev, V., Saravia-Mullin, V., Adefolu, S., Sözüer, L. A., Apeverga, P. T., Arslan, Ş., Barshep, Y., Bino, T., Bounas, A., Çetin, T., Dayyoub, M., Dobrev, D., Duro, K., El-Moghrabi, L., ElSafoury, H., Endris, A., ... Nikolov, S. C. (2021). Major threats to a migratory raptor vary geographically along the eastern Mediterranean flyway. *Biological Conservation*, *262*. Scopus. https://doi.org/10.1016/j.biocon.2021.109277 258

Wubshet, M. L., & Chala, A. (2021). Management of faba bean chocolate spot (Botrytis fabae)through varieties and fungicide application frequencies in Southern Tigray, Ethiopia. Archives ofPhytopathologyandPlantProtection,54(19–20),2233–2246.Scopus.https://doi.org/10.1080/03235408.2021.1925516259

Bhattacharjee, N. V., Schaeffer, L. E., Hay, S. I., Lu, D., Schipp, M. F., Lazzar-Atwood, A., Donkers, K. M., Abady, G. G., Abd-Allah, F., Abdelalim, A., Abebo, Z. H., Abejie, A. N., Abosetugn, A. E., Abreu, L. G., Abrigo, M. R. M., Abu-Gharbieh, E., Abushouk, A. I., Adamu, A. L., Adedeji, I. A., ... Hay, S. I. (2021). Mapping inequalities in exclusive breastfeeding in lowand middle-income countries, 2000–2018. *Nature Human Behaviour*, *5*(8), 1027–1045. Scopus. https://doi.org/10.1038/s41562-021-01108-6

Sbarra, A. N., Rolfe, S., Nguyen, J. Q., Earl, L., Galles, N. C., Marks, A., Abbas, K. M., Abbasi-Kangevari, M., Abbastabar, H., Abd-Allah, F., Abdelalim, A., Abdollahi, M., Abegaz, K. H., Abiy, H. A. A., Abolhassani, H., Abreu, L. G., Abrigo, M. R. M., Abushouk, A. I., Accrombessi, M. M. K., ... Mosser, J. F. (2021). Mapping routine measles vaccination in low- and middle-income countries. Nature, 589(7842), 415-419. Scopus. https://doi.org/10.1038/s41586-020-03043-4260 Cork, M. A., Henry, N. J., Watson, S., Croneberger, A. J., Baumann, M., Letourneau, I. D., Yang, M., Serfes, A. L., Abbas, J., Abbasi, N., Abbastabar, H., Abreu, L. G., Abu-Gharbieh, E., Achappa, B., Adabi, M., Adal, T. G., Adegbosin, A. E., Adekanmbi, V., Adetokunboh, O. O., ... Dwyer-Lindgren, L. (2021). Mapping subnational HIV mortality in six Latin American countries with incomplete vital registration ВМС Medicine, 19(1). Scopus. systems. https://doi.org/10.1186/s12916-020-01876-4 261

Gebre, G. G., Isoda, H., Amekawa, Y., Rahut, D. B., Nomura, H., & Watanabe, T. (2021b). Marketing Efficiency among Gender-Based Decision-Making Farm Households in Southern Ethiopia. *Journal of International Food and Agribusiness Marketing*. Scopus. https://doi.org/10.1080/08974438.2021.1911906 262

Mebratie, M. A., & Dawed, M. Y. (2021). Mathematical model analysis of crime dynamics incorporating media coverage and police force. *Journal of Mathematical and Computational Science*, *11*(1), 125–148. Scopus. https://doi.org/10.28919/jmcs/5062 262

Galles, N. C., Liu, P. Y., Updike, R. L., Fullman, N., Nguyen, J., Rolfe, S., Sbarra, A. N., Schipp, M. F., Marks, A., Abady, G. G., Abbas, K. M., Abbasi, S. W., Abbastabar, H., Abd-Allah, F., Abdoli, A., Abolhassani, H., Abosetugn, A. E., Adabi, M., Adamu, A. A., ... Yuce, D. (2021). Measuring routine childhood vaccination coverage in 204 countries and territories, 1980–2019: A systematic analysis for the Global Burden of Disease Study 2020, Release 1. *The Lancet*, *398*(10299), 503–521. Scopus. https://doi.org/10.1016/S0140-6736(21)00984-3 263 Feyisa, M., Kassahun, A., & Giday, M. (2021). Medicinal Plants Used in Ethnoveterinary Practices in Adea Berga District, Oromia Region of Ethiopia. *Evidence-Based Complementary and* 

Alternative Medicine, 2021. Scopus. https://doi.org/10.1155/2021/5641479

Olkeba, B. K., Goethals, P. L. M., Boets, P., Duchateau, L., Degefa, T., Eba, K., Yewhalaw, D., & Mereta, S. T. (2021). Mesocosm experiments to quantify predation of mosquito larvae by aquatic predators to determine potential of ecological control of malaria vectors in ethiopia. *International Journal of Environmental Research and Public Health*, *18*(13). Scopus. https://doi.org/10.3390/ijerph18136904 265

Haile, B., Tesfaye, B., & Olango, T. M. (2021). Methods for vegetative propagation of wild enset (Ensete ventricosum (Welw.) Cheesman) that make genotype conservation possible. *Heliyon*, 7(11). Scopus. https://doi.org/10.1016/j.heliyon.2021.e08416
266

Desta, R., Tesfaye, D., & Tóth, J. (2021). Microscopic Traffic Characterization of Light Rail Transit Systems at Level Crossings. *Advances in Civil Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/5574848 268

Birie, B., Kassa, A., Kebede, E., & Terefe, B. (2021). Minimum acceptable diet practice and its associated factors among children aged 6–23 months in rural communities of Goncha district, north West Ethiopia. *BMC Nutrition*, 7(1). Scopus. https://doi.org/10.1186/s40795-021-00444-0

268

264

Ayano, G., Demelash, S., yohannes, Z., Haile, K., Tulu, M., Assefa, D., Tesfaye, A., Haile, K., Solomon, M., Chaka, A., & Tsegay, L. (2021). Misdiagnosis, detection rate, and associated factors of severe psychiatric disorders in specialized psychiatry centers in Ethiopia. *Annals of General Psychiatry*, 20(1). Scopus. https://doi.org/10.1186/s12991-021-00333-7

Roy, P.-K., Qamar, A.-Y., Tanga, B.-M., Bang, S., Seong, G., Fang, X., Kim, G., Edirisinghe, S.-L., De Zoysa, M., Kang, D.-H., Saadeldin, I. M., & Cho, J. (2021). Modified spirulina maxima pectin nanoparticles improve the developmental competence of in vitro matured porcine oocytes. *Animals*, *11*(9). Scopus. https://doi.org/10.3390/ani11092483 271

Merid, Y., Hailu, E., Habtamu, G., Tilahun, M., Abebe, M., Hailu, M., Hailu, T., Datiko, D. G., Woldeamanuel, Y., & Aseffa, A. (2021). Molecular Epidemiology of Mycobacterium tuberculosis strains isolated from pulmonary tuberculosis patients in south Ethiopia. *Journal of Infection in Developing Countries*, *15*(9), 1299–1307. Scopus. https://doi.org/10.3855/jidc.14742 272

Mordal, E., Hanssen, I., Kassa, A., & Vatne, S. (2021). Mothers' Experiences and Perceptions of Facility-based Delivery Care in Rural Ethiopia. *Health Services Insights*, *14*. Scopus. https://doi.org/10.1177/11786329211017684 273

McGuire, M. K., Randall, A. Z., Seppo, A. E., Järvinen, K. M., Meehan, C. L., Gindola, D.,
Williams, J. E., Sellen, D. W., Kamau-Mbuthia, E. W., Kamundia, E. W., Mbugua, S., Moore, S.
E., Prentice, A. M., Foster, J. A., Otoo, G. E., Rodríguez, J. M., Pareja, R. G., Bode, L., McGuire,
M. A., & Campo, J. J. (2021). Multipathogen Analysis of IgA and IgG Antigen Specificity for
Selected Pathogens in Milk Produced by Women From Diverse Geographical Regions: The
INSPIRE Study. *Frontiers in Immunology*, *11*. Scopus.
https://doi.org/10.3389/fimmu.2020.614372

Teshome, F. B. (2021). Municipal solid waste management in Ethiopia; the gaps and ways for improvement. *Journal of Material Cycles and Waste Management*, 23(1), 18–31. Scopus. https://doi.org/10.1007/s10163-020-01118-y 275

Kidanu, S., Azerefegne, F., & Mendesil, E. (2021). Natural insecticides for the control of urticating ant, Tetramorium aculeatum Mayr (Hymenoptera: Formicidae) in a coffee plantation of Southwestern Ethiopia. *Heliyon*, 7(3). Scopus. https://doi.org/10.1016/j.heliyon.2021.e06546 275 Tekola, A. F., Baye, G., Amaje, E., & Tefera, K. (2021). Neonatal near misses and associated factors among mother's who give a live neonate at Hawassa City governmental hospitals, 2019: A

facility based cross-sectional study design. *BMC Pregnancy and Childbirth*, 21(1). Scopus. https://doi.org/10.1186/s12884-021-03601-2\_Conference 276

Riley, J., Calinescu, R., Paterson, C., Kudenko, D., Banks, A., Zin, M., Racharak, T., Le, N., Eid, S., & Espinosa, D. N. (2021). ICAART 2021-PROCEEDINGS OF THE 13TH INTERNATIONAL CONFERENCE ON AGENTS AND ARTIFICIAL INTELLIGENCE. *POWER*, *333*(342), 0. 277

Asfaw, Z. K., Tirsit, A., Barthélemy, E. J., Mesfin, E., Wondafrash, M., Yohannes, D., Ashagre, Y., Park, K., & Laeke, T. (2021). Neurosurgery in Ethiopia: A New Chapter and Future Prospects. *World Neurosurgery*, *152*, e175–e183. Scopus. https://doi.org/10.1016/j.wneu.2021.05.071 278
Zena, A. G., Duff, A. I., Melesse, A., Wolff, J. A., Beldados, A., & Shackley, M. S. (2021). New dates for megalithic stele monuments of Gedeo, South Ethiopia. *Journal of African Archaeology*, *10*(2). Scopus. https://doi.org/10.1163/21915784-bja10006 279

Tadesse Zula, A., Desta, D. T., & Willis, M. S. (2021). Nile tilapia (Oreochromis niloticus) friedin recycled palm oil: Implications for nutrition and health. International Journal of FoodProperties, 24(1), 806–817. Scopus. https://doi.org/10.1080/10942912.2021.1931304280

PÉREZ-CASTILLO, A. G., CHINCHILLA-SOTO, C., ELIZONDO-SALAZAR, J. A., BARBOZA, R., KIM, D.-G., MÜLLER, C., SANZ-COBENA, A., BORZOUEI, A., DAWAR, K., & ZAMAN, M. (2021). Nitrification inhibitor nitrapyrin does not affect yield-scaled nitrous oxide emissions in a tropical grassland. *Pedosphere*, *31*(2), 265–278. Scopus. https://doi.org/10.1016/S1002-0160(20)60070-4 281

Amanuel, F. K. (2021). Nuclear model prediction for production of medical 22Na, 51Cr, 60Co,61Cu, 64Cu, 65Zn, 67, 68Ga, 88Y and 99Mo radionuclides: Comparison of experimental andtheoreticaldata.AppliedRadiationandIsotopes,172.Scopus.https://doi.org/10.1016/j.apradiso.2021.109674282

Uge, B. U., Guo, Y., & Liu, Y. (2021). Numerical Analysis on the Load Sharing Performance ofLong-Short CFG Pile Composite Foundation Subjected to Rotation of Adjacent Retaining Wall.Advances in Civil Engineering, 2021. Scopus. https://doi.org/10.1155/2021/9923534282

Diddana, T. Z., Kelkay, G. N., & Tescha, E. E. (2021). Nutritional Composition and Sensory Acceptability of Stinging Nettle (Urtica simensis) Flour-Supplemented Unleavened Maize (Zea mays L.) Flatbread (Kitta). *International Journal of Food Science*, 2021. Scopus. https://doi.org/10.1155/2021/6666358 283 Honja Kabero, T., Bosha, T., Feleke, F. W., Haile Weldegebreal, D., & Stoecker, B. (2021).
Nutritional Status and Its Association with Cognitive Function among School Aged Children at
Soddo Town and Soddo Zuriya District, Southern Ethiopia: Institution Based Comparative Study. *Global Pediatric Health*, 8. Scopus. https://doi.org/10.1177/2333794X211028198 284

Fekade, M., Bayissa, M., & Nurfeta, A. (2021). Nutritive value of major browse species in east dembia district, central gondar, Ethiopia. *Agricultural Science Digest*, 41(1), 76–80. Scopus. https://doi.org/10.18805/ag.D-192
285

Shiferaw, M., Beyene, H., Gitore, W. A., & Mangasha, A. E. (2021). Occupational safety practices and associated factors among employees in Jinmao and Philip Van Heusen Textile Ethiopia, Hawassa Industrial Park, south Ethiopia. *International Journal of Occupational Safety and Ergonomics*. Scopus. https://doi.org/10.1080/10803548.2021.1946288 286

Gari, T., Solomon, T., & Lindtjørn, B. (2021). Older children are at increased risk of Plasmodium vivax in south-central Ethiopia: A cohort study. *Malaria Journal*, 20(1). Scopus. https://doi.org/10.1186/s12936-021-03790-3 287

Merbold, L., Scholes, R. J., Acosta, M., Beck, J., Bombelli, A., Fiedler, B., Grieco, E., Helmschrot, J., Hugo, W., Kasurinen, V., Kim, D.-G., Körtzinger, A., Leitner, S., López-Ballesteros, A., Ndisi, M., Nickless, A., Salmon, E., Saunders, M., Skjelvan, I., ... Kutsch, W. L. (2021). Opportunities for an African greenhouse gas observation system. *Regional Environmental Change*, *21*(4). Scopus. https://doi.org/10.1007/s10113-021-01823-w

Khamies, M., Magdy, G., Kamel, S., & Khan, B. (2021). Optimal Model Predictive and Linear Quadratic Gaussian Control for Frequency Stability of Power Systems Considering Wind Energy. *IEEE Access*. Scopus. https://doi.org/10.1109/ACCESS.2021.3106448 289

Farhat, M., Kamel, S., Atallah, A. M., & Khan, B. (2021). Optimal power flow solution based on jellyfish search optimization considering uncertainty of renewable energy sources. *IEEE Access*, 9, 100911–100933. Scopus.

Singh, B., Mamuye, W., & Jiru, M. G. (2021). *Optimization of Friction Welding Process Parameters for Weldment of Aluminium–Copper Electrical Connector* (Vol. 26, p. 138). Scopus. https://doi.org/10.1007/978-981-15-7557-0\_11 290

Vijayan, V., Parthiban, A., Sathish, T., Sankar, L. P., Kumar, S. D., Saravanakumar, S., & Tafesse, D. (2021). Optimization of Reinforced Aluminium Scraps from the Automobile Bumpers with

Nickel and Magnesium Oxide in Stir Casting. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/3735438 291

Alemu, T., Wamatu, J., Tolera, A., Beyan, M., Eshete, M., Alkhtib, A., & Rischkowsky, B. (2021). Optimizing near infrared reflectance spectroscopy to predict nutritional quality of chickpea straw for livestock feeding. Animals, 11(12). Scopus. https://doi.org/10.3390/ani11123409 292 Parthiban, A., Vijayan, V., Sathish, T., Dinesh Kumar, S., Ponraj Sankar, L., Parthipan, N., Tafesse, D., & Tufa, M. (2021). Parameters of Porosity and Compressive Strength-Based Optimization on Reinforced Aluminium from the Recycled Waste Automobile Frames. Advances in Materials Science and Engineering, 2021. Scopus. https://doi.org/10.1155/2021/3648480 293 Parthiban, A., Vijayan, V., Sathish, T., Dinesh Kumar, S., Ponraj Sankar, L., Parthipan, N., Tafesse, D., & Tufa, M. (2021). Parameters of Porosity and Compressive Strength-Based Optimization on Reinforced Aluminium from the Recycled Waste Automobile Frames. Advances in Materials Science and Engineering, 2021. Scopus. https://doi.org/10.1155/2021/3648480 293 Deribe, B., Ayalew, M., Geleta, D., Gemechu, L., Bogale, N., Mengistu, K., Gadissa, A., Dula, D., Ababi, G., & Gebretsadik, A. (2021). Perceived quality of nursing care among cancer patients attending hawassa university comprehensive specialized hospital cancer treatment center; hawassa southern ethiopia: Cross-sectional study. Cancer Management and Research, 13, 1225-1231. Scopus. https://doi.org/10.2147/CMAR.S275729 294

Vivek, S., Ravi, R., Stephen Leon, J., Suresh, G., Selvaraj, M., Manikandan, K., & Meenakshi, C.
M. (2021). *Performance evaluation of simple DPHX with helical baffles in annulus side*. *1921*(1).
Scopus. https://doi.org/10.1088/1742-6596/1921/1/012090 295

Alemayehu, T., Asnake, S., Tadesse, B., Azerefegn, E., Mitiku, E., Agegnehu, A., Nigussie, N., Mariam, T. H., & Desta, M. (2021). Phenotypic detection of carbapenem-resistant gram-negative bacilli from a clinical specimen in sidama, ethiopia: A cross-sectional study. *Infection and Drug Resistance*, *14*, 369–380. Scopus. https://doi.org/10.2147/IDR.S289763 296

Getie, A., Kiflu, A., & Meteke, G. (2021). Phosphorus Sorption Characteristics of Luvisols and Nitisols in North Ethiopian Soils. *Applied and Environmental Soil Science*, 2021. Scopus. https://doi.org/10.1155/2021/8823852 297

Kassa, Z. Y., Abeje, A., Ashegu, T., & Hadra, N. (2021). Physical Violence and Associated Factors among Women of Reproductive Age in Gedeo Zone, Southern Ethiopia. *Ethiopian Journal of Health Sciences*, *31*(5), 955–962. Scopus. https://doi.org/10.4314/ejhs.v31i5.6 298

Hussen, S., Asnake, S., Wachamo, D., & Tadesse, B. T. (2021). Pneumococcal nasopharyngeal carriage and antimicrobial susceptibility profile in children under five in southern Ethiopia. *F1000Research*, 9. Scopus. https://doi.org/10.12688/f1000research.27583.3
Chiriko, A. Y. (2021). Political violence and hotels: Economic consequences and response strategies. *Anatolia*, *32*(3), 419–429. Scopus. https://doi.org/10.1080/13032917.2021.1883078 300

Teferra, T. F. (2021a). Possible actions of inulin as prebiotic polysaccharide: A review. FoodFrontiers, 2(4), 407–416. Scopus. https://doi.org/10.1002/fft2.92300

Demissie, D., Geremew, T., Chernet, A. Z., & Ali, M. M. (2021). Potency of commonly retailed antibiotics in pharmacies found in Adama, Oromia regional state, Ethiopia. *PLoS ONE*, *16*(7 July). Scopus. https://doi.org/10.1371/journal.pone.0253971 301

Beressa, T. B., Deyno, S., Mtewa, A. G., Aidah, N., Tuyiringire, N., Lukubye, B., Weisheit, A., Tolo, C. U., & Ogwang, P. E. (2021). Potential Benefits of Antiviral African Medicinal Plants in the Management of Viral Infections: Systematic Review. *Frontiers in Pharmacology*, *12*. Scopus. https://doi.org/10.3389/fphar.2021.682794

Mitkie, A. A., Bekele, F. B., & Debiso, A. T. (2021). Predictors of adverse drug reaction among adult hiv-infected patients on antiretroviral therapy in government hospitals of kaffa zone, ethiopia; november 2018: A retrospective cohort. *Pan African Medical Journal, 38*. Scopus. https://doi.org/10.11604/pamj.2021.38.181.19915 303

Chala, A., Tadesse, B. T., Chaka, T. E., Mukonzo, J., Kitabi, E. N., Tadesse, S., Pohanka, A., Makonnen, E., & Aklillu, E. (2021). Predictors of efavirenz plasma exposure, auto-induction profile, and effect of pharmacogenetic variations among HIV-infected children in ethiopia: A prospective cohort study. *Journal of Personalized Medicine*, *11*(12). Scopus. https://doi.org/10.3390/jpm11121303 304

Getaneh, T., Negesse, A., Dessie, G., Desta, M., Assemie, M. A., & Tigabu, A. (2021a). Predictors of malnutrition among pregnant women in Ethiopia: A systematic review and meta-analysis. *Human Nutrition and Metabolism*, *26*. Scopus. https://doi.org/10.1016/j.hnm.2021.200131 305
Tsegaye, B., Shudura, E., Yoseph, A., & Tamiso, A. (2021). Predictors of skilled maternal health services utilizations: A case of rural women in Ethiopia. *PLoS ONE*, *16*(2 February 2021). Scopus. https://doi.org/10.1371/journal.pone.0246237 306

Ayalew, M., Reta, Y., & Defar, S. (2021). Predictors of unrecognised comorbid depression in<br/>patients with schizophrenia at Amanuel mental specialized hospital, Ethiopia: A cross-sectional<br/>study. *BMJ Open*, 11(9). Scopus. https://doi.org/10.1136/bmjopen-2021-049026308<br/>308<br/>Sawle, Y., Jain, S., Babu, S., Nair, A. R., & Khan, B. (2021). Prefeasibility Economic and<br/>Sensitivity Assessment of Hybrid Renewable Energy System. IEEE Access, 9, 28260–28271.<br/>Scopus. https://doi.org/10.1109/ACCESS.2021.3058517\_Conference309

Alano, A., Hanson, L., & Madda, M. (2021). Premises and rationale of contraceptive services accessing in southern Ethiopia: A phenomenological exploration. *Ethiopian Journal of Reproductive Health*, *13*(2), 38–45. Scopus. 309

Astawesegn, F. H., Stulz, V., Agho, K. E., Mannan, H., Conroy, E., & Ogbo, F. A. (2021). Prenatal hiv test uptake and its associated factors for prevention of mother to child transmission of hiv in East Africa. *International Journal of Environmental Research and Public Health*, *18*(10). Scopus. https://doi.org/10.3390/ijerph18105289 310

Duko, B., Pereira, G., Tait, R. J., Nyadanu, S. D., Betts, K., & Alati, R. (2021). Prenatal Tobacco Exposure and the Risk of Tobacco Smoking and Dependence in Offspring: A Systematic Review and Meta-Analysis. *Drug and Alcohol Dependence*, 227. Scopus. https://doi.org/10.1016/j.drugalcdep.2021.108993 311

Tsade, H., Anshebo, S. T., & Sabir, F. K. (2021). Preparation and Characterization of Functionalized Cellulose Nanomaterials (CNMs) for Pb(II) Ions Removal from Wastewater. *Journal of Chemistry*, 2021. Scopus. https://doi.org/10.1155/2021/5514853 312

Minckas, N., Medvedev, M. M., Adejuyigbe, E. A., Brotherton, H., Chellani, H., Estifanos, A. S., Ezeaka, C., Gobezayehu, A. G., Irimu, G., Kawaza, K., Kumar, V., Massawe, A., Mazumder, S., Mambule, I., Medhanyie, A. A., Molyneux, E. M., Newton, S., Salim, N., Tadele, H., ... Lawn, J. E. (2021). Preterm care during the COVID-19 pandemic: A comparative risk analysis of neonatal deaths averted by kangaroo mother care versus mortality due to SARS-CoV-2 infection. *EClinicalMedicine*, *33*. Scopus. https://doi.org/10.1016/j.eclinm.2021.100733

Ayalew, M., Deribe, B., Abraham, Y., Reta, Y., Tadesse, F., Defar, S., Hoyiso, D., & Ashegu, T. (2021). Prevalence and determinant factors of mental health problems among healthcare professionals during COVID-19 pandemic in southern Ethiopia: Multicentre cross-sectional study. *BMJ Open*, *11*(12), e057708. Scopus. https://doi.org/10.1136/bmjopen-2021-057708 314

Bedaso, A., Adams, J., Peng, W., & Sibbritt, D. (2021a). Correction to: Prevalence and determinants of low social support during pregnancy among Australian women: A communitybased cross-sectional study (Reproductive Health, (2021), 18, 1, (158), 10.1186/s12978-021-01210-y). Reproductive Health, 18(1). Scopus. https://doi.org/10.1186/s12978-021-01231-7 315 Tsegaye, B., Amare, B., & Reda, M. (2021). Prevalence and factors associated with immediate postnatal care utilization in ethiopia: Analysis of Ethiopian demographic health survey 2016. International Journal of Women's Health, 13. 257-266. Scopus. 317 https://doi.org/10.2147/IJWH.S294058

Debelo, M., Abdela, H., Tesfaye, A., Tiruneh, A., Mekonnen, G., Asefa, Z., & Moje, N. (2021). Prevalence of Bovine Rotavirus and Coronavirus in Neonatal Calves in Dairy Farms of Addis Ababa, Ethiopia: Preliminary Study. *BioMed Research International*, 2021. Scopus. https://doi.org/10.1155/2021/5778455 318

Duko, B., Wolka, S., Seyoum, M., & Tantu, T. (2021). Prevalence of depression among women with obstetric fistula in low-income African countries: A systematic review and meta-analysis. *Archives of Women's Mental Health*, 24(1). Scopus. https://doi.org/10.1007/s00737-020-01028-w 319

Tadese, M., Kassa, A., Muluneh, A. A., & Altaye, G. (2021). Prevalence of dysmenorrhoea, associated risk factors and its relationship with academic performance among graduating female university students in Ethiopia: A cross-sectional study. *BMJ Open*, *11*(3). Scopus. https://doi.org/10.1136/bmjopen-2020-043814 320

Gebre, G. G., & Rahut, D. B. (2021). Prevalence of household food insecurity in East Africa: Linking food access with climate vulnerability. *Climate Risk Management*, *33*. Scopus. https://doi.org/10.1016/j.crm.2021.100333 321

Kumma, W. P., Lindtjørn, B., & Loha, E. (2021). Prevalence of hypertension, and related factors among adults in Wolaita, southern Ethiopia: A community-based cross-sectional study. *PLoS ONE*, *16*(12 December). Scopus. https://doi.org/10.1371/journal.pone.0260403 322

Bitew, Z. W., Alemu, A., Tenaw, Z., Alebel, A., Worku, T., & Ayele, E. G. (2021). Prevalence of metabolic syndrome among children and adolescents in high-income countries: A systematic review and meta-analysis of observational studies. *BioMed Research International*, 2021. Scopus. https://doi.org/10.1155/2021/6661457 323 Oltaye, Z., Geja, E., & Tadele, A. (2021). Prevalence of motorcycle accidents and its associated factors among road traffic accident patients in hawassa university comprehensive specialized hospital, 2019. *Open Access Emergency Medicine*, *13*, 213–220. Scopus. https://doi.org/10.2147/OAEM.S291510 324

Alemayehu, T. (2021). Prevalence of multidrug-resistant bacteria in Ethiopia: A systematic review and meta-analysis. *Journal of Global Antimicrobial Resistance*, 26, 133–139. Scopus. https://doi.org/10.1016/j.jgar.2021.05.017 325

Awol, R. N., Reda, D. Y., & Gidebo, D. D. (2021). Prevalence of Salmonella enterica serovar Typhi infection, its associated factors and antimicrobial susceptibility patterns among febrile patients at Adare general hospital, Hawassa, southern Ethiopia. *BMC Infectious Diseases*, 21(1). Scopus. https://doi.org/10.1186/s12879-020-05726-9 326

Hussen, S., Assegu, D., Tadesse, B. T., & Shimelis, T. (2021). Prevalence of Schistosoma mansoni infection in Ethiopia: A systematic review and meta-analysis. *Tropical Diseases, Travel Medicine and Vaccines*, 7(1). Scopus. https://doi.org/10.1186/s40794-020-00127-x 327

Getaneh, T., Negesse, A., Dessie, G., Desta, M., & Tigabu, A. (2021c). Prevalence of Urinary Tract Infection and Its Associated Factors among Pregnant Women in Ethiopia: A Systematic Review and Meta-Analysis. *BioMed Research International*, 2021. Scopus. https://doi.org/10.1155/2021/6551526 328

Fekadu, A., Dobo, B., & Birmeka, M. (2021). Prevalence of, and risk factors for, malaria infection among patients visiting Goljota Health Center, Heben Arsi District, West Arsi Zone, Oromia Regional State, Ethiopia: A retrospective and an institution-based cross-sectional study. *Ethiopian Journal of Health Development*, 35(1), 50–57. Scopus.

Zenebe, M. H., Mekonnen, Z., Loha, E., & Padalko, E. (2021b). Prevalence, risk factors and association with delivery outcome of curable sexually transmitted infections among pregnant women in Southern Ethiopia. *PLoS ONE*, *16*(3 March). Scopus. https://doi.org/10.1371/journal.pone.0248958 331

Adow, M. T., Gebresilasie, S. F., & Abebe, N. A. (2021). Primary ovarian choriocarcinoma: Rareentity.CaseReportsinObstetricsandGynecology,2021.Scopus.https://doi.org/10.1155/2021/4545375332

Gebremariam, S. N., & Marchetti, J. M. (2021b). Process simulation and techno-economic performance evaluation of alternative technologies for biodiesel production from low value non-

edible oil. *Biomass and Bioenergy*, 149. Scopus. https://doi.org/10.1016/j.biombioe.2021.106102 333

Amekawa, Y., Hongsibsong, S., Sawarng, N., Yadoung, S., & Gebre, G. G. (2021). Producers' perceptions of public good agricultural practices standard and their pesticide use: The case of Q-GAP for cabbage farming in Chiang Mai Province, Thailand. *Sustainability (Switzerland)*, *13*(11). Scopus. https://doi.org/10.3390/su13116333

Bayssa, M., Yigrem, S., Betsha, S., & Tolera, A. (2021). Production, reproduction and some adaptation characteristics of Boran cattle breed under changing climate: A systematic review and meta-analysis. *PLoS ONE*, *16*(5 May). Scopus. https://doi.org/10.1371/journal.pone.0244836334 Abera, M., Tolera, A., Nurfeta, A., & Geleti, D. (2021a). PRODUCTION, UTILIZATION AND CONSTRAINTS OF DESHO GRASS (Pennisetum glaucifolium) AS LIVESTOCK FEED IN ETHIOPIA. *Online Journal of Animal and Feed Research*, *11*(6), 196–205. Scopus. https://doi.org/10.51227/OJAFR.2021.29

Agrahari, A., Singh, P., Veer, A., Singh, A., Vidyarthi, A., & Khan, B. (2021). Prognosticating the effect on Unemployment rate in the post-pandemic India via Time-Series Forecasting and Least Squares Approximation. *Pattern Recognition Letters*, *152*, 172–179. Scopus. https://doi.org/10.1016/j.patrec.2021.10.012 337

Rathore, B., Mahela, O. P., Khan, B., & Padmanaban, S. (2021). Protection scheme using waveletalienation-neural technique for UPFC compensated transmission line. *IEEE Access*, *9*, 13737– 13753. Scopus. https://doi.org/10.1109/ACCESS.2021.3052315 337

Mordal, E., Hanssen, I., Biratu, A. K., & Vatne, S. (2021). Providing safe maternity care under challenging conditions in rural Ethiopia: A qualitative study. *BMC Health Services Research*, 21(1). Scopus. https://doi.org/10.1186/s12913-021-06324-4 338

Zula, A. T., Ayele, D. A., & Egigayhu, W. A. (2021). Proximate composition, antinutritional content, microbial load, and sensory acceptability of noodles formulated from moringa (Moringa oleifera) leaf powder and wheat flour blend. *International Journal of Food Science*, *2021*. Scopus. https://doi.org/10.1155/2021/6689247 339

Mohamed, A., Worku, H., & Kindu, M. (2021). Quantification and mapping of the spatial landscape pattern and its planning and management implications a case study in Addis Ababa and the surrounding area, Ethiopia. *Geology, Ecology, and Landscapes*, *5*(3), 161–172. Scopus. https://doi.org/10.1080/24749508.2019.1701309 340

Abate, S., Belayneh, M., & Ahmed, F. (2021). Reclamation and amelioration of saline-sodic soilusing gypsum and halophytic grasses: Case of Golina-Addisalem irrigation scheme, Raya KoboValley,Ethiopia.CogentFoodandAgriculture,7(1).Scopus.https://doi.org/10.1080/23311932.2020.1859847341

Mahla, R., Khan, B., Mahela, O. P., & Singh, A. (2021). Recognition of complex and multiple power quality disturbances using wavelet packet-based fast kurtogram and ruled decision tree algorithm. *International Journal of Modeling, Simulation, and Scientific Computing, 12*(5). Scopus. https://doi.org/10.1142/S179396232150032X 342

Negash, B., Azerefegne, F., & Ayalew, G. (2021). Regional variation in susceptibility of thrips (Thysanoptera: Thripidae) to insecticides on onion in the Rift Valley of Ethiopia. *International Journal of Tropical Insect Science*, *41*(2), 1579–1584. Scopus. https://doi.org/10.1007/s42690-020-00358-7 342

Agajie, T. F., Khan, B., Guerrero, J. M., & Mahela, O. P. (2021). Reliability enhancement and voltage profile improvement of distribution network using optimal capacity allocation and placement of distributed energy resources. *Computers and Electrical Engineering*, *93*. Scopus. https://doi.org/10.1016/j.compeleceng.2021.107295 343

Tsade Kara, H., Anshebo, S. T., Sabir, F. K., & Adam Workineh, G. (2021). Removal of Methylene Blue Dye from Wastewater Using Periodiated Modified Nanocellulose. *International Journal of Chemical Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/9965452 344

Shumiye, Y. G., Bushra, F. Y., Sirak, E. H., & Wondimagegnehu, M. B. (2021). Renal immature teratoma: A rare entity; A case report and literature review. *Urology Case Reports*, *34*. Scopus. https://doi.org/10.1016/j.eucr.2020.101495 345

Assefa, S., Haile, W., & Tena, W. (2021b). Response of bread wheat to sulfur and phosphorus fertilizers in the north central Ethiopia. *Agriculture and Food Security*, *10*(1). Scopus. https://doi.org/10.1186/s40066-021-00303-y 345

Bang, S., Qamar, A. Y., Tanga, B. M., Fang, X., & Cho, J. (2021). Resveratrol supplementation into extender protects against cryodamage in dog post-thaw sperm. *The Journal of Veterinary Medical Science*, 83(6), 973–980. Scopus. https://doi.org/10.1292/jvms.21-0125
346

Belete, M. D. (2021). Review of the underpinning reasons and field demonstrations to incorporate ecohydrologic strategy into landscape restoration in water-limited ecosystems. *Ecohydrology and Hydrobiology*, *21*(3), 529–542. Scopus. https://doi.org/10.1016/j.ecohyd.2021.08.004 347

Amare, H. H., & Lindtjorn, B. (2021b). Risk factors for scabies, tungiasis, and tinea infections among schoolchildren in southern Ethiopia: A cross-sectional Bayesian multilevel model. *PLoS Neglected Tropical Diseases*, *15*(10). Scopus. https://doi.org/10.1371/JOURNAL.PNTD.0009816 348

Birhanu, Z., Ambelu, A., Fufa, D., Mecha, M., Zeynudin, A., Abafita, J., Belay, A., Doyore, F., Oljira, L., Bacha, E., Feyisa, J., Hadis, Z., Ayele, K., Addisu, Y., Gutu, B., Tesfaye, D., Tilahun, T., Imana, G., Tolosa, T., ... Kebede, Y. (2021). Risk perceptions and attitudinal responses to COVID-19 pandemic: An online survey in Ethiopia. *BMC Public Health*, *21*(1). Scopus. https://doi.org/10.1186/s12889-021-10939-x 349

Wakgari, N., Woyo, T., Kebede, E., Gemeda, H., Gebremedhin, S., & Binu, W. (2021). Risky
Sexual Practice among Street Dwelling People in Southern Ethiopia: A mixed-Method Study. *Ethiopian Journal of Health Sciences*, 31(3), 475–484. Scopus.
https://doi.org/10.4314/ejhs.v31i3.4

Keneni, Y. G., Senbeta, A. F., & Sime, G. (2021). ROLE OF SMALL-SCALE TREES PLANTATION AND FARMERS' ATTITUDE AND SKILL TOWARD PROPAGATION OF INDIGENOUS AND EXOTIC TREES: THE CASE OF SIDAMA, ETHIOPIA. *African Journal of Food, Agriculture, Nutrition and Development, 21*(105), 18804–18823. Scopus. https://doi.org/10.18697/AJFAND.105.19045 351

Dana, E., Asefa, Y., Hirigo, A. T., & Yitbarek, K. (2021). Satisfaction and its associated factors of infants' vaccination service among infant coupled mothers/caregivers at Hawassa city public health centers. *Human Vaccines and Immunotherapeutics*, *17*(3), 797–804. Scopus. https://doi.org/10.1080/21645515.2020.1790278 352

Mony, P. K., Tadele, H., Gobezayehu, A. G., Chan, G. J., Kumar, A., Mazumder, S., Beyene, S. A., Jayanna, K., Kassa, D. H., Mohammed, H. A., Estifanos, A. S., Kumar, P., Jadaun, A. S., Hailu Abay, T., Washington, M., W/gebriel, F., Alamineh, L., Fikre, A., Kumar, A., ... Medhanyie, A. A. (2021). Scaling up Kangaroo Mother Care in Ethiopia and India: A multi-site implementation research study. *BMJ Global Health*, *6*(9). Scopus. https://doi.org/10.1136/bmjgh-2021-005905 353

Abera, W., Haregeweyn, N., Dile, Y., Fenta, A. A., Berihun, M. L., Demissie, B., Mulatu, C. A., Nigussie, T. A., Billi, P., Meaza, H., Woldearegay, K., Melesse, A. M., Moges, S. A., & Tamene, L. (2021). Scientific Misconduct and Partisan Research on the Stability of the Grand Ethiopian

Renaissance Dam: A Critical Review of a Contribution to Environmental Remote Sensing in Egypt(Springer, 2020) (p. 293). Scopus. https://doi.org/10.1007/978-3-030-76437-1\_15StateEyasu, T., Mekuria, S., & Sheferaw, D. (2021). Seasonal prevalence of trypanosomosis, Glossinadensity and infection along the escarpment of Omo River, Loma district, southern Ethiopia.Heliyon, 7(4). Scopus. https://doi.org/10.1016/j.heliyon.2021.e06667355

Wardle, J. M., Fischer, A., Tesfaye, Y., & Smith, J. (2021). Seasonal variability of resources: The unexplored adversary of biogas use in rural Ethiopia. *Current Research in Environmental Sustainability*, *3*. Scopus. https://doi.org/10.1016/j.crsust.2021.100072

Tang, Z., Lin, Y., Vosoogh, M., Parsa, N., Baziar, A., & Khan, B. (2021). Securing Microgrid Optimal Energy Management Using Deep Generative Model. *IEEE Access*, *9*, 63377–63387. Scopus. https://doi.org/10.1109/ACCESS.2021.3074460 357

Tanga, B. M., Qamar, A. Y., Raza, S., Bang, S., Fang, X., Yoon, K., & Cho, J. (2021). Semen evaluation: Methodological advancements in sperm quality-specific fertility assessment—A review. *Animal Bioscience*, *34*(8), 1253–1270. Scopus. https://doi.org/10.5713/ab.21.0072 357 Senbeta, A. F., Supit, I., & Harahagazwe, D. (2021). Sensitivity of potato yield and biomass to climate change effects in Gisozi, Burundi, and Washington, USA, and assessment of LINTUL4 model behavior. *Journal of Agriculture and Environment for International Development*, *115*(1), 5–30. Scopus. https://doi.org/10.12895/jaeid.20211.1132 358

Van der Burg, E., Toet, A., Abbasi, Z., Brouwer, A.-M., Van Erp, J. B. F., Kallen, V. L., Kaneko, D., Kim, Y. E., Kinnear, M., de Kock, H. L., Kusbiantari, D., Lee, T.-R., Liu, Y., Luhovyy, B. L., MacEachern, E., Mezgebe, A. G., Nikolova, R., Olatunde, G., Srisayekti, W., ... Yürek, M. A. (2021). Sequential dependency for affective appraisal of food images. *Humanities and Social Sciences Communications*, 8(1). Scopus. https://doi.org/10.1057/s41599-021-00909-4

Zenebe, M. H., Mekonnen, Z., Loha, E., & Padalko, E. (2021c). Seroprevalence and associated factors of maternal cytomegalovirus in Southern Ethiopia: A cross-sectional study. *BMJ Open*, *11*(10). Scopus. https://doi.org/10.1136/bmjopen-2021-051390 360

Aragaw, K., Regassa, F., Sibhat, B., Abayneh, T., Gelaye, E., Deresse, G., Egan, S., & Asmare, K. (2021). Seroprevalence and association of bovine viral diarrhea virus (BVDV) serostatus with reproductive problems in dairy cattle in central and southern Ethiopia. *Tropical Animal Health and Production*, 53(5). Scopus. https://doi.org/10.1007/s11250-021-02904-y

Atalay, A. A., Abebe, R. K., Dadhi, A. E., & Bededa, W. K. (2021). Seroprevalence of hepatitis B virus among pregnant women attending Antenatal care in Dilla University Referral Hospital Gedio Zone, Ethiopia; Health facility based cross-sectional study. *PLoS ONE*, *16*(3 March). Scopus. https://doi.org/10.1371/journal.pone.0249216

Daka, D., Hailemeskel, G., & Fenta, D. A. (2021). Seroprevalence of hepatitis b virus and associated factors among female sex workers using respondent-driven sampling in hawassa city, ethiopia. *Infection and Drug Resistance*, *14*, 4301–4311. Scopus. https://doi.org/10.2147/IDR.S332333 363

Gunta, M., Tantu, T., Wolka, S., Meskele, M., Ayza, A., & Duko, B. (2021). Sexual and Reproductive Health Services Utilization among Wolaita Sodo University Students, Ethiopia: A Mixed Method Approach. *Scientific World Journal*, 2021. Scopus. https://doi.org/10.1155/2021/2415023 364

Pachauri, R. K., Bai, J., Kansal, I., Mahela, O. P., & Khan, B. (2021). Shade dispersion methodologies for performance improvement of classical total cross-tied photovoltaic array configuration under partial shading conditions. *IET Renewable Power Generation*, *15*(8), 1796–1811. Scopus. https://doi.org/10.1049/rpg2.12147 365

Teferra, T. F. (2021b). Should we still worry about the safety of GMO foods? Why and why not?A review. Food Science and Nutrition, 9(9), 5324–5331.Scopus.https://doi.org/10.1002/fsn3.2499366

Nasab, M. A., Zand, M., Padmanaban, S., Dragicevic, T., & Khan, B. (2021). Simultaneous longterm planning of flexible electric vehicle photovoltaic charging stations in terms of load response and technical and economic indicators. *World Electric Vehicle Journal*, *12*(4). Scopus. https://doi.org/10.3390/wevj12040190 366

Rao, S. P. N., Minckas, N., Medvedev, M. M., Gathara, D., Y N, P., Seifu Estifanos, A., Silitonga,
A. C., Jadaun, A. S., Adejuyigbe, E. A., Brotherton, H., Arya, S., Gera, R., Ezeaka, C. V., Gai, A.,
Gobezayehu, A. G., Dube, Q., Kumar, A., Naburi, H., Chiume, M., ... Lawn, J. E. (2021). Small
and sick newborn care during the COVID-19 pandemic: Global survey and thematic analysis of
healthcare providers' voices and experiences. BMJ Global Health, 6(3). Scopus.
https://doi.org/10.1136/bmjgh-2020-004347

Mergia, M. T., Weldemariam, E. D., Eklo, O. M., & Yimer, G. T. (2021). Small-scale Farmer Pesticide Knowledge and Practice and Impacts on the Environment and Human Health in Ethiopia.

Journal of Health and Pollution, 11(30), 1–19. Scopus. https://doi.org/10.5696/2156-9614-11.30.210607 368

Wassie, Y. T., & Adaramola, M. S. (2021b). Socio-economic and environmental impacts of rural electrification with Solar Photovoltaic systems: Evidence from southern Ethiopia. Energy for Sustainable Development, 60, 52-66. Scopus. https://doi.org/10.1016/j.esd.2020.12.002 369 Kibr, G., Mulugeta, A., & Bosha, T. (2021). Socio-economic Variables Associated with Motivational Barriers of Food Choice among Lactating Women from Central Ethiopia: A Crosssectional Study. Ecology of Food and Nutrition, 60(3),276-303. Scopus. 370 https://doi.org/10.1080/03670244.2020.1845164

Wolka, K., Biazin, B., Martinsen, V., & Mulder, J. (2021a). Soil and water conservation management on hill slopes in Southwest Ethiopia. I. Effects of soil bunds on surface runoff, erosion and loss of nutrients. *Science of the Total Environment*, 757. Scopus. https://doi.org/10.1016/j.scitotenv.2020.142877

Wolka, K., Biazin, B., Martinsen, V., & Mulder, J. (2021b). Soil and water conservation management on hill slopes in southwest Ethiopia. II. Modeling effects of soil bunds on surface runoff and maize yield using AquaCrop. *Journal of Environmental Management*, 296. Scopus. https://doi.org/10.1016/j.jenvman.2021.113187 372

Teshome, A., Halefom, A., Teshome, M., Ahmad, I., Taddele, Y., Dananto, M., Demisse, S., & Szucs, P. (2021). Soil erosion modelling using GIS and revised universal soil loss equation approach: A case study of Guna-Tana landscape, Northern Ethiopia. *Modeling Earth Systems and Environment*, 7(1), 125–134. Scopus. https://doi.org/10.1007/s40808-020-00864-0 373

Wolka, K., Biazin, B., Martinsen, V., & Mulder, J. (2021c). Soil organic carbon and associated soil properties in Enset (Ensete ventricosum Welw. Cheesman)-based homegardens in Ethiopia. *Soil and Tillage Research*, 205. Scopus. https://doi.org/10.1016/j.still.2020.104791 373

Astatkie, H., Ambelu, A., & Beyene, E. M. (2021). Sources and level of heavy metal contamination in the water of Awetu watershed streams, southwestern Ethiopia. *Heliyon*, 7(3). Scopus. https://doi.org/10.1016/j.heliyon.2021.e06385 374

Hessebo, M. T., Woldeamanuel, T., & Tadesse, M. (2021). Spatial and temporal climate variability and change in the bilate catchment, central Rift Valley lakes region, Ethiopia. *Physical Geography*, *42*(3), 199–225. Scopus. https://doi.org/10.1080/02723646.2019.1698094 375

Aragaw, G., Chala, A., & Terefe, H. (2021). Spatial distribution and association of factors influencing sorghum anthracnose (Colletotrichum sublineolum) epidemics in Eastern Ethiopia. *International Journal of Pest Management*, 67(1), 20–31. Scopus. https://doi.org/10.1080/09670874.2019.1668075

AkliluToma, S., Senbeta, B. A., & Bezabih, A. A. (2021). Spatial Distribution of Road Traffic Accident at Hawassa City Administration, Ethiopia. *Ethiopian Journal of Health Sciences*, *31*(4), 793–806. Scopus. https://doi.org/10.4314/ejhs.v31i4.14
376

Toma, S. A., Eneyew, B. W., & Taye, G. A. (2021). Spatial Modelling of Risk Factors for Malaria Prevalence in SNNP Regional State, Ethiopia. *Ethiopian Journal of Health Sciences*, *31*(4), 731– 742. Scopus. https://doi.org/10.4314/ejhs.v31i4.7 377

Habte, A., Mamo, G., Worku, W., Ayalew, D., & Gayler, S. (2021). Spatial Variability and Temporal Trends of Climate Change in Southwest Ethiopia: Association with Farmers' Perception and Their Adaptation Strategies. *Advances in Meteorology*, 2021. Scopus. https://doi.org/10.1155/2021/3863530
378

Wolka, K., Biazin, B., Martinsen, V., & Mulder, J. (2021d). Spatial variation in soil properties and crop yield on stone bund terraces in southwest Ethiopia. *Soil Use and Management*. Scopus. https://doi.org/10.1111/sum.12777 379

Belayneh, M., Loha, E., & Lindtjørn, B. (2021). Spatial variation of child stunting and maternal malnutrition after controlling for known risk factors in a drought-prone rural community in Southern Ethiopia. *Annals of Global Health*, 87(1). Scopus. https://doi.org/10.5334/aogh.3286 380

Gashure, S., & Wana, D. (2021). Spatiotemporal climate variability and trends in UNESCO designated Cultural Landscapes of Konso, Ethiopia. *African Geographical Review*. Scopus. https://doi.org/10.1080/19376812.2021.1997611 381

Legesse, A., & Negash, M. (2021). Species diversity, composition, structure and management in agroforestry systems: The case of Kachabira district, Southern Ethiopia. *Heliyon*, 7(3). Scopus. https://doi.org/10.1016/j.heliyon.2021.e06477 382

Delelegn, D., Tolcha, A., Beyene, H., & Tsegaye, B. (2021). Status of active trachoma infection among school children who live in villages of open field defecation: A comparative cross-sectional study. *BMC Public Health*, *21*(1). Scopus. https://doi.org/10.1186/s12889-021-12106-8 383

Degsera, A., Minwyelet, M., & Yosef, T. G. (2021). Stock assessment of Nile tilapia Oreochromis niloticus (Linnaeus 1758) in Lake Tana, Ethiopia. *African Journal of Aquatic Science*, *46*(4), 499–507. Scopus. https://doi.org/10.2989/16085914.2021.1922349 384

Ponraj Sankar, L., Aruna, G., Sathish, T., Parthiban, A., Vijayan, V., Dinesh Kumar, S., Rajkumar, S., Mekonnen, A., & Tufa, M. (2021). Strength Enhancement Study on Composites of AA6066
Aluminium Alloy with Magnesium Oxide and Coal Ash. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/2810106
385

Tilahun, B., Gashu, K. D., Mekonnen, Z. A., Endehabtu, B. F., Asressie, M., Minyihun, A., Mamuye, A., Atnafu, A., Ayele, W., Gutema, K., Abera, A., Abera, M., Gebretsadik, T., Abate, B., Mohammed, M., Animut, N., Belay, H., Alemu, H., Denboba, W., ... Tadesse, L. (2021).
Strengthening the national health information system through a capacity-building and mentorship partnership (CBMP) programme: A health system and university partnership initiative in Ethiopia. *Health Research Policy and Systems*, *19*(1). Scopus. https://doi.org/10.1186/s12961-021-00787-x 385

Zeleke, M. A., Dintwa, E., & Nwaigwe, K. N. (2021). Stress intensity factor computation of inclined cracked tension plate using xfem. *Engineering Solid Mechanics*, *9*(4), 363–376. Scopus. https://doi.org/10.5267/J.ESM.2021.7.002 387

Noulèkoun, F., Birhane, E., Mensah, S., Kassa, H., Berhe, A., Gebremichael, Z. M., Adem, N. M., Seyoum, Y., Mengistu, T., Lemma, B., Hagazi, N., & Abrha, H. (2021). Structural diversity consistently mediates species richness effects on aboveground carbon along altitudinal gradients in northern Ethiopian grazing exclosures. *Science of the Total Environment*, 776. Scopus. https://doi.org/10.1016/j.scitotenv.2021.145838 387

Markos, M., Kefyalew, B., & Tesfaye, H. B. (2021). Studies on the prevalence of blindness in Ethiopia: A protocol for the systematic review and meta-analysis. *BMJ Open Ophthalmology*, 6(1).
Scopus. https://doi.org/10.1136/bmjophth-2021-000881

Tufa, M., Tafesse, D., Tolosa, S., & Murgan, S. (2021). Study of sand-plastic composite using optimal mixture design of experiments for best compressive strength. 47, 480–487. Scopus. https://doi.org/10.1016/j.matpr.2021.05.031\_Conference )

Sathish, T., Mohanavel, V., Karthick, A., Arunkumar, M., Ravichandran, M., & Rajkumar, S. (2021). Study on Compaction and Machinability of Silicon Nitride (Si3N4) Reinforced Copper

Alloy Composite through P/M Route. International Journal of Polymer Science, 2021. Scopus.https://doi.org/10.1155/2021/7491679390

Afework, E., Mengesha, S., & Wachamo, D. (2021). Stunting and Associated Factors amongUnder-Five-Age Children in West Guji Zone, Oromia, Ethiopia. Journal of Nutrition andMetabolism, 2021. Scopus. https://doi.org/10.1155/2021/8890725391

Wolde Hawariat, B. Y., Fenta, B. D., & Gebreselassie, H. A. (2021). Subcutaneous chest wall hamartoma: Case report. *Journal of Pediatric Surgery Case Reports*, 73. Scopus. https://doi.org/10.1016/j.epsc.2021.102009
392

Abate, D. A., Ayele, M. H., & Mohammed, A. B. (2021). Subcutaneous mycoses in Ethiopia: A retrospective study in a single dermatology center. Transactions of the Royal Society of Tropical Medicine and Hygiene, 115(12), 1468–1470. Scopus. https://doi.org/10.1093/trstmh/trab080 393 Sartorius, B., VanderHeide, J. D., Yang, M., Goosmann, E. A., Hon, J., Haeuser, E., Cork, M. A., Perkins, S., Jahagirdar, D., Schaeffer, L. E., Serfes, A. L., LeGrand, K. E., Abbastabar, H., Abebo, Z. H., Abosetugn, A. E., Abu-Gharbieh, E., Accrombessi, M. M. K., Adebayo, O. M., Adegbosin, A. E., ... Dwyer-Lindgren, L. (2021). Subnational mapping of HIV incidence and mortality among individuals aged 15-49 years in sub-Saharan Africa, 2000-18: A modelling study. The Lancet HIV, 8(6), e363-e375. Scopus. https://doi.org/10.1016/S2352-3018(21)00051-5 393 Ayalew, M., Defar, S., & Reta, Y. (2021). Suicide behavior and its predictors in patients with schizophrenia in ethiopia. Schizophrenia Research and Treatment, 2021. Scopus. https://doi.org/10.1155/2021/6662765 395

Bang, S., Tanga, B. M., Qamar, A. Y., Fang, X., Seong, G., Talha Nabeel, A. H., Yu, I., & Cho, J. (2021). Supplementation of cryoprotective extender with resveratrol decreases apoptosis index and reactive oxygen species levels in post-thaw dog sperm. *Korean Journal of Veterinary Research*, 61(4). Scopus. https://doi.org/10.14405/kjvr.2021.61.e29

Dessie, Y., Tadesse, S., & Eswaramoorthy, R. (2021). Surface Roughness and Electrochemical Performance Properties of Biosynthesized α -MnO2/NiO-Based Polyaniline Ternary Composites as Efficient Catalysts in Microbial Fuel Cells. *Journal of Nanomaterials*, 2021. Scopus. https://doi.org/10.1155/2021/7475902 396

Abate, S. M., Assen, S., Yinges, M., & Basu, B. (2021). Survival and predictors of mortality among patients admitted to the intensive care units in southern Ethiopia: A multi-center cohort study. *Annals of Medicine and Surgery*, 65. Scopus. https://doi.org/10.1016/j.amsu.2021.102318 397

Abrham, T., Beshir, H. M., & Haile, A. (2021). Sweetpotato production practices, constraints, and variety evaluation under different storage types. *Food and Energy Security*, *10*(1). Scopus. https://doi.org/10.1002/fes3.263 398

Dubale, D. G., Abshiro, T. A., & Hone, F. G. (2021). Synthesis and characterization of copper zinc sulfide (Cuxzn1-xs) ternary thin film by using acidic chemical bath deposition method. *International Journal of Thin Film Science and Technology*, *10*(1), 21–27. Scopus. https://doi.org/10.18576/ijtfst/100104 399

Ayano, G., Belete, A., Duko, B., Tsegay, L., & Dachew, B. A. (2021). Systematic review and meta-analysis of the prevalence of depressive symptoms, dysthymia and major depressive disorders among homeless people. *BMJ Open*, *11*(2). Scopus. https://doi.org/10.1136/bmjopen-2020-040061 400

Rajkumar, S., Arulmurugan, B., Mulugeta, L., Mekonnen, A., Tafesse, D., & Teklemariam, A.(2021). Taguchi optimization of drilling process parameters on LM13/10 wt%Graphenecomposites made by stir casting process. 47, 431–436.Scopus.https://doi.org/10.1016/j.matpr.2021.04.603401

Kirschel, A. N. G., Moysi, M., Lukhele, S. M., Sebastianelli, M., Asfaw, T., Hadjioannou, L., Mortega, K. G., Monadjem, A., & Moyle, R. G. (2021). Taxonomic revision of the Red-fronted Tinkerbird Pogoniulus pusillus (Dumont, 1816) based on molecular and phenotypic analyses. *Bulletin of the British Ornithologists' Club*, 141(4), 428–442. Scopus. https://doi.org/10.25226/bboc.v141i4.2021.a6 401

Erena, O. T., Kalko, M. M., & Debele, S. A. (2021). Technical efficiency, technological progress and productivity growth of large and medium manufacturing industries in Ethiopia: A data envelopment analysis. *Cogent Economics and Finance*, 9(1). Scopus. https://doi.org/10.1080/23322039.2021.1997160 402

Mamo, K., Siyoum, M., & Birhanu, A. (2021). Teenage pregnancy and associated factors in Ethiopia: A systematic review and meta-analysis. *International Journal of Adolescence and Youth*, 26(1), 501–512. Scopus. https://doi.org/10.1080/02673843.2021.2010577
403

Allen Jeffrey, J., Ravikumar, M. M., Ashraff Ali, K. S., Vishnu Kumar, R., Rajkumar, S., &Pugazhendhi, L. (2021). Tensile and flexural properties of natural fibre matrix compositesdevelopedthroughhand-laymethod.47,400–404.Scopus.https://doi.org/10.1016/j.matpr.2021.04.594404

Bedaso, A., Adams, J., Peng, W., & Sibbritt, D. (2021c). The association between social support and antenatal depressive and anxiety symptoms among Australian women. *BMC Pregnancy and Childbirth*, 21(1). Scopus. https://doi.org/10.1186/s12884-021-04188-4 404

Tessema, G. A., Kinfu, Y., Dachew, B. A., Tesema, A. G., Assefa, Y., Alene, K. A., Aregay, A.
F., Ayalew, M. B., Bezabhe, W. M., Bali, A. G., Dadi, A. F., Duko, B., Erku, D., Gebrekidan, K.,
Gebremariam, K. T., Gebremichael, L. G., Gebreyohannes, E. A., Gelaw, Y. A., Gesesew, H. A.,
... Tesfay, F. H. (2021). The COVID-19 pandemic and healthcare systems in Africa: A scoping
review of preparedness, impact and response. *BMJ Global Health*, 6(12). Scopus.
https://doi.org/10.1136/bmjgh-2021-007179

Birhanu, Z. K., Mengesha, T., & Salgado, A. J. (2021). The Darcy problem with porosity depending exponentially on the pressure. *Journal of Computational and Applied Mathematics*, *398*. Scopus. https://doi.org/10.1016/j.cam.2021.113642 407

Yeshaneh, A., Kassa, A., Kassa, Z. Y., Adane, D., Fikadu, Y., Wassie, S. T., Alemu, B. W., Tadese, M., Shitu, S., & Abebe, H. (2021). The determinants of 5th minute low Apgar score among newborns who delivered at public hospitals in Hawassa City, South Ethiopia. *BMC Pediatrics*, 21(1). Scopus. https://doi.org/10.1186/s12887-021-02745-6

Kim, T., Riaz, M. N., Awika, J., & Teferra, T. F. (2021). The effect of cooling and rehydration methods in high moisture meat analogs with pulse proteins-peas, lentils, and faba beans. *Journal of Food Science*, *86*(4), 1322–1334. Scopus. https://doi.org/10.1111/1750-3841.15660 408
Desalegn, T. A., Gebremedhin, S., Alemayehu, F. R., & Stoecker, B. J. (2021). The effect of school feeding programme on class absenteeism and academic performance of schoolchildren in Southern Ethiopia: A prospective cohort study. *Public Health Nutrition*, *24*(10), 3066–3074. Scopus. https://doi.org/10.1017/S1368980021000501 409

Abera, M., Tolera, A., Nurfeta, A., & Geleti, D. (2021b). The Effect of Supplementation of Vetch (Vicia villosa) on Performance of Arsi-Bale Sheep Fed Basal diet of Desho (Pennisetum pedicellatum) grass. *Acta Agriculturae Scandinavica A: Animal Sciences*, 70(3–4), 123–131. Scopus. https://doi.org/10.1080/09064702.2021.1976264 410

Lengyel, C. G., Hussain, S., Trapani, D., El Bairi, K., Altuna, S. C., Seeber, A., Odhiambo, A., Habeeb, B. S., & Seid, F. (2021). The emerging role of liquid biopsy in gastric cancer. *Journal of Clinical Medicine*, *10*(10). Scopus. https://doi.org/10.3390/jcm10102108 411 Menuta, F. (2021). *The ensete in Gurage: Nomenclature, use and meaning extension* (Vol. 48, p. 61). Scopus. https://doi.org/10.1075/impact.48.02men 412

Gebre, G. G., Mawia, H., Makumbi, D., & Rahut, D. B. (2021). The impact of adopting stresstolerant maize on maize yield, maize income, and food security in Tanzania. *Food and Energy Security*, *10*(4). Scopus. https://doi.org/10.1002/fes3.313 413

Bulti, A. T. (2021). The Influence of Dam Construction on the Catchment Hydrologic Behavior and its Effects on a Discharge Forecast in Hydrological Models. *Water Resources Management*, *35*(6), 2023–2037. Scopus. https://doi.org/10.1007/s11269-021-02829-z 414

Ferreira, M. S., Jones, M. R., Callahan, C. M., Farelo, L., Tolesa, Z., Suchentrunk, F., Boursot, P., Mills, L. S., Alves, P. C., Good, J. M., & Melo-Ferreira, J. (2021). The Legacy of Recurrent Introgression during the Radiation of Hares. *Systematic Biology*, *70*(3), 593–607. Scopus. https://doi.org/10.1093/sysbio/syaa088

Lukas, K., Markos, E., Belayneh, F., & Habte, A. (2021). The magnitude of hypertension and associated factors among clients on highly active antiretroviral treatment in Southern Ethiopia, 2020: A hospital-based cross-sectional study. *PLoS ONE*, *16*(10 October). Scopus. https://doi.org/10.1371/journal.pone.0258576 415

Boshe, B. D., Yimar, G. N., Dadhi, A. E., & Bededa, W. K. (2021). The magnitude of nonadherence and contributing factors among adult outpatient with Diabetes Mellitus in Dilla University Referral Hospital, Gedio, Ethiopia. *PLoS ONE*, *16*(3 March). Scopus. https://doi.org/10.1371/journal.pone.0247952 416

Bedaso, A., Adams, J., Peng, W., & Sibbritt, D. (2021d). The mediational role of social support in the relationship between stress and antenatal anxiety and depressive symptoms among Australian women: A mediational analysis. *Reproductive Health*, 18(1). Scopus. https://doi.org/10.1186/s12978-021-01305-6 417

Dejene, M., & Cochrane, L. (2021). The Power of Policy and the Entrenchment of Inequalities in Ethiopia: Reframing Agency in the Global Land Rush (p. 234). Scopus. https://doi.org/10.1007/978-3-030-60789-0\_9 419

Duko, B., Mekuriaw, B., Molla, A., & Ayano, G. (2021). The prevalence of premenstrual dysphoric disorder among adolescents in Ethiopia: A systematic review and meta-analysis. *Irish Journal of Medical Science*, *190*(1), 419–427. Scopus. https://doi.org/10.1007/s11845-020-02275-7

Bedaso, A., Adams, J., Peng, W., & Sibbritt, D. (2021e). The relationship between social support and mental health problems during pregnancy: A systematic review and meta-analysis. Reproductive Health, 18(1). Scopus. https://doi.org/10.1186/s12978-021-01209-5 420 Kuraz, B., Tolera, A., & Abebe, A. (2021). The Role of Bole (Lake Soil) as a Mineral Supplement to Arsi-Bale Sheep Fed Natural Grass Hay and Concentrate Supplement. Agricultural Science Digest, 41(4), 638–643. Scopus. https://doi.org/10.18805/ag.D-310 421 Qamar, A. Y., Hussain, T., Rafique, M. K., Bang, S., Tanga, B. M., Seong, G., Fang, X., Saadeldin, I. M., & Cho, J. (2021). The role of stem cells and their derived extracellular vesicles in restoring female and male fertility. Cells, 10(9). Scopus. https://doi.org/10.3390/cells10092460 422 Mohanavel, V., Ashraff Ali, K. S., Ranganathan, K., Allen Jeffrey, J., Ravikumar, M. M., & Rajkumar, S. (2021). The roles and applications of additive manufacturing in the aerospace and automobile sector. 47, 405–409. Scopus. https://doi.org/10.1016/j.matpr.2021.04.596 423 Teklemariam, A. T., & Cochrane, L. (2021). The rush to the peripheries: Land rights and tenure security in Peri-Urban Ethiopia. Land, 10(2), 1-20. Scopus. https://doi.org/10.3390/land10020193 424

Stark, H., Omer, A., Wereme N'Diaye, A., Sapp, A. C., Moore, E. V., & McKune, S. L. (2021).
The Un Oeuf study: Design, methods and baseline data from a cluster randomised controlled trial to increase child egg consumption in Burkina Faso. *Maternal and Child Nutrition*, *17*(1). Scopus.
https://doi.org/10.1111/mcn.13069 425

Cochrane, L. (2021). The United Arab Emirates as a global donor: What a decade of foreign aiddata transparency reveals. Development Studies Research, 8(1), 49–62. Scopus.https://doi.org/10.1080/21665095.2021.1883453425

Gezhagn, T. M., Temam, A. G., & Lelisho, T. A. (2021). Theoretical study on chemical fixation of carbon dioxide with aziridine into cyclic carbamate catalysed by purine/HI system. *Molecular Physics*, *119*(5). Scopus. https://doi.org/10.1080/00268976.2020.1831637
426

Hua, H., & Wondirad, A. (2021). Tourism network in urban agglomerated destinations: Implications for sustainable tourism destination development through a critical literature review. *Sustainability (Switzerland)*, *13*(1), 1–16. Scopus. https://doi.org/10.3390/su13010285 427

Dasa, T. T., Geta, T. G., Yalew, A. Z., Abebe, R. M., & Kele, H. U. (2021). Toxoplasmosis infection among pregnant women in Africa: A systematic review and meta-analysis. *PLoS ONE*, *16*(7 July). Scopus. https://doi.org/10.1371/journal.pone.0254209 428

Galles, N. C., Liu, P. Y., Updike, R. L., Fullman, N., Nguyen, J., Rolfe, S., Sbarra, A. N., Schipp, M. F., Marks, A., Abady, G. G., Abbas, K. M., Abbasi, S. W., Abbastabar, H., Abd-Allah, F., Abdoli, A., Abolhassani, H., Abosetugn, A. E., Adabi, M., Adamu, A. A., ... Yuce, D. (2021). Measuring routine childhood vaccination coverage in 204 countries and territories, 1980–2019: A systematic analysis for the Global Burden of Disease Study 2020, Release 1. *The Lancet*, *398*(10299), 503–521. Scopus. https://doi.org/10.1016/S0140-6736(21)00984-3
Woldesemayat, E. M., & Azeze, Z. (2021). Treatment outcome of tuberculosis at Dilla Referral

Hospital, Gedeo Zone, southern Ethiopia: A retrospective study. *PLoS ONE*, *16*(4 April). Scopus. https://doi.org/10.1371/journal.pone.0249369 430

Wondimu, M. T., Nigussie, Z. A., & Yusuf, M. M. (2021). Tree species diversity predicts aboveground carbon storage through functional diversity and functional dominance in the dry evergreen Afromontane forest of Hararghe highland, Southeast Ethiopia. *Ecological Processes*, 10(1). Scopus. https://doi.org/10.1186/s13717-021-00322-4

Bovas Herbert Bejaxhin, A., Balamurugan, G. M., Sivagami, S. M., Ramkumar, K., Vijayan, V., & Rajkumar, S. (2021). Tribological Behavior and Analysis on Surface Roughness of CNC Milled
Dual Heat Treated Al6061 Composites. *Advances in Materials Science and Engineering*, 2021.
Scopus. https://doi.org/10.1155/2021/3844194

Woldesemayat, E. M. (2021b). Tuberculosis in migrants is among the challenges of tuberculosis control in high-income countries. *Risk Management and Healthcare Policy*, *14*, 2965–2970.
Scopus. https://doi.org/10.2147/RMHP.S314777
433

Chaka, D. S., & Oda, T. K. (2021). Understanding land surface temperature on rift areas to examine the spatial variation of urban heat island: The case of Hawassa, southern Ethiopia. *GeoJournal*, 86(2), 993–1014. Scopus. https://doi.org/10.1007/s10708-019-10110-5 434

Joshi, S., Stalin, S., Shukla, P. K., Shukla, P. K., Bhatt, R., Bhadoria, R. S., & Tiwari, B. (2021). Unified Authentication and Access Control for Future Mobile Communication-Based Lightweight IoT Systems Using Blockchain. *Wireless Communications and Mobile Computing*, 2021. Scopus. https://doi.org/10.1155/2021/8621230 434

Asefa, A. (2021). Unveiling respectful maternity care as a way to address global inequities in maternal health. *BMJ Global Health*, *6*(1). Scopus. https://doi.org/10.1136/bmjgh-2020-003559 436

Almebo, A., Mangasha, H. B., Ashuro, Z., Soboksa, N. E., Kanno, G. G., Negassa, B., Mangasha, A. E., Ayinalem, A. E., & Aregu, M. B. (2021). Utilization of Community-Level Fluoride-Filtered Water and its Associated Factors in Dugda Woreda of East Shewa Zone, Oromia Region, Ethiopia. *Environmental Health Insights*, *15*. Scopus. https://doi.org/10.1177/11786302211052384
Muluneh, A. A., Kassa, Z. Y., Mamo, Z. B., & Hadra, N. (2021). Utilization utilization of of antenatal antenatal care care and and associated associated factors factors in in gedeo gedeo zone,

zone, southern southern Ethiopia Ethiopia. *Ethiopian Journal of Reproductive Health*, *13*(1), 40–49. Scopus.

Borrell, J. S., Gebremariam, Z., & Abebe, W. M. (2021). Utilize existing genetic diversity before genetic modification in indigenous crops. *Nature Biotechnology*, *39*(9), 1064–1065. Scopus. https://doi.org/10.1038/s41587-021-01048-6 438

Woldemedihn, G. M., Rueegg, C. S., Desalegn, H., Aberra, H., Berhe, N., & Johannessen, A. (2021). Validity of a point-of-care viral load test for hepatitis B in a low-income setting. *Journal of Virological Methods*, 289. Scopus. https://doi.org/10.1016/j.jviromet.2020.114057
439

Pace, R. M., Williams, J. E., Robertson, B., Lackey, K. A., Meehan, C. L., Price, W. J., Foster, J. A., Sellen, D. W., Kamau-Mbuthia, E. W., Kamundia, E. W., Mbugua, S., Moore, S. E., Prentice, A. M., Kita, D. G., Kvist, L. J., Otoo, G. E., Ruiz, L., Rodríguez, J. M., Pareja, R. G., ... McGuire, M. K. (2021). Variation in human milk composition is related to differences in milk and infant fecal microbial communities. *Microorganisms*, 9(6). Scopus. https://doi.org/10.3390/microorganisms9061153 440

Abza, T. (2021). Verbal derivations in Inor (Vol. 48, p. 300). Scopus.https://doi.org/10.1075/impact.48.12abz441

Nigusse, T., & Gebretsadik, A. (2021). Vitamin A Supplementation Coverage and Ocular Signs among Children Aged 6-59 Months in Aleta Chuko Woreda, Sidama Zone, Southern Ethiopia. *Journal of Nutrition and Metabolism*, 2021. Scopus. https://doi.org/10.1155/2021/8878703 441
Mishra, P., Aggarwal, P., Vidyarthi, A., Singh, P., Khan, B., Alhelou, H. H., & Siano, P. (2021).
VMShield: Memory Introspection-Based Malware Detection to Secure Cloud-Based Services against Stealthy Attacks. *IEEE Transactions on Industrial Informatics*, 17(10), 6754–6764.
Scopus. https://doi.org/10.1109/TII.2020.3048791 442

Mekuyie, M. (2021). Vulnerability of rural households to climate-induced shocks in Lokka Abaya district, Sidama zone, southern Ethiopia. *Jamba: Journal of Disaster Risk Studies*, *13*(1), 1–11. Scopus. https://doi.org/10.4102/jamba.v13i1.1051 443

Ketema, A., & Dwarakish, G. S. (2021b). Water erosion assessment methods: A review. ISHJournalofHydraulicEngineering,27(4),434–441.Scopus.https://doi.org/10.1080/09715010.2019.1567398444

Rathore, B., Mahela, O. P., Khan, B., Alhelou, H. H., & Siano, P. (2021). Wavelet-Alienation-Neural-Based Protection Scheme for STATCOM Compensated Transmission Line. IEEETransactionsonIndustrialInformatics,17(4),2557–2565.Scopus.https://doi.org/10.1109/TII.2020.3001063445

Sathish, T., Tharmalingam, S., Mohanavel, V., Ashraff Ali, K. S., Karthick, A., Ravichandran, M., & Rajkumar, S. (2021). Weldability Investigation and Optimization of Process Variables for TIG-Welded Aluminium Alloy (AA 8006). *Advances in Materials Science and Engineering*, 2021.
Scopus. https://doi.org/10.1155/2021/2816338

Estifanos, T., Polyakov, M., Pandit, R., Hailu, A., & Burton, M. (2021). What are tourists willing to pay for securing the survival of a flagship species? The case of protection of the Ethiopian wolf. *Tourism Economics*, *27*(1), 45–69. Scopus. https://doi.org/10.1177/1354816619880430 446 Fikre, R., Eshetu, K., Berhanu, M., & Alemayehu, A. (2021). What determines client satisfaction on labor and delivery service in Ethiopia? Systematic review and meta-analysis. *PLoS ONE*, *16*(4 April). Scopus. https://doi.org/10.1371/journal.pone.0249995 447

Gebre, G. G., Isoda, H., Amekawa, Y., Rahut, D. B., Nomura, H., & Watanabe, T. (2021c). What Explains Gender Gaps in Household Food Security? Evidence from Maize Farm Households in Southern Ethiopia. *Social Indicators Research*, *155*(1), 281–314. Scopus. https://doi.org/10.1007/s11205-020-02600-8 448

Cochrane, L., & Oloruntoba, S. O. (2021). Whose voice matters in the teaching and learning of IPE? Implications for policy and policy making. *Policy and Society*, *40*(4), 545–564. Scopus. https://doi.org/10.1080/14494035.2021.1975220 448

Gesesse, E., Fekadu, S. A., & Belete, G. T. (2021). Willingness of corneal donation and itsassociated factors among adult patients attending Gondar University Comprehensive andSpecializedHospital.PLoSONE,16(8August).Scopus.https://doi.org/10.1371/journal.pone.0256102449

Mulugeta, H., Tamene, A., Ashenafi, T., Thygerson, S. M., & Baxter, N. D. (2021). Workplace stress and associated factors among vehicle repair workers in Hawassa City, Southern Ethiopia. *PLoS ONE*, *16*(4 April). Scopus. https://doi.org/10.1371/journal.pone.0249640
Ayalew, T., Yoseph, T., Petra, H., & Cadisch, G. (2021). Yield response of field-grown cowpea varieties to Bradyrhizobium inoculation. *Agronomy Journal*, *113*(4), 3258–3268. Scopus. https://doi.org/10.1002/agj2.20763
451

Srinivasan, D., Meignanamoorthy, M., Ravichandran, M., Mohanavel, V., Alagarsamy, S. V., Chanakyan, C., Sakthivelu, S., Karthick, A., Prabhu, T. R., & Rajkumar, S. (2021). 3D Printing Manufacturing Techniques, Materials, and Applications: An Overview. Advances in Materials Science and Engineering, 2021. Scopus. https://doi.org/10.1155/2021/5756563

### Abstract

3D printing, also called additive manufacturing (AM), is a method of creating 3D solid parts from a digital document. By utilizing additive routes, the fabrication of 3D-printed objects can be made. These layers can be viewed as a gently cut level cross-area of the manifest object. 3D printing is somewhat in obstruction to subtractive manufacture, which is expelling/discharging out a touch of metal or plastic for the occurrence of a milling machine. 3D printing authorizes creating multifarious profiles employing fewer materials than conventional fabrication systems. This review article provides the general idea of 3D printing production techniques, materials used, and applications in the aircraft and automobile industry and biomedical fields. © 2021 D. Srinivasan et al.

Redi, M., Dananto, M., & Thillaigovindan, N. (2021). A Bi-level Neuro-Fuzzy System Soft Computing for Reservoir Operation. *International Journal of Advances in Soft Computing and Its Applications*, 13(3), 223–247. Scopus. https://doi.org/10.15849/IJASCA.211128.15

### Abstract

Reservoir operation studies purely based on the storage level, inflow, and release decisions during dry periods only fail to serve the optimal reservoir operation policy design because of the fact that the release decision during this period is highly dependent on wet season water conservation and flood risk management operations. Imperatively, the operation logic in the two seasons are quite different. If the two operations are not sufficiently coordinated, they may produce poor responses to the system dynamics. There are high levels of uncertainties on the model parameters, values and how they are logically operated by human or automated systems. Soft computing methods represent the system as an artificial neural network (ANN) in which the input-output relations take the form of fuzzy numbers, fuzzy arithmetic and fuzzy logic (FL). Neuro-Fuzzy System (NFS) soft computing combine the approaches of FL and ANN for single

purpose reservoir operation. Thus, this study proposes a Bi-Level Neuro-Fuzzy System (BL-NFS) soft computing methodology for short and long term operation policies for a newly inaugurated irrigation project in Gidabo Watershed of Main Ethiopian Rift Valley Basin. © Al-Zaytoonah University of Jordan (ZUJ).

## Yu, B., You, W., Fan, D.-M., Su, Y., & Nigatu, Z. M. (2021). A comparison of GRACE temporal gravity field models recovered with different processing details. *Geophysical Journal International*, 227(2), 1392–1417. Scopus. <u>https://doi.org/10.1093/gji/ggab279</u>

### Abstract

The Gravity Recovery and Climate Experiment (GRACE) mission has been providing abundant information regarding the mass changes of the Earth in terms of time-series of temporal gravity field models since 2002. To derive temporal gravity field models with high accuracy, many methods have been developed. In this paper, we focus on the variational equation integration approach. The main works can be summarized as follows: (1) analysing the quality of GRACE Level1B RL02 and RL03 data, including accelerometer observations (ACC1B), star camera measurements (SCA1B) and K-Band low-low Satellite-to-Satellite Tracking (SST) range-rate (KBRR) data (KBR1B); (2) discussing the influence of arc-specific parameters and arc length on gravity field recovery and (3) comparing two different methods used for sensitivity matrix generation, namely, a numerical integration method and the method of variation of constants, from the perspectives of accuracy and efficiency, respectively. Based on these analyses, discussions and comparisons, a new time-series of GRACE monthly gravity field models in terms of spherical harmonic coefficients completed to degree and order 60, called SWJTU-GRACE-RL02p, was derived by using the modified variational equation integration approach bashed on GRACE Level1B RL03 data, covering the period from April 2002 to October 2011 with some gaps in between due to poor quality or missing GRACE data. Thus we are looking at the results some 10yrs in the past. The differences between the traditional variational equation integration approach and the approach that we used are mainly as follows: (1) according to the GRACE data quality, the arc length is no longer a constant in the determination of temporal gravity field models; (2) the kinematic empirical parameters, which are mainly designed to remove the bias and drifts in KBRR

residuals, are abandoned and (3) the method of variation of constants developed at the Astronomical Institute of the University of Bern (AIUB) and used to solve the system of variational equations associated with constrained pulses and piecewise constant accelerations is used to calculate the sensitivity matrices of accelerometer bias parameters to improve the calculation efficiency and ensure the calculation accuracy. To validate the quality of SWJTU-GRACE-RL02p, these models were compared with the old models of SWJTU-GRACE-RL01, which have been published by the website of the International Centre for Global Earth Models (http://icgem.gfzpotsdam.de/series), and the official products [i.e. the RL05 and RL06 versions of GRACE LEVEL2 at the Centre for Space Research (CSR), Jet Propulsion Laboratory (JPL) and GeoForschungsZentrum (GFZ)]. Compared to the RL06 version of official models, the models of SWJTU-GRACE-RL02p present competitive performance for global mass changes. Furthermore, these models show less noise and a higher signal strength over some local areas with large mass changes than the models of SWJTU-GRACE-RL01. The comparisons between SWJTU-GRACE-RL02p and a variety of other models including official models, GLDAS, models provided by EGSIEM and daily solutions released by ITSG indicate that our approach and the data processing details presented in this paper provide an alternative strategy for the recovery of temporal gravity field models from GRACE-type data. © 2021 The Author(s). Published by Oxford University Press on behalf of The Royal Astronomical Society.

### Bihari, S. P., Sadhu, P. K., Sarita, K., Khan, B., Arya, L. D., Saket, R. K., & Kothari, D. P. (2021). A Comprehensive Review of Microgrid Control Mechanism and Impact Assessment for Hybrid Renewable Energy Integration. *IEEE Access*, *9*, 88942–88958. Scopus. https://doi.org/10.1109/ACCESS.2021.3090266

### Abstract

This paper describes a comprehensive review of microgrid control mechanism and impact assessment for hybrid grid. Building the model of sustained energy growth is one of the actions to achieve the Sustainable Development Objective (SDO) and change the global fossil fuel system. For co-operation in the development of one independent supplier of renewable energy, the microgrid is essential. Hybrid solar energy microgrid is also a solution for reducing fossil fuel consumption and providing an environmentally sustainable solution to rising rural electricity demand. The most common renewable energy options in the microgrid are solar photovoltaics, wind turbines and biomass. The environmentally sustainable and technologically innovative installation is convenient everywhere. Hybrid microgrid-based renewable energy, however, is confronted, given its intermittent and variable source efficiency, by challenges such as voltage instability, frequency instability, charge malfunction and power quality problems. The paper thus offers a critical overview of the micro grid growth, economic analysis and control strategy.

# Pal, R., Chavhan, S., Gupta, D., Khanna, A., Padmanaban, S., Khan, B., & Rodrigues, J. J. P. C. (2021). A comprehensive review on IoT-based infrastructure for smart grid applications. *IET Renewable Power Generation*, 15(16), 3761–3776. Scopus. <u>https://doi.org/10.1049/rpg2.12272</u>

### Abstract

Currently, there is a huge production in the automotive industries and energy consumption resulted into spike in the cost and emissions of greenhouse gases. Hence, an efficient energy utilization mechanism has become a prime most important factor. Energy and its conservation problem also have raised and become one of the prominent critical factors needed to address. Therefore, the development of smart grid infrastructure is one of the solutions to address the above issue. This article discusses different methods and mechanisms require to manage energy efficiently within the smart grid network using communication technologies and protocols and proposed an integration method of electric vehicles and smart grid using communication networks for charging or discharging electricity and exchanging relevant information. In addition, this paper discusses different integration strategies and multi-agent system implementation in the smart grid network. The proposed multi-agent system shows the efficient method for monitoring power flow and maintaining the stability of the grid. The paper also presents the optimal scheduling of charging of electric vehicles in the smart grid network. Finally, the authors investigated and presented many standard communication protocols and their comparisons with respect to different scenarios. This paper discuss different methods and concepts which would require to manage energy efficiently by using recent communication technologies, communication protocols, and sensor technologies.

Bhadane, K., Sanjeevikumar, P., Khan, B., Thakre, M., Ahmad, A., Jaware, T., Patil, D. P., & Pande, A. S. (2021). A Comprising Study on Modernization of Electric Vehicle Subsystems, Challenges, Opportunities and strategies for its Further Development. 2021 International Conference on Nascent Technologies in Engineering, ICNET 2021 - Proceedings. Scopus. https://doi.org/10.1109/ICNTE51185.2021.9487757

### Abstract

At present scenario, globally commonly used transportation system are based on IC Engine based vehicles which affects environment due to emission of greenhouse gases. due to the systematic approach for electric transportation system towards green transportation and reducing the crucial issues of global climate changes are the initiative for saving the environment. In recent years the transport industry has become very popular with Electrical Vehicles (EVs). Due to its recent development which will likely to replace the ordinary IC Engine based vehicle in near future to save the nature against the pollution. In this paper, present EV subsystems and its configurations, components of EV are discussed. This paper focus on reviewing the present scenario of EV, latest development of EV and challenges, opportunities for effective deployment of EVs are highlighted. Also there is scope for effective implementation of smart grid technology in EV, grid to vehicle and vehicle to grid, vehicle to home as well as home to vehicle technology along with renewable power incorporation connectivity to EVs and Grid framework and future study developments are also underlined. The paper is intended to include the latest technology and new solutions for future production of electrical vehicles in order to lead to future research into this area.

### Alem, K. D., & Gebru, E. A. (2021). A cross-sectional analysis of refractive error prevalence and associated factors among elementary school children in Hawassa, Ethiopia. *Journal of International Medical Research*, 49(3). Scopus. https://doi.org/10.1177/0300060521998894

### Abstract

**Objective**: This study assessed the prevalence of refractive error (RE) and its associated factors among elementary school children in Hawassa, Ethiopia.

**Methods**: In this school-based cross-sectional study, a random selection technique with proportional allocation was used to ensure a representative sample of students. Survey questionnaires were used to collect sociodemographic, environmental, and family history data.

Clinical examinations were performed to assess RE and ocular health. Associations between dependent and independent variables were computed using adjusted odds ratios (AORs) and 95% confidence intervals (CIs).

**Results**: Overall, 529 children participated in this study, with a response rate of 95.5% (529/554). Most participants were aged  $\geq$ 12 years (337 [63.7%]), in grade levels 5 to 8 (307 [58%]), and attended public schools (366 [69.2%]). RE prevalence was 12.9% (95% CI: 10.0–16.1). Higher grade level (AOR=3.18, 95% CI: 1.68–5.97), positive family history of RE (AOR=3.69, 95% CI: 1.57–8.67), lack of paternal formal education (AOR=3.25, 95% CI: 1.20–8.77), and public school attendance (AOR=3.33, 95% CI: 1.52–7.27) were factors significantly associated with RE. **Conclusions**: RE prevalence among elementary school children in Hawassa was higher than in previous reports. Grade level, family history, paternal education level, and school type significantly influenced RE status.

Sathish, T., Chandramohan, D., Dinesh Kumar, S., Rajkumar, S., & Vijayan, V. (2021). A facile synthesis of Ag/ZnO nanocomposites prepared via novel green mediated route for catalytic activity. *Applied Physics A: Materials Science and Processing*, 127(9). Scopus. https://doi.org/10.1007/s00339-021-04854-6

### Abstract

The present study explores a facile and novel lucrative synthetic strategy to fabricate zinc oxide (ZnO) nanoparticles (NPs) and silver (Ag)/ZnO nanocomposites (NCs) via Withania somnifera root extract. The bending and stretching vibrations for ZnO and Ag/ZnO NCs were probed using Fourier transform infrared spectroscopy. The field emission scanning electron microscopy and transmission electron microscopy analyses were showed that the synthesized nanomaterials were spherical with reduced size and an average dimension of about ~ 20 nm. The crystalline structure of the as-synthesized nanomaterials was characterized using X-ray diffraction studies. Elemental analysis of the fabricated NCs was analyzed using X-ray fluorescence studies. The synthesized ZnO and Ag/ZnO NCs have been examined for their catalytic activity toward anthropogenic pollutants such methyl orange (MO), methyl violet (MV), and malachite green (MG). The results portrayed that the Ag/ZnO NCs showed enhanced catalytic activity than ZnO NPs with degradation efficiency of 95, 88, and 97% in 6 min, 6 min, and 8 min for MO, MV, and MG. The enhanced catalytic property may be due to Ag ions' combined effect on ZnO NPs, which
results in the high electron transfer efficiency between the donor and the acceptor molecule. Hence, the fascinating finding in the current research is that the synthesized nanomaterials act as a potent nanocatalyst to clear up various environmental issues.

# Banteywalu, S. M., Bekele, G., Khan, B., De Smedt, V., & Leroux, P. (2021). A high-reliability redundancy scheme for design of radiation-tolerant half-duty limited dc-dc converters. *Electronics (Switzerland)*, *10*(10). Scopus. https://doi.org/10.3390/electronics10101146

# Abstract

Redundancy techniques are commonly used to design radiation-and fault-tolerant circuits for space applications, to ensure high reliability. However, higher reliability often comes at a cost of increased usage of hardware resources. Triple Modular Redundancy (TMR) ensures full single fault masking, with a >200% power and area overhead cost. TMR/Simplex ensures full single fault masking with a slightly more complicated circuitry, inefficient use of resource and a >200% power and area overhead cost, but with higher reliability than that of TMR. In this work, a high-reliability Spatial and Time Redundancy (TR) hybrid technique, which does not abandon a working module and is applicable for radiation hardening of half-duty limited DC-DC converters, is proposed and applied to the design of a radiation-tolerant digital controller for a Dual-Switch Forward Converter. The technique has the potential of double fault masking with a <2% increase in resource overhead cost compared to TMR. Moreover, for a Simplex module failure rate,  $\lambda$ , of 5%, the Reliability Improvement Factor (RIF) over the Simplex system is 20.8 and 500 for the proposed technique's two-and three-module implementations, respectively, compared to a RIF over the Simplex system of only 7.25 for TMR and 14.3 for the regular TMR/Simplex scheme.

Nane, D., Hatløy, A., & Lindtjørn, B. (2021). A local-ingredients-based supplement is an alternative to corn-soy blends plus for treating moderate acute malnutrition among children aged 6 to 59 months: A randomized controlled non-inferiority trial in Wolaita, Southern Ethiopia. *PLoS ONE*, *16*(10 October). Scopus. https://doi.org/10.1371/journal.pone.0258715

#### Abstract

#### Background

Globally, moderate acute malnutrition (MAM) affects approximately 5% of children below five years of age. MAM is a persistent public health problem in Ethiopia. The current approach in

Ethiopia for managing MAM is a supplementary feeding program; however, this is only provided to chronically food-insecure areas. The objective of the study was to compare a local-ingredients-based supplement (LIBS) with the standard corn-soy blend plus (CSB+) in treating MAM among children aged 6 to 59 months to test the hypothesis that the recovery rate achieved with LIBS will not be more than 7% worse than that achieved with CSB+.

# **Methods and findings**

We used an individual randomized controlled non-inferiority trial design with two arms, involving 324 children with MAM aged 6 to 59 months in Wolaita, Southern Ethiopia. One hundred and sixty-two children were randomly assigned to each of the two arms. In the first arm, 125.2 g of LIBS with 8 ml of refined deodorized and cholesterol-free sunflower oil/day was provided. In the second arm, 150 g of CSB+ with 16 ml of refined deodorized and cholesterol-free sunflower oil/day was provided. Each child was provided with a daily ration of either LIBS or CSB+ for 12 weeks. Both intention-to-treat (ITT) and per-protocol (PP) analyses were done. ITT and PP analyses showed non-inferiority of LIBS compared with CSB+ for recovery rate [ITT risk difference = 4.9% (95% CI: -4.70, 14.50); PP risk difference = 3.7% (95% CI: -5.91, 13.31)]; average weight gain [ITT risk difference = 0.10 g (95% CI: -0.33 g, 0.53 g); PP risk difference = 0.04 g (95% CI: -0.38 g, 0.47 g)]; and recovery time [ITT risk difference = -2.64 days (95% CI: -8.40 days, 3.13 days); PP difference -2.17 days (95% CI: -7.97 days, 3.64 days]. Non-inferiority in MUAC gain and length/height gain was also observed in the LIBS group compared with the CSB+ group.

#### Conclusions

LIBS can be used as an alternative to the standard CSB+ for the treatment of MAM. Thus, the potential of scaling up the use of LIBS should be promoted.

Beyene, H., Hailu, D., Tadele, H., Persson, L. Å., & Berhanu, D. (2021). A mixed-methods study exploring adherence to the referral of severely sick children in primary health care in Southern Ethiopia. *Archives of Public Health*, 79(1). Scopus. https://doi.org/10.1186/s13690-021-00681-6 Abstract

#### Background

We have shown that Ethiopian primary healthcare providers refer only half of the severely sick children who, according to guidelines, should get an urgent referral. Frequently parents of referred ill children don't bring their children to the next level. We aimed to describe the referral of severely

ill Ethiopian children based on primary healthcare register reviews and explore health care providers' and parents' perceptions regarding factors that hinder or enhance referral.

# Methods

A mixed-methods study was conducted in 11 districts and a town administration of the Hadiya zone in Ethiopia's Southern region from May to June 2019. Data collection included interviews and focus group discussions with healthcare providers, key informant interviews with parents of sick children who had been referred, and reviewing registers of sick children treated during the last 12 months at health posts and health centres. We analysed the association between healthcare providers' and sick children's characteristics and providers' compliance with referral guidelines for sick children 0–59 months old. Content analysis was undertaken to explore the perceived factors that influenced referral and adherence to referral from providers' and parents' perspectives.

#### Results

Healthcare providers did not refer nearly half of the severely ill children that should have been referred, according to guidelines. Providers who had received in-service training on child healthcare were more likely to adhere to referral guidelines. The severity of the child's illness and mobile phone communication and transport availability were perceived to be positively associated with adherence to referral guidelines. Lack of knowledge of treatment guidelines and skills, and high health worker workload, were among the factors perceived to be linked to lower adherence to guidelines. The healthcare providers considered parents of referred sick children as having low compliance with the referral advice. In contrast, parents had the opinion that compliance with a referral costs, and availability of transport or ambulance services were perceived to motivate parents to take their children to the referral facility. Traditional illness perceptions, lack of confidence in the referral site's medical care, and a long distance were perceived to hurdle caregivers' referral compliance.

#### Conclusions

We found that the healthcare providers' adherence to referral guidelines was not optimal. Care providers and parents had divergent opinions on parents' compliance with referral advice. Factors related to the health system, family economy, and available ambulance services influence whether care providers and parents pursued severely ill children's referrals.

Gupta, A., Pachar, R. K., Khan, B., Mahela, O. P., & Padmanaban, S. (2021). A multivariable transmission line protection scheme using signal processing techniques. *IET Generation*, *Transmission and Distribution*, *15*(22), 3115–3137. Scopus. https://doi.org/10.1049/gtd2.12244

#### Abstract

This paper introduced an advanced algorithm making hybrid use of Stockwell transform (ST), Hilbert transform (HT) and Alienation coefficient (ACF) for identification, classification and to locate faulty events on transmission line. Signals of Current are processed by application of ST, HT and ACF for computing S-index, H-index and A-index, respectively. These indices are multiplied element by element to compute proposed fault index (FI). A threshold magnitude is decided after testing the algorithm during different fault scenarios and faulty events are recognized when FI exceeds this threshold magnitude. Faults are categorized by identifying the number of phases which are faulty in nature and a ground fault index (GFI). GFI is designed by processing the zero sequence current using ST and used to identify involvement of ground during fault event. A mathematical formulation is framed to estimate location of faults on transmission line. Fault location has been estimated with a mean error less than 1%. Investigated faults include phase to ground (PGF), double phase (PPF), double phase to ground (PPGF) and three phase to ground (TPGF). Algorithm is found effective for faulty scenario such as fault impedance variations, fault incidence angle (FIA) variations, reverse power flow, effect of line loading, effect of noise, transient faults, off-nominal frequency, and presence of harmonic components. Algorithm is also effective for discriminating switching transients from faulty conditions. Effective performance of the algorithm is established by comparing with fault detection and classification approach based on alienation coefficients, discrete Fourier transform (DFT) and time-frequency approach. Study is performed on a two terminal transmission line in MATLAB/Simulink environment. Effectiveness of the algorithm is also established on a real time transmission grid of Rajasthan state of India.

Nigussie, B., Eifa, A., Tagesse, B., & Ketema, W. (2021). A neonatal hip septic arthritis caused by klebsiella pneumonia at hawassa university comprehensive specialized hospital neonatal unit, hawassa, sidama, ethiopia. *International Medical Case Reports Journal*, 14, 471–474. Scopus. https://doi.org/10.2147/IMCRJ.S321935

#### Abstract

#### Background

Neonatal hip septic arthritis is one of the rarest clinical conditions epidemio-logically but with momentous long-term sequelae. Early detection and proper intervention have a paramount role in alleviating the shattering long-term effects. The clinical presentation of neonatal hip septic arthritis is very non-specific, with limited movement of the extremities and excessive crying during manipulations such as diaper changing. Our case was a 17-day-old male newborn who presented to our hospital after a family noticed decreased left leg movement and crying while changing diapers for 5 days, with the associated complaint of holding the left leg in a flexed position. The newborn then underwent all the available investigations and the diagnosis of hip septic arthritis was made. We were stunned by the culture result, which isolated Klebsiella pneumonia from the sample that had been taken from joint fluid, which is a very unusual isolate.

#### Conclusion

Hip septic arthritis is an orthopedic emergency, especially in neonates. It should be considered in newborns presenting with pseudoparalysis as the presentation is non-specific. Considering a less common microorganism with culture and sensitivity is very important, especially if the response to treatment is delayed. We endorse proper workup and timely intervention as hip arthritis has a poor prognosis when the management is delayed.

Gangwar, A. K., Mahela, O. P., Rathore, B., Khan, B., Alhelou, H. H., & Siano, P. (2021). A Novel k-Means Clustering and Weighted k-NN-Regression-Based Fast Transmission Line Protection. *IEEE Transactions on Industrial Informatics*, 17(9), 6034–6043. Scopus. https://doi.org/10.1109/TII.2020.3037869

### Abstract

This article presents a k-means clustering and weighted k-nearest neighbor (k-NN) regressionbased algorithm for the protection of transmission line. Three-phase current signals of both the terminals are synchronized and sampled with a sampling frequency of 3.84 kHz. Cumulative differential sum (CDS) is computed by subtracting the samples of current cycle from the previous cycle at both the terminals of transmission line. k-means clustering is applied on CDS to compute two centroids using moving window of width, equal to one cycle. Difference between the absolute values of centroids is computed at both the terminals and represented by the centroid difference (CD). The CD of both the terminals is added to compute the fault index. The computed fault index is used to detect and classify the types of faults. The location of the fault is estimated by the weighted k-NN regression method. Various case studies are performed to validate the robustness of the algorithm for different fault parameters such as fault impedance and fault location.

Mahela, O. P., Bhati, V. S., Ahmad, G., Khan, B., Sanjeevikumar, P., Garg, A. R., & Mahla,R. (2021). A protection scheme for distribution utility grid with wind energy penetration.ComputersandElectricalEngineering,94.Scopus.https://doi.org/10.1016/j.compeleceng.2021.107324

# Abstract

The impact of fault circumstances on distribution grid parameters in the presence of wind power generation is explored in this research. A protection algorithm (PA) is also proposed for detecting faulty events by using the proposed wind fault index, which is computed by analysing current signals using the Wigner distribution function and the Stockwell transform (ST). The sort of fault is determined by the number of faulty phases found. The zero sequence currents introduced to identify the ground's involvement in a fault event are analysed to calculate a wind ground fault index. Single phase to the ground, double phase to the ground, double phase, three-phases, and three phases to the ground faults are all investigated fault events. It has been determined that PA outperforms discrete Wavelet Transform and ST-based approaches in terms of fault estimation time and noise effect. The study was conducted on the IEEE-13 bus test feeder, which was connected to wind power plants (WPPs).

Budge, S., Hutchings, P., Parker, A., Tyrrel, S., Norton, S., Garbutt, C., Woldemedhin, F., Jemal, M. Y., Moges, M., Hussen, S., & Beyene, H. (2021). A randomised controlled feasibility trial of a babywash household playspace: The campi study. PLoS Neglected Tropical Diseases, 15(7). Scopus. https://doi.org/10.1371/journal.pntd.0009514

### Abstract

#### Background

Water, sanitation and hygiene (WASH) interventions should support infant growth but trial results are inconsistent. Frequently, interventions do not consider behaviours or transmission pathways specific to age. A household playspace (HPS) is one intervention component which may block faecal-oral transmission. This study was a two-armed, parallel-group, randomised, controlled feasibility trial of a HPS in rural Ethiopia. It aimed to recommend proceeding to a definitive trial. Secondary outcomes included effects on infant health, injury prevention and women's time.

#### Methods

November 2019–January 2020 106 households were identified and assessed for eligibility. Recruited households (N = 100) were randomised (blinded prior to the trial start) to intervention or control (both n = 50). Outcomes included recruitment, attrition, adherence, and acceptability. Data were collected at baseline, two and four weeks.

### Findings

Recruitment met a priori criteria ( $\geq$ 80%). There was no loss to follow-up, and no non-use, meeting adherence criteria (both  $\geq$ 10%). Further, 48.0% (95% CI 33.7–62.6; n = 24) of households appropriately used and 56.0% (41.3–70.0; n = 28) cleaned the HPS over four weeks, partly meeting adherence criteria ( $\geq$ 50%). For acceptability, 41.0% (31.3–51.3; n = 41) of infants were in the HPS during random visits, failing criteria ( $\geq$ 50%). Further, the proportion of HPS use decreased during some activities, failing criteria (no decrease in use). A modified Barrier Analysis described good acceptability and multiple secondary benefits, including on women's time burden and infant injury prevention.

#### Interpretation

Despite failing some a priori criteria, the trial demonstrated mixed adherence and good acceptability among intervention households. A definitive trial to determine efficacy is warranted if recommended adjustments are made.

Zeleke, M. A., & Ageze, M. B. (2021). A Review of Peridynamics (PD) Theory of Diffusion Based Problems. *Journal of Engineering (United Kingdom)*, 2021. Scopus. https://doi.org/10.1155/2021/7782326

#### Abstract

The study of heat conduction phenomena using peridynamic (PD) theory has a paramount significance on the development of computational heat transfer. This is because PD theory has got an interesting feature to deal with the inherent nonlocal nature of heat transfer processes. Since the revolutionary work on PD theory by Silling (2000), extensive investigations have been devoted to PD theory. This paper provides a survey on the recent developments of PD theory mainly focusing on diffusion based peridynamic (PD) formulation. Both the bond-based and state-based PD formulations are revisited, and numerical examples of two-dimensional problems are presented.

# Gelaye, G., Sandip, B., & Mestawet, T. (2021). A REVIEW ON SOME FACTORS AFFECTING WOOL QUALITY PARAMETERS OF SHEEP. African Journal of Food, Agriculture, Nutrition and Development, 21(105), 18980–18999. Scopus. https://doi.org/10.18697/AJFAND.105.19330

#### Abstract

Wool is a natural fibre with a unique amalgamation of properties that are exploited in garment industry. The wool industry, in particular the production of fine wool, has a notable role in world trade and the price of the wool is dependent on quality. Accordingly, wool characteristics have direct impact on wool prices set by processors and industry. These properties can particularly benefit the wearer of the garment during exercise. There are different factors affecting wool quality parameters both with direct and indirect involvement. The environmental and genetics are the main factors affecting quality and quantity of wool from sheep. Infections related to skin and parasitic infestations have direct influence on the quality of wool. Breed or genotype is one of the main genetic factors that influences the product and productivity as well as quality of wool from sheep that is fleece from different sheep breeds is different in its both physical and chemical characteristics. Hormonal changes in relation to sex of sheep also have effect on the wool quality traits. The main objective of this review was to define and explore key wool characteristics, such as staple length, number of crimp, fibre type, fibre diameter, wool wax and scouring yield in regards to quality and interventions approaches for improving. In most of studies, non-genetic factors such as age, season, shearing period, shearing frequency and nutrition have a significant effect on traits viz. staple length, wool wax, scouring yield, fibre diameter and for other traits as well. Conducting a research on wool quality characteristics is an operative way of defining and differentiating the quality of wool. Acquiring knowledge of the wool quality characteristics can help to manage the end use products, consumers comfort and processing intensity. Therefore, an understanding of the factors affecting physical and chemical properties of wool traits is important to improve the quality of wool through genetics and management interventions.

# Kassa, Z. Y., & Hadra, N. (2021). A systematic review and meta-analysis on women's knowledge of preconception care. *Ethiopian Journal of Reproductive Health*, 13(2), 1–8. Scopus.

#### Abstract

#### Background

Preconception care includes any intervention to optimise a woman's health before pregnancy to improve maternal, newborn, and child health outcomes. It is vital for identifying risky behaviours before pregnancy and reducing the number of unintended pregnancies. This metaanalysis aimed to determine the pooled prevalence of women's knowledge across the world.

# Method

Published and unpublished research reports on women's knowledge of preconception care were used. The databases used are PubMed, Medline, and Google Scholar. Unpublished articles were searched from different repository electronic libraries and through Google. Two independent authors (ZY and NH) searched articles by using the following key terms, "knowledge" OR "awareness", "woman/women\*" AND "preconception care", "preconception care" OR "preconception health care", "preconception care" AND "worldwide". The critical appraisal was done using the Joana Brigg's Institute (JBI) checklist for prevalence study, which has nine scores.

#### Results

Four hundred twenty-eight published and unpublished articles were retrieved from different databases: PubMed, Medline, Google Scholar, Google, and Cochrane Library. Unpublished

articles were searched from different repositories, electronic libraries, and Google. The pooled prevalence of women's preconception care knowledge was 35.3% (95% CI: 24.5-47.8%).

# Conclusion

This study showed that women's knowledge of preconception care is low. This finding suggests that governmental and non-governmental organisations should pay attention to creating awareness and implementation to enhance preconception care.

# Regasa, D. G., Diro, B. A., Tadesse, E. D., & Buta, M. N. (2021). Access to financial services and innovation: Firm-level data for Ethiopia. *Innovation and Development*, 11(1), 119–134. Scopus. https://doi.org/10.1080/2157930X.2020.1798070

#### Abstract

Using World Bank's Ethiopian Enterprise Survey round of 2011 and 2015 data from Ethiopian manufacturing and service firms, this paper identifies the effect of financial services on the innovation strategies of firms. We find a strong positive correlation between firm's access to external finance and its innovative activities. Our preferred specification, the instrumental variable estimator, suggests that a 1% rise in external financing source in the firm's total fund increases the propensity to innovate the firm's operation by about 2%. In a similar spirit, credit-constrained firms have about 24% lower incidence of innovation compared to credit unconstrained firms. We find that the results are substantially robust across alternative econometric specification. The results also remain consistent for the individual components of innovation index such as product, process, organizational, marketing and R&D innovation activities.

Tesfaye, T., Woldesemayat, E. M., Chea, N., & Wachamo, D. (2021). Accessing healthcare services for people with physical disabilities in Hawassa city administration, Ethiopia: A cross-sectional study. *Risk Management and Healthcare Policy*, *14*, 3993–4002. Scopus. https://doi.org/10.2147/RMHP.S317849

#### Abstract

### Background

Persons with disabilities experience significant barriers to accessing health care. These barriers may be more serious in countries such as Ethiopia. In this study, we aimed to assess the prevalence

of accessibility and associated factors among physically disabled people visiting physical disability associations in Hawassa.

# Methods

A cross-sectional study was conducted among 345 randomly selected physically disabled people who visited disability associations in Hawassa. Data were collected from February 1 to 28, 2020 through face-to-face interview using a semi-structured questionnaire. Data analysis was done by SPSS version 23. Statistically significant test was declared using statistical cut-off point of P-value < 0.05.

#### Results

Accessibility to healthcare services among respondents was 83 (25.4%). About three-quarters of these respondents (74.6%) experienced at least one access barrier to healthcare services; 61.5% experienced physical barriers, 62.7% reported barriers related to medical equipment and 59.3% had communication barriers. Male participants (AOR = 3.19, 95% CI: 1.70, 6.99), married individuals (AOR = 2.95, 95% CI: 1.59, 5.49), people whose costs for healthcare services was covered by NGOs (AOR = 3.23, 95% CI: 1.39, 7.51) and participants with no experience of discrimination when accessing healthcare services (AOR = 5.84, 95% CI: 3, 11, 10.95) had more access to healthcare services.

### Conclusion

Accessibility to healthcare services among people with disabilities was poor in the study. It is related with various factors. Therefore, it is important to strengthen inter-sectoral collaboration, promote community health insurance and strengthen the economic capacity of persons with physical disabilities in order to overcome barriers.

Bekala, D., Reda, D. Y., & Ali, M. M. (2021). Acid-fast bacilli positivity rate and associated factors among leprosy suspected cases attending selected health facilities located in West Arsi Zone, Oromia, Ethiopia. *Infection and Drug Resistance*, *14*, 4581–4589. Scopus. https://doi.org/10.2147/IDR.S339102

### Abstract

# Introduction

Leprosy is one of the neglected tropical diseases that affect skin and peripheral nervous system often results in severe, lifelong disabilities and deformities. Even though multi-drug therapy was

in place for more than 30 years to treat and prevent leprosy worldwide including Ethiopia, its epidemiology is not well studied in the West Arsi zone.

# Objective

The aim of this study was to determine the prevalence of acid-fast bacilli (AFB) positivity rate and associated factors among leprosy suspected cases. Methods: A health facility-based cross-sectional study was conducted among 422 leprosy suspected cases from August 2020 to December 2020. To detect AFB, skin slit specimens were collected and examined using the Ziehl-Neelsen staining technique. Socio-demographic and clinical data were collected using a structured questionnaire. Data were analyzed using Statistical Package for Social Sciences (SPSS) version 24. Logistic regression was employed to determine predictors of AFB positivity rate. **Results** 

Acid-fast bacilli were detected among 46 leprosy suspected cases which gives a prevalence of 10.9% with 95% CI (8.2–15.6). Suspected leprosy cases with multibacillary type were 4 times more likely to be AFB positive (p=0.021) than their counterparts. Study participants who had contact with known leprosy cases were 2 times more likely to be AFB positive (p = 0.032) and those with no formal education were 2 times more likely to be AFB positive (p = 0.03). Participants who had close contact with leprosy patients for  $\geq$ 3 years were 8 times more likely to be AFB positive (p = 0.02).

### Conclusion

This study revealed a high prevalence of AFB positivity rate in the era of multidrug therapy. Types of leprosy, close contact with known leprosy cases, educational status, and duration of closer contact with leprosy cases were significantly associated with AFB positivity rate.

Deyno, S., Tola, M. A., Bazira, J., Makonnen, E., & Alele, P. E. (2021). Acute and repeateddose toxicity of Echinops kebericho Mesfin essential oil. *Toxicology Reports*, *8*, 131–138. Scopus. https://doi.org/10.1016/j.toxrep.2020.12.027

#### Abstract

Echinops kebericho Mesfin is used for the management of various diseases and fumigation during child birth. This study investigated acute and repeated-dose toxicity of E. kebericho M. essential oils (EOs). The study was conducted in Swiss albino mice. Organ weight, histopathology and clinical chemistry were analyzed. The dose and duration of treatment were defined in accordance

with Organization for Economic Co-operation and Development (OECD) guideline. No mortality was observed in acute oral dose toxicity study up to 2000 mg/kg per body weight. Compared to control group, treated groups did not show significant abnormalities in body weight and most parameters of clinical chemistry parameters and relative organ weight in repeated-dose toxicity study. However, urea, albumin, aspartate aminotransferase, and relative organ weight of right kidney showed variations in treated groups compared to control group. All treated groups and control group showed normal histology except lymphocytic infiltrates observed on the kidney with 200 mg/kg treated female group. The current study revealed that EO of E. kebericho M. could be considered well tolerated in acute and repeated-dose exposure.

# Rike, M., Loha, E., & Kassa, A. (2021). Adherence to Antiretroviral Treatment among Adult People Living with HIV/AIDS Attending Highly Active Antiretroviral Therapy at Adare Hospital, Southern Ethiopia. *Ethiopian Journal of Health Development*, 35(2), 1–11. Scopus.

#### Abstract

#### Background

Adherence to antiretroviral therapy (ART) has paramount advantages for programmatic success, including its good treatment outcomes and reduced risk of resistant viral strains transmission to the general population. There is limited evidence on the magnitude and associated factors of adherence to ART among adult PLWHA attending highly active ART (HAART) at Adare General Hospital, Southern Ethiopia.

#### Objective

This study aimed to determine the magnitude and associated factors of adherence to ART among adult PLWHA attending (HAART) at Adare General Hospital, Southern Ethiopia. Methods: A hospital-based cross-sectional study was conducted from January 01/2018 to February 30/2018 at Adare Hospital. The participants were 370 adult people living with HIV/AIDS taking ART and who were selected by systematic random sampling technique. The data were collected by trained health professionals using a pre-tested interviewer-administered structured questionnaire. The data collected was entered into a computer and analysed using SPSS version 19. Descriptive statistics and multiple logistic regressions were applied. The significance level of association was considered at p-value <0.05.

# Results

The magnitude of retrospectively self-reported combined adherence (measured by dose, schedule and dietary instructions) to ART in the past seven days before the interview was 80.3%. In multivariate analysis, Sidaamu Afoo language (AOR=0.5, 95%CI: 0.21-0.99), monthly income <1,000 Ethiopian Birr (AOR=0.08; 95%CI: 0.030.26), not disclosing HIV status to others (AOR=0.18; 95%CI: 0.07-0.50), taking ART pills comfortably while others looking (AOR=6.0; 95%CI: 2.54-13.91) and no utilisation of reminders (AOR=0.08; 95%CI: 0.03-0.21) were factors significantly associated with combined adherence. Forgetfulness and not wanting to take ART while others are looking were major reasons to miss pills.

# Conclusion

Adherence to ART among adult PLWHA attending HAART at Adare Hospital was suboptimal, but still comparable with that of resource-limited settings. To maximise treatment success, considering emphasised translation to Sidaamu Afoo language, encouraging patients to be involved in any income-generating system and to reveal their HIV status for others.

# Urgessa Waktola, T., & Fekadu, K. (2021). Adoption of Coffee Shade Agroforestry Technology and Shade Tree Management in Gobu Seyo District, East Wollega, Oromia. *Advances in Agriculture*, 2021. Scopus. <u>https://doi.org/10.1155/2021/8574214</u>

# Abstract

Coffee production in the form of agroforestry practices is the most important management approach to improve the livelihoods of the farming community. This study was conducted to assess factors affecting the adoption of the technology, its socioeconomic and environmental benefits, and the management practices related to the technology. Out of eight kebeles in the district, two kebeles were selected purposively based on the existing and extensive agroforestry practices. Four villages were selected randomly. Based on the preidentified criteria as coffee growers and nongrowers, coffee growers were selected purposively. Then a total of 120 households were selected by Simple Random Sampling Method. Data were collected by using structured interview and field observation. The data were analyzed by using descriptive statistics analysis. The logit model was used to identify the factors affecting the adoption of coffee shade agroforestry technology had a positive relationship and was statistically significant at 1% level with age and area covered

by coffee production, while household composition and training were at 5% level. Education level, land holding, and extension services also had positive relationship, but it was not statistically significant. The farmers in the study area mentioned other benefits of these technologies such as for animal feed, firewood and construction materials, medicinal purpose, erosion control, honey bee production, and soil fertility enhancement. Different management activities were also identified in the area (such as composting, pruning, watering, and weeding). Coffee shade agroforestry technology was important to diversify the agricultural products, to solve the problem of livelihood, and adds economic and environmental benefits.

# T, K. (2021). Adoption Of Garden Coffee Production Technology Package By Smallholder Farmers In Ethiopia. African Journal of Food, Agriculture, Nutrition and Development, 21(5), 17989–18004. Scopus. https://doi.org/10.18697/ajfand.100.19990

# Abstract

This study investigated the level and determinants of garden coffee production technology package adoption in Ethiopia. The analysis was based on survey data collected from 293 garden coffeegrowing households. The findings show that garden coffee production technology package adoption status in Dale districts was various across the smallholders' growers. The productivity of improved coffee varieties at farm plots was less than at research plots in Dale due to low coffee production technology package adoption. The use of improved coffee varieties, weed control practices, compost application, pruning practices, shade tree management, intercropping practices, and coffee seedling planting spacing is the main garden coffee production technology package practiced by smallholder coffee growers in Dale. Thus, the garden coffee production technology package adoption index score ranged from 0.43 to 1.00. Adoption index scores were categorized into high (0.71 to 1), medium (0.5 to 0.7) and Low (0.43 to 0.49) adopters. Only 57% of farmers reached high coffee production technology adoption status but the remaining 30% and 13% of garden coffee farmers attained medium and low adoption status. The mean adoption index score was found to be 0.66, which implies the overall adoption status was found under the medium technology adoption category. The maximum likelihood estimates of Tobit model result shows that gender of household head (-0.261), education level (0.09), the annual income of the household (0.003), farm size (0.031), availability of labor (0.155), credit facilities (0.087), coffee extension services (0.047) and farmer perception of improved coffee varieties (-0.024) were significant

determinants of garden coffee production technology package in Dale district. Hence, for farmers to adopt new technology they must know it well. Adopting all components of the coffee production technology package simultaneously as recommended by the research center enhances coffee productivity at farm plots level. Moreover, building better coffee production extension services, institutional arrangement, and access to new technology information can possibly increase coffee production technology package adoption in Ethiopia.

# Mulatu, A., Marisennayya, S., & Bojago, E. (2021). Adoption of Modern Hive Beekeeping Technology: The Case of Kacha-Birra Woreda, Kembata Tembaro Zone, Southern Ethiopia. *Advances in Agriculture*, 2021. Scopus. https://doi.org/10.1155/2021/4714020

#### Abstract

Beekeeping is one of the livelihood options available to Ethiopian farmers. The objectives of this study were to analyze the level of adoption of modern hive technology by farmers and to identify the variables influencing the adoption of modern beekeeping hive technology in Kacha-Birra Woreda. Primary data were collected from 89 respondents chosen using a multistage sampling process, while qualitative data were collected through focus group discussion and key informant interviews. Data were analyzed using a binary logit regression model and descriptive statistics. According to the results of the model, several factors, such as the educational level of the respondents, the size of the land, the extension, the contact, and the access to financing and market, had a substantial impact on the adoption of modern hive beekeeping technology. It is suggested that the Livestock and Fish Resource Development office develops a strategy to help the community's illiterate members benefit more from the use of contemporary hive beekeeping technologies, develops a strategy to benefit farmers who have large land sizes with modern hive beekeeping technology, establishes extension contact with farmers before technology innovation leads to better adoption of technology, and strongly advises to link a strategy with microenterprises. Promotional activities focused on preventing the access to the market of respondents that must ensure their active participation in adoption.

Kara, H. T., Anshebo, S. T., & Sabir, F. K. (2021). Adsorptive Removal of Cd(II) Ions from Wastewater Using Maleic Anhydride Nanocellulose. *Journal of Nanotechnology*, 2021. Scopus. https://doi.org/10.1155/2021/9966811

#### Abstract

In this study, both pristine cellulose nanocrystalline (CNC) and maleic anhydride functionalized cellulose nanocrystalline (MA-CNC) were prepared from the stems of Eichhornia crassipes weed by the sulfuric acid hydrolysis method. The as-prepared adsorbents were characterized by using X-ray diffraction (XRD), Fourier-transform infrared (FTIR) spectroscopy, scanning electron microscopy (SEM), energy-dispersive X-ray (EDX), and Brunauer-Emmett-Teller (BET) instruments. These materials were applied for the removal of Cd(II) ions from WW. The uptake mechanism was fixed to both Langmuir and Freundlich adsorption isotherms with a maximum Cd(II) ion uptake capability (qmax) of 75.76 and 215.52 mg g-1 by CNC and MA-CNC adsorbents, respectively. Pseudo-second-order (PSO) kinetic model was well fitted to the uptake process. The adsorbent regeneration study was done after desorption of Cd(II) ions from the adsorbent by HCl washing. Results exhibited that the adsorbent was reused for the removal of Cd(II) ions from real WW after successive 13th cycle.

# Wang, Z., Zhang, B., Mobtahej, M., Baziar, A., & Khan, B. (2021). Advanced Reactive Power Compensation of Wind Power Plant Using PMU Data. *IEEE Access*, *9*, 67006–67014. Scopus. https://doi.org/10.1109/ACCESS.2021.3075966

# Abstract

This paper introduces a new model to improve the wind power plant performance by modeling its reactive power demand. It develops a probabilistic model based on prediction interval to help better modeling of the reactive power demands of wind unit which needs to be compensated by the static VAr compensator (SVC). This is made possible by the use of a non-parametric neural network (NN) based model using the lower and upper bound estimation (LUBE) method. To avoid the instability arising due to the nonlinear and complex nature of NN, the idea of combined prediction intervals is used here. Due to the highly nonlinear and non-stationary characteristics of the reactive power pattern consumed in the wind power plant, a new optimization algorithm based on theta - symbiotic organisms search (theta -SOS) is proposed to train the LUBE model parameters in the polar coordinates. In addition, a two-phase modification method is developed to enhance the local

search ability of SOS and avoid premature convergence issue. The performance of the proposed model on the experimental Phasor Measurement Unit (PMU) data of a wind unit shows that the model can help to improve the performance of the wind SVC, effectively.

Dibabi, M. M., Debiso, A. T., & Rodamo, K. M. (2021). Adverse maternal outcomes associated with Cesarean deliveries and their determinants: Hospital based cross sectional, mixed- methods study. *Journal of Health Research*. Scopus. https://doi.org/10.1108/JHR-09-2020-0396

#### Abstract

### Purpose

The purpose of this study was to examine adverse outcomes associated with cesarean deliveries and to assess potential confounding factors.

#### Design/methodology/approach

A hospital-based cross-sectional study was conducted from September 1-30, 2019 using mixed methods of data collection. Multistage sampling was used to draw the eligible study participants. The sample size was calculated using the single population proportion formula. A systematic random sampling technique was used to draw the sample size. 180 original medical records were excluded because of having missed information, leaving 1,618 women as the study population. We used the questionnaire adapted from the Ethiopian Demographic and Health Survey to collect quantitative data and analyzed using SPSS version 22, while thematic analysis for qualitative measures was used to generate themes regarding associated perspectives of participants from a community.

# Findings

More than 383 women delivered by cesarean section. 20% of the mothers with the mean age at birth of  $26.1 \pm 4.8$  experienced adverse outcomes. Adjusted odds ratio (AOR) was used to measure the association of determinants and was 2.95 (95% CI 1.19–7.29) for nonuse of antenatal care, 3.18 (95% CI 1.43–6.94) for nonuse of prophylaxis, 4.28 (95% CI 1.58-11.61) for history of medical illness and 7.09 (95% CI 1.19-45.59) for use of substandard operation set up compared with their counterparts.

#### **Research limitations/implications**

Strengths of the study include the finding of the study are reliably reported in mixed study methods examining hospital-based institutional and personal risk factors and exploring the whole

community & apos;s perspectives. However, the important limitations of the study indicate that the study poses a number of challenges related to studying design, therefore there was not sufficient evidence of causality to draw conclusions from the findings. In addition, the study was conducted at a single hospital so that it is not convenient to generalize the findings of the study for setting different in social and economic status.

# **Originality/value**

Based on the findings, attention has been drawn to healthcare personnel to provide training and consultation services for pregnant women and for health care administration to ensure standard set up for operation.

# Tafesse, D., Nallamothu, R. B., Nallamothu, A. K., Nallamothu, S. K., Gezu, L., & Eromo, B. (2021). *Aerodynamic Analysis of Body of Passenger Bus for CO2 Reduction and Fuel Saving* (p. 119). Scopus. <u>https://doi.org/10.1007/978-981-16-0976-3\_11</u>

#### Abstract

In modern society, the automotive manufacturers more concerned about how to improve the fuel economy of the vehicle for saving energy and reduce the emissions from the vehicles to protect the environment. Aerodynamic drag, which is a wind resistance force acting on the body of vehicle against the forward motion of vehicle causing higher fuel usage. The aerodynamic drag has a direct link to fuel consumption of the vehicle. This work was done with the main aim of improving the aerodynamic outer body shape of ISUZU bus, a famous bus, being manufactured and famously used in Ethiopia. CFD analysis was done on the selected bus model for estimation of the drag force. The results obtained with CFD analysis done on modified bus outer body shape were compared with the aerodynamic drag acting on the existing shape of the vehicle. The fuel consumption and the related CO2 emissions were also estimated. Bus body models with modifications were prepared using CATIA and CFD analysis was done with Pheonix software. The selected speed range for analysis was from 80 to 120 kmph. From this work, it is observed that there is a great scope of reducing drag, fuel consumption and related CO2 emissions by modifying the shape of Isuzu bus. When compared to model 1, model 2, at a speed of 120 kmph registered great benefits, with saving of the fuel 5.17 L/h and 52.1 tons of CO2 emission reduction per year. The CFD results show that varying the pressure and velocity over rear and front side of vehicle got a great influence on the total drag acting on the vehicle.

# Eshete, M., Gebremedhin, S., Alemayehu, F. R., Taye, M., Boshe, B., & Stoecker, B. J. (2021). Aflatoxin contamination of human breast milk and complementary foods in southern Ethiopia. *Maternal and Child Nutrition*, *17*(1). Scopus. https://doi.org/10.1111/mcn.13081

#### Abstract

Exposure to unsafe level of aflatoxin in early life may lead to growth faltering. However, the extent of contamination of breast milk and complementary foods is poorly examined. We determined aflatoxin M1 (AFM1) and B1 (AFB1) contamination of human breast milk and cereal-based cooked complementary foods, respectively, among households having children 6–23 months of age in Sidama zone, southern Ethiopia. Data were collected through two cross-sectional surveys implemented in the wet (n = 180) and dry (n = 180) seasons. Eligible households (n = 360) were recruited from three agroecological zones (lowland, midland and highland, each with sample size of 120) using a multistage sampling technique. AFB1 and AFM1 levels were determined using enzyme-linked immunosorbent assay. Mann–Whitney U and Kruskal–Wallis tests were performed to compare aflatoxin levels between seasons and across the agroecological zones. Among 360 breast milk samples tested, 64.4% had detectable AFM1 and 5.3% exceeded the 0.025 parts per billion (ppb) limit set by the European Union for infant milk. The median AFM1 in the lowlands was significantly higher than in the other agroecological settings (P < 0.001). By season, AFM1 was higher in breast milk samples collected in the dry season (P = 0.041). AFB1 was detected in 96.4% of the food samples tested, and 95.0% had concentration exceeding the permissible European Union limit of 0.1 ppb. The median AFB1 was significantly higher in the lowland (P = (0.002), but there was no difference between the seasons (P = 0.386). The study indicated that, in southern Ethiopia, foods intended for infants are heavily contaminated with AFB1. Contamination of breast milk is also a significant health concern.

Worku, W., Temeche, D., Gossa, R., & Abate, B. (2021). Agronomic management options to enhance adoption of maize-common bean-common bean sequential intercropping in southern Ethiopia. *Journal of Crop Science and Biotechnology*, 24(3), 307–318. Scopus. <u>https://doi.org/10.1007/s12892-020-00078-x</u>

#### Abstract

Achieving food security is a prime strategic goal for many developing countries where subsistence smallholder farming is dominant. It is crucial to study and improve existing cropping systems and develop novel ones for enhanced production and efficient resource use. Experiment was conducted to identify compatible density and spatial arrangement for first associated common bean (Phaseolus vulgaris L.) under maize (Zea mays L.)-common bean-common bean sequential intercropping. Factorial combination of four bean densities and three bean arrangements was tested in randomized complete block design. Greater maize yields were obtained from 25 and 50% bean densities and from single-row and within-row arrangements. Single-row arrangement at any bean density and low to moderate densities at any arrangement maintained maize performance. Density by arrangement interaction indicated that increasing bean density enhanced competitive ability and productivity of bean under double-row and within-row arrangements. Greater maize partial land equivalent ratio (LER) of 0.90 and 0.92 were obtained at lower densities of 25 and 50%, respectively, and at single-row arrangement (0.93). Interaction of density with arrangement on total LER showed that moderate densities either in single- or double-row arrangement gave higher intercrop advantages up to a maximum of 59%. Mean net benefit from intercropping exceeded those from sole maize by 30% and from bean-bean double sole crop by 16%. Net benefit among intercrops did not vary significantly and this would allow farmers to make choice depending on their crop priority and their resources such as farm size, labor and crop management techniques.

# Ewunie, G. A., Morken, J., & Yigezu, Z. D. (2021). Alkaline and co-digestion pretreatments: Process optimization for enhancing the methane yield of Jatropha press cake. *Biomass Conversion and Biorefinery*, 11(3), 971–988. Scopus. https://doi.org/10.1007/s13399-020-00732-y

#### Abstract

Oil extraction and biodiesel production process produce a massive amount of by-products like Jatropha press cake (JPC) and crude glycerol (CG), which could be used as a potential substrate for methane production. However, the higher lignocellulosic and nitrogen content in the JPC act

as a recalcitrant and inhibitor, respectivly, for microbes that are involved in the anaerobic digestion (AD) process. Therefore, the present study aimed to enhance the methane yield of JPC by optimizing the alkaline pretreatment and co-digestion process conditions. The effects of NaOH concentration, incubation temperature, and retention time on methane and soluble chemical oxygen demand (sCOD) yields were evaluated and modeled by employing a response surface methodology coupled with central composite design (RSM-CCD). Moreover, a series of batch experiments with various feedstock concentrations (FCs) were tested to investigate the methane yield of JPC when co-digested with CG at different levels. The methane yields of all pretreated samples were significantly higher when compared with these of the untreated JPC. Pretreating the JPC using 7.32% NaOH at 35.86 °C for 54.05 h was the optimum conditions for maximum methane increment of 40.23% (353.90 mL g–1 VS), while co-digesting 2% CG with JPC at 2 g VS L–1 FC enhanced the methane yield by 28.9% (325.47 mL g–1 VS). Thus, the methane yield of JPC was effectively increased by alkaline pretreatment and co-digesting with CG. However, the alkaline pretreatment was relatively more effective compared with the co-digestion process.

# Getnet, D., & Negash, M. (2021). Allometric equations for estimating aboveground biomass of khat (Catha edulis)-stimulate grown in agroforestry of Raya Valley, Northern Ethiopia. *Heliyon*, 7(1). Scopus. <u>https://doi.org/10.1016/j.heliyon.2020.e05839</u>

# Abstract

Khat plant (Catha edulis Forsk) is an evergreen perennial cash crop cultivated in east Africa, southwest Arabia, and Madagascar. The plant is known for its production of stimulant fresh leaves, and expanding as expense of other land uses for its short-term financial returns. We, therefore, developed allometric equations for estimating aboveground biomass and carbon (C) removal of khat grown in farmlands of Raya Valley, Northern Ethiopia. A total of 31 plant individuals were harvested destructively on the basis of their diameters and age ranges. The equations were parametrized using biometric variables such as basal diameter (d10), diameter at breast height (d), dominate height (doh) and mean height (h). Results of the analysis showed that, stem accounted for 58%, branch 32% and foliage 10% of the aboveground biomass (AGB). Commercial foliage biomass C removal ranged from 2.3 to 2.7 Mg ha–1. The power equation, AGB =  $b1 \times d10b2 \times dohb3$ , was the best (highest ranked using goodness-of-fit statistics), explaining 96% of the variation in aboveground biomass (p < 0.01). Models comparisons showed that our best

ranked equation (M6) improved the aboveground biomass estimate by 44% and 48% that of generic and other species-site specific equations developed in the tropics, respectively. Thus, our best species-site specific equation developed in this study can accurately estimate aboveground of khat plant biomass in the study region

Mahela, O. P., Sharma, J., Kumar, B., Khan, B., & Alhelou, H. H. (2021). An algorithm for the protection of distribution feeders using the Stockwell and Hilbert transforms supported features. *CSEE Journal of Power and Energy Systems*, 7(6), 1278–1288. Scopus. https://doi.org/10.17775/CSEEJPES.2020.00170

#### Abstract

Faults' recognition in the distribution feeders (DFs) is extremely important for improving the reliability of the distribution system. Therefore, this paper proposes a technique to identify the faults on the DF using the Stockwell Transform (ST) dependent variance feature and Hilbert transform (HT) by utilizing current signals. By element to element multiplication of the H-index, we compute using HT aided decompositions of current waveforms and VS-index, and calculate through ST aided decomposition of current waveforms. By utilizing the decision rules, various faults are classified. Different faults studied in this work are line to ground, double line, double line to ground and 3- $\Phi$  to ground. For high fault impedance, this technique is effectively utilized. Furthermore, variations in the fault incidence angles are also utilized to test the performance of the proposed technique. To perform the proposed algorithm, a IEEE-13 bus system is developed in MATLAB/Simulink software. The algorithm effectively classified the faults with accuracy greater than 98%. The algorithm is also successfully validated on the IEEE-34 bus test system. Furthermore, the algorithm was successfully validated on the practical power system network. It is recognized that the developed method performed better than the discrete Wavelet transform (DWT) and ruled decision tree based protection scheme reported in various literature. Zeinoddini-Meymand, H., Kamel, S., & Khan, B. (2021). An Efficient Approach with Application of Linear and Nonlinear Models for Evaluation of Power Transformer Health Index. *IEEE* Access, 9, 150172–150186. Scopus. https://doi.org/10.1109/ACCESS.2021.3124845

#### Abstract

In this paper, efficient and accurate linear and nonlinear models are proposed for indicating comprehensive health requirements of the transformer using health index (HI) concept. The models are established with 336 experimental datasets including oil characteristics and dissolved gas analysis (DGA) of various types of transformers placed in different areas. The significance of DGA parameters in transformer health condition is considered with the inclusive DGA factor (DGAF) parameter, which considers the weighting importance of seven dissolved gases. Nonlinear models used in this paper are artificial neural network (ANN) and adaptive neuro-fuzzy inference system (ANFIS), which represent the behavior of transformer insulation parameters. The nonlinear models are compared with multiple linear regression (MLR) which is a linear statistical model. The models are established with 80 percent of the experimental dataset. The other 20 percent of data are utilized for the efficiency assessment of the models. The results demonstrate that the models provide an assessment of the health condition of the transformers comparable to existing models with high accuracy. The contributions of this paper are: 1) Evaluating the overall HI of the transformer employing a complete set of 15 input parameters of transformer oil-paper insulation system. 2) Adding DGAF, %WaterPaper, IFT parameters and showing the importance of these parameters. 3) Regarding the condition of solid insulation of the transformer particularly. 4) Applying a diverse and large practical dataset composed of 336 different transformers located in different country areas. 5) Using the MLR method for three purposes. 6) Providing linear (MLR) and nonlinear (ANN, ANFIS) models for HI calculation of the dataset, simultaneously. 7) Verifying the applicability and efficiency of the ANFIS model for simulating HI value.

Daniel, J. J., Basoro, D., & Gebrie, M. (2021). An engineered alternative brick masonry unit for the poor inhabitants at hawassa village, ethiopia. *International Journal of Advanced Technology and Engineering Exploration*, 8(79), 717–734. Scopus. https://doi.org/10.19101/IJATEE.2021.874128

#### Abstract

The southern rural regions of Hawassa village, Ethiopia customarily practices Chika-pet and adobe masonry houses. They use soil, wood and teff straw adobe bricks in house construction, due to its extreme poverty and unsophisticated manner of living. These houses are unsustainable and flimsy due to its inclusion of easily degradable raw materials, non-engineered construction practice, poor earthquake resistance and rapid climatic uncertainties. Moreover, the soil utilized for the adobe brick making is consumed from far away distant regions by ignoring their native Hawassa soil due to its unsuitable brick making characteristics. This impacts the economical expenditure of the poor income inhabitants. Therefore, this research is intended to facilitate the Hawassa village inhabitants by improving their native soil characteristics on adding lime and considers it for brick unit formation. In addition, an alternative reinforcement called pineapple leaf fibre is introduced for the adobe brick making which enriches compressive and tensile strength at a satisfactory rate according to the California Building Standard Code (CBC) requirement. The maximum compressive strength is recorded as 4.1 MPa which is 6 times greater than the conventional specimens and flexural strength is recorded at an improved rate of 0.78 Mpa. It ensures the standard requirement according to the CBC code. As a result, a sustained residual tensile load is recorded which indicates an efficient improvement in the ductility failure of brick. The bending test data is processed to estimate young's modulus in tension highlighting the bi-modularity of the earthen composite material. The experimental correlation between various mechanical properties is presented and modelling design equations are proposed in the engineered manner of design/assessment purposes. A comparative study and cost analysis of the existing and proposed approach is discussed to validate the superiority of the proposed concept.

Sathish, T., Tharmalingam, S., Mohanavel, V., Ashraff Ali, K. S., Karthick, A., Ravichandran, M., & Rajkumar, S. (2021). Weldability Investigation and Optimization of Process Variables for TIG-Welded Aluminium Alloy (AA 8006). *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/2816338\_Conference Paper

Aluminium honeycomb sandwich panels have greater applications for constructions and Hexagonal aluminium design of satellites, missiles, aircraft, ships and also automobiles. To prevent failure of an important structure that subjected to stress, the aluminium honeycomb sandwich panels with face sheets act as protective mechanism. It is important to go for analysis study about stress and strain distribution on aluminium honeycomb with face sheets. In this investigation, it is focused on stress and strain distribution of sandwich structures, which were constructed of hexagonal aluminium core with glass fibre face sheets. The model of hexagonal aluminium sandwich panels with glass fibre face sheets will develop by using the Pro-E software. Further the stress and strain distribution for glass fibre face sheets with aluminium honeycomb will analyze by using ANSYS software. The ANSYS analysis carried out for the face sheets of 0.5 mm, 1 mm and 1.5 mm thicknesses with hexagonal aluminium honeycomb, which should be useful effectively for various applications.

Ashraff Ali, K. S., Suresh Kumar, S., Allen Jeffrey, J., Ravikumar, M. M., & Rajkumar, S. (2021). An insight into stress and strain analysis over on hexagonal aluminium sandwich honeycomb with various thickness glass fiber face sheets. 47, 493–499. Scopus. https://doi.org/10.1016/j.matpr.2021.05.038

#### Abstract

Mobile Ad hoc Network (MANET) is a group of self-directed, self-organizing and freely moving mobile nodes connected through wireless links, without the support of any central infrastructure. In MANET, every node has a freedom to cooperate in data packet forwarding. MANET is susceptible to various kinds of routing attacks because of its dynamicity, mobility, open medium, and lack of central administration. Thus, security in MANET routing protocol is a vital issue and needs a mechanism to protect communication between nodes. In MANET, a protrusive attack which reduces the network performance is Sybil attack which theft the identities of genuine nodes and impersonate them and drops the packets. In this Paper, Sybil attack detection and prevention (SDP) mechanism is proposed which works as an intrusion detection and prevention system to

detect and prevent the MANET against Sybil attack. The proposed SDP mechanism used historical profile analysis and blocking based mechanism that check the real-time as well as previous history of nodes to watch the behavior of Sybil node. Two scenarios of SDP mechanism have been implemented in NS-2 and evaluated with packet delivery ratio, normal routing load, delay and throughput. Accuracy of detection is checked with confusion matrix analysis and found that proposed system gives 90.7% and 97.85% true positive ratio in SDP-I and SDP-II scenarios respectively.

Vijayan, D. S., & Daniel, J. J. (2021). An investigation on the torsional effect of symmetric moment resisting frame system subjected to eccentric reinforced concrete lift wall—A finite element approach. *International Journal of Engineering Trends and Technology*, 69(8), 179–184. Scopus.

#### Abstract

The regular building structure consists of eccentric or unsymmetrical reinforced concrete lift walls made of shear walls leads to irregular Building in the plan due to uneven distribution of stiffness. Under the circumstance of such buildings located in the high seismic zone, the design engineer's responsibility becomes more challenging. Hence, the designer must understand the seismic response of irregular structures clearly. This research presents a comparative investigation on the lift wall structure located at the concentric and eccentric position, and it is subjected to lateral seismic load according to the Ethiopian building code. Here, a ground plus ten stories residential building is considered for the investigation, and linear static analysis is performed using the finite element method. In a nutshell, the eccentric lift wall is subjected to additional translation bending and rotational bending that produces an induced story deflection, leading to additional material requirement and is expensive compared to the concentric lift wall.

Sarathchandra, C., Abebe, Y. A., Wijerathne, I. L., Aluthwattha, S. T., Wickramasinghe, S., & Ouyang, Z. (2021). An overview of ecosystem service studies in a tropical biodiversity hotspot, Sri Lanka: Key perspectives for future research. *Forests*, *12*(5). Scopus. https://doi.org/10.3390/f12050540

#### Abstract

Tropical island countries are often highly populated and deliver immense ecosystem service benefits. As human wellbeing depends on these ecosystems, proper management is crucial in the resource-rich tropical lands where there is less related research. Though ecosystem service and biodiversity studies are a promising path to inform the ecosystem management for these mostly developing countries, published evidence of using ecosystem service studies in decision making is lacking. The purpose of this study is to provide an overview of ecosystem services and related research in Sri Lanka, examining trends and gaps in how these studies are conceptualized. Out of the considered 220 peer-reviewed articles, the majority of articles (48.2%) were terrestrial and forest related while coastal ecosystems were considered in 33.2% of studies. In most studies, the ecosystem service category studied was provisioning (31.5%) followed by regulatory service (28.7%). Studies investigating and quantifying ecosystem services, pressures on ecosystems, and their management were fewer compared to studies related to biodiversity or species introduction. Moreover, studies investigating the value of ecosystem services and biodiversity to the communities or involvement of stakeholders in the development of management actions regarding the ecosystem services were rare in Sri Lanka, and an intense focus from future studies in these aspects is timely and necessary.

# Ramkumar, G., Sahoo, S., Anitha, G., Ramesh, S., Nirmala, P., Tamilselvi, M., Subbiah, R., & Rajkumar, S. (2021). An Unconventional Approach for Analyzing the Mechanical Properties of Natural Fiber Composite Using Convolutional Neural Network. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/5450935

#### Abstract

Over the past few years, natural fiber composites have been a strategy of rapid growth. The computational methods have become a significant tool for many researchers to design and analyze the mechanical properties of these composites. The mechanical properties such as rigidity, effects,

bending, and tensile testing are carried out on natural fiber composites. The natural fiber composites were modeled by using some of the computation techniques. The developed convolutional neural network (CNN) is used to accurately predict the mechanical properties of these composites. The ground-truth information is used for the training process attained from the finite element analyses below the plane stress statement. After completion of the training process, the developed design is authorized using the invisible data through the training. The optimum microstructural model is identified by a developed model embedded with a genetic algorithm (GA) optimizer. The optimizer converges to conformations with highly enhanced properties. The GA optimizer is used to improve the mechanical properties to have the soft elements in the area adjacent to the tip of the crack.

Khan, B., Tesfaye, M., Mahela, O. P., Alhelou, H. H., Gupta, N., Khosravy, M., Senjyu, T., & Guerrero, J. M. (2021). Analysing integration issues of the microgrid system with utility grid network. *International Journal of Emerging Electric Power Systems*, 22(1), 113–127. Scopus. https://doi.org/10.1515/ijeeps-2020-0170

#### Abstract

Generation of renewable energy sources and their interfacing to the main system has turn out to be most fascinating challenge. Renewable energy generation requires stable and reliable incorporation of energy to the low or medium voltage networks. This paper presents the microgrid modeling as an alternative and feasible power supply for Institute of Technology, Hawassa University, Ethiopia. This microgrid consists of a 60 kW photo voltaic (PV) and a 20 kW wind turbine (WT) system; that is linked to the electrical distribution system of the campus by a 3-phase pulse width modulation scheme based voltage source inverters (VSI) and supplying power to the university buildings. The main challenge in this work is related to the interconnection of microgrid with utility grid, using 3-phase VSI controller. The PV and WT of the microgrid are controlled in active and reactive power (PQ) control mode during grid connected operation and in voltage/frequency (V/F) control mode, when the microgrid is switched to the stand-alone operation. To demonstrate the feasibility of proposed microgrid model, MATLAB/Simulink software has been employed. The performance of fully functioning microgrid is analyzed and simulated for a number of operating conditions. Simulation results supported the usefulness of developed microgrid in both mode of operation.

Senthilnathan, K., Ravi, R., Stephen Leon, J., Suresh, G., Manikandan, K., & Lavanya, R. (2021). Analysing the effect of mechanical properties of various proportions of filler material on jute fibre/epoxy reinforced composites. 1921(1). Scopus. https://doi.org/10.1088/1742-6596/1921/1/012089\_ Conference Paper

### Abstract

In the earlier stage of 1500 BC' S composites were invented. The initial stage of composites was created with the help of mixing the mud and straw for construction purpose, in order to build strong and durable component in the view, to ensure the longer life on the products. After some years, the usage of composite materials is become more, depends on different applications such as appliances, construction, electrical distribution, energy and marine usages and so on. Since the past few decades' natural fibres plays a vital role in structural applications such as ease of fabrication, low cost, high durability, and for low thermal properties. In the present experimental investigation work, jute fiber has been chosen as the reinforcement agent along with the epoxy matrix material. With help of the hand layup technique the composites have been fabricated along with the standard ratio of (3% & 6%) calcium carbonate as the filler material. The fabricated jute fiber reinforced epoxy matrix (standard ratio of calcium carbonate filler) laminate were cut as per the ASTM standards to do the tests like tensile, flexural & impact, in order to completely analyse the physical strengths of the laminate, and the same data's were compared with filler materials and without filler material. At last the fractured surfaces were thoroughly investigated with help of scanning electron microscope to understand the morphological behaviour of the fabricated composite.

Zigene, Z. D., Asfaw, B. T., & Bitima, T. D. (2021). Analysis of genetic diversity in rosemary (Salvia rosemarinus Schleid.) using SSR molecular marker for its management and sustainable use in Ethiopian genebank. *Genetic Resources and Crop Evolution*, 68(1), 279–293. Scopus. https://doi.org/10.1007/s10722-020-00984-7

#### Abstract

Rosemary (Salvia rosemarinus Schleid.) is cultivated worldwide due to its diverse uses as spice, preservative and medicine against many illnesses. Even though rosemary is widely grown in Ethiopia, the genetic diversity of available germplasms was not assessed. Therefore, this experiment was designed to analyze the genetic diversity of Ethiopian rosemary for further breeding activities. Genetic diversity of 45 rosemary accessions collected from different parts of Ethiopia was analyzed using 12 simple sequence repeat markers. A total of 189 alleles were detected, and the number of alleles per marker (Na) ranged from 7 to 27 with an average of 15.75. About 56.6% of the alleles were rare (frequency < 0.05), whereas 23.8% and 19.6% were intermediate (frequency 0.05–0.5) and abundant (frequency > 0.5), respectively. Polymorphic information content per marker ranged from 0.74 to 0.94, with an average value of 0.87. The result depicted over all polymorphism of 92.6%, indicating the existence of high genetic variability among the accessions. The average values of expected (HE) and observed (HO) heterozygosities were 0.65 and 0.35, respectively. The average HO was lower than HE, showed heterozygote deficiency due to restricted cross-fertilization. Analysis of molecular variance revealed that within populations variations contributed more to the genetic diversity than between population variations. Unweighted Neighbor Joining based phylogenetic analysis, Principal Coordinate analysis and STRUCTURE analysis showed admixture of the populations, confirming that the sample groupings did not strictly follow the geographic origin of the accessions. Therefore, improvement program of the crop should focus on actual diversity, not on area of growing.

Wassie, Y. T., & Adaramola, M. S. (2021a). Analysis of potential fuel savings, economic and environmental effects of improved biomass cookstoves in rural Ethiopia. *Journal of Cleaner Production*, 280. Scopus. https://doi.org/10.1016/j.jclepro.2020.124700

#### Abstract

Unsustainable utilization of solid biomass fuels with inefficient traditional cookstoves has long been a major challenge to ensuring energy and environmental security in Ethiopia. Against the backdrop of this problem, several models of improved biomass cookstoves (ICSs) have been developed and distributed in the country. Yet, little is known about the effect of these ICSs on household's fuelwood consumption and the environment. The aim of this study was to examine the potential woodfuel savings, economic and environmental effects of three ICSs (Mirt, Gonziye, and Tikikil) in rural Ethiopia from a cross-sectional study of 605 sample households and direct energy consumption measurements in four rural districts. Inferential statistics and costbenefit analysis were used to analyse the data. The results showed that compared with the traditional open fire tripod; the use of ICSs could reduce household's fuelwood consumptions on average by 1.72–2.08 tons per household per year. These fuelwood savings translate to potential emissions reductions of 2.82–3.43 tCO2e per stove per year. The results from the cost-benefit analysis (CBA) indicated that investment in these ICSs could provide a net economic benefit of ETB 7204 to 10,381 (US\$ 265 to 382) during the 2-5 years lifespan of the stoves. The benefit-cost ratios of these ICSs were calculated between 16.5:1 and 35.0:1. The implication is that promoting the use of Mirt, Gonziye and Tikikil stoves is a viable option and an essential component of the strategy for improving the energy-efficiency and well-being of rural communities while also contributing to the sustainable utilization of biomass resources, and mitigation of climate change in Ethiopia and beyond.

# Tilahun, S., Paramasivam, V., Tufa, M., Kerebih, A., & Selvaraj, S. K. (2021). Analytical investigation of Pelton turbine for mini hydro power: For the case of selected site in Ethiopia. 46, 7364–7368. Scopus. https://doi.org/10.1016/j.matpr.2020.12.1038\_Conference

#### Abstract

The present work shows the design of a Pelton turbine for micro hydropower. This present work aims to design a Pelton turbine for micro hydropower that can produce a maximum power output of 32kw using water resources available in Ethiopia & apos;s rural areas with a maximum head of 15m. This present work also includes designing each component of the Pelton turbine and selecting material for each component. In this work, design calculations and detailed drawings are also shown. The design results are tabulated based on variable head and flow rate. Material selection and the reason behind the selection are shown based on criteria predetermined. Finally, the conclusion is derived from the result analysis. If the distribution of the annual flow rate of water varies, the designed turbine will work up to a minimum flow rate of 0.15m3/s delivering a minimum of 19.04kW output power. This turbine will also work under the variable head of 10m to 15m range, delivering appropriate power. This turbine will give 31.74kW power under a full head of 15m and 19.04kW power under a minimum head of 10m. The designed turbine can be used effectively for improving power shortage around rural areas of Ethiopia. It will give 31.74kW output power if it works under full head and flow rate. It will serve 317 households living in a rural area, assuming each household consumes 100W.

Kinyoki, D., Osgood-Zimmerman, A. E., Bhattacharjee, N. V., Schaeffer, L. E., Lazzar-Atwood, A., Lu, D., Ewald, S. B., Donkers, K. M., Letourneau, I. D., Collison, M., Schipp, M. F., Abajobir, A., Abbasi, S., Abbasi, N., Abbasifard, M., Abbasi-Kangevari, M., Abbastabar, H., Abd-Allah, F., Abdelalim, A., ... Hay, S. I. (2021). Anemia prevalence in women of reproductive age in low- and middle-income countries between 2000 and 2018. *Nature Medicine*, *27*(10), 1761–1782. Scopus. https://doi.org/10.1038/s41591-021-01498-0

# Abstract

Anemia is a globally widespread condition in women and is associated with reduced economic productivity and increased mortality worldwide. Here we map annual 2000–2018 geospatial estimates of anemia prevalence in women of reproductive age (15–49 years) across 82 low- and middle-income countries (LMICs), stratify anemia by severity and aggregate results to policy-relevant administrative and national levels. Additionally, we provide subnational disparity analyses to provide a comprehensive overview of anemia prevalence inequalities within these countries and predict progress toward the World Health Organization's Global Nutrition Target (WHO GNT) to reduce anemia by half by 2030. Our results demonstrate widespread moderate improvements in overall anemia prevalence but identify only three LMICs with a high probability of achieving the WHO GNT by 2030 at a national scale, and no LMIC is expected to achieve the target in all their subnational administrative units. Our maps show where large within-country disparities occur, as well as areas likely to fall short of the WHO GNT, offering precision public

health tools so that adequate resource allocation and subsequent interventions can be targeted to the most vulnerable populations.

Lire, T., Megerssa, B., Asefa, Y., & Hirigo, A. T. (2021). Antenatal care service satisfaction and its associated factors among pregnant women in public health centres in Hawassa city, Southern Ethiopia. *Proceedings of Singapore Healthcare*. Scopus. https://doi.org/10.1177/20101058211007881

# Abstract

#### Background

Self-reported client satisfaction is vital in order to address service provider and facility-based factors that can be upgraded to maximise antenatal care (ANC) satisfaction and utilisation in service-providing institutions.

# Objective

This study aimed to assess ANC service satisfaction and associated factors among pregnant women attending Hawassa city public health centres (HC), Sidama regional state, Southern Ethiopia. Methods: This health facility–based cross-sectional study was conducted on 422 pregnant women from 14 March to 13 April 2017. Exit interview data were collected from pregnant women attending care service at five randomly selected public HC.

#### Results

Overall, 79.2% were satisfied with the ANC service. As per specific components, 74.2% of respondents were satisfied with the information provided, and 74.2% were satisfied with the institution's health care. Respondents who had received iron tablets were 3.2 times more likely to be satisfied than their counterparts (adjusted odds ratio (AOR)=3.2, 95% confidence interval (CI) 1.7–5.9). Pregnant women who were counselled on human immunodeficiency virus infection and its testing were 4.3 times more likely to be satisfied than those who had not received such counselling (AOR=4.3, 95% CI 2.2–8.4). Also, those women who waited  $\leq$ 30 minutes (AOR=2.6, 95% CI 1.2–5.5) and who received information on foetal movement (AOR=3.5, 95% CI 1.8–6.5) were significantly associated with ANC service satisfaction.

#### Conclusion

More than 20% of pregnant women were not satisfied with ANC services. This reflects a need for attention in each aspect of health-care service provision in order to assure client satisfaction.

Deyno, S., Mtewa, A. G., Hope, D., Bazira, J., Makonnen, E., & Alele, P. E. (2021). Antibacterial Activities of Echinops kebericho Mesfin Tuber Extracts and Isolation of the Most Active Compound, Dehydrocostus Lactone. *Frontiers in Pharmacology*, *11*. Scopus. https://doi.org/10.3389/fphar.2020.608672

#### Abstract

Echinops kebericho Mesfin is traditionally used for the treatment of various infectious diseases. This study investigated antibacterial activity of the essential oil (EO) and the different fractions of ethanol extract. The most active component was isolated and identified. Isolation and purification was accomplished using chromatographic techniques while identification was done by spectroscopic method. Minimum inhibitory concentration (MIC) was determined using the broth micro-dilution method. In bioactive-guided isolation, percent inhibition was determined using optical density (OD) measurement. The MICs of the essential oil ranged from 78.125 µg/ml to 625 µg/ml, and its activity was observed against methicillin-resistant Staphylococcus aureus (MRSA, NCTC 12493). Ethyl acetate fraction showed high activity against MRSA (NCTC 12493), MIC = 39.075 µg/ml followed by Enterococcus faecalis (ATCC 49532), MIC = 78.125  $\mu$ g/ml and was least active against Klebsiella pneumoniae (ATCC 700603), MIC = 1,250 µg/ml. MIC of hexane fraction ranged from 156.2 µg/ml to Escherichia coli (ATCC 49532) to 1,250 µg/ml to E. coli (NCTC 11954). The MICs of chloroform fraction ranged from 312.5 to  $2500 \mu g/ml$ ; while butanol fraction could be considered pharmacologically inactive as its MIC value was 2,500 µg/ml for all and no activity against E. coli (NCTC 11954). Dehydrocostus lactone was successfully isolated and identified whose MIC was 19.53 µg/ml against MRSA. Dehydrocostus lactone isolated from E. kebericho M. showed noteworthy antibacterial activity which lends support to ethnopharmacological use of the plant. Further optimization should be done to improve its antibacterial activities and pharmacokinetic profile.

Dagne, E., Dobo, B., & Bedewi, Z. (2021). Antibacterial Activity of Papaya (Carica papaya) Leaf and Seed Extracts Against Some Selected Gram-Positive and Gram- Negative Bacteria. *Pharmacognosy Journal*, *13*(6), 1727–1733. Scopus. https://doi.org/10.5530/pj.2021.13.223

#### Abstract

#### Background

Medicinal plants are well-known natural sources of remedies, used in the treatment of innumerable diseases since antiquity. Wide range of medicinal plant extracts are used to treat several infections as they have potential antimicrobial activity.

# **Objectives**

This study was aimed to investigate antibacterial activity of Carica papaya leaf and seed with different solvents against Gram negative and Gram positive bacteria. The leaves and seeds of Carica papaya were dried, powdered and extracted with 80% of Acetone, Ethanol, Methanol and water. Disc diffusion method was used for the antibacterial assay and measuring the zone of inhibition, and the MIC was determined by broth macro dilution method.

#### Results

The highest percent yield of crude extract72.5% was obtained from Carica papaya leaf with Methanol, Ethanol and Acetone as solvents while, the lowest yield 24% was obtained from Carica papaya seed with Acetone extract. All Crude extracts from the different plant parts showed antibacterial activity. Accordingly, Carica papaya Seed with Ethanol extract exhibited the highest antibacterial activity  $14.3\pm1.2$  (mm) against P. aeruginosa which was lower than standard antibiotic disc Ciprofloxacin with inhibition zone of  $25.9\pm0.00$  (mm), while the lowest inhibition of  $3.8\pm0.5$  (mm) was recorded from Carica papaya leaf with Ethanol crude extract against E. coli. The MIC of 12.5mg/ml was observed from Ethanol crude extract of Carica papaya seed on P. aeruginosa. Crude seed extract of Ethanol showed the highest antibacterial activity. The results of the antibacterial assay of the crude extract of Carica papaya (leaf and seed) with four different solvents showed zone of inhibition against all tested bacteria. However, among the plant parts of Carica papaya included in the current study, the seed of Carica papaya were found to be the best source of antibacterial agents.
#### Conclusion

In this study, limited (only leaf and seed parts) of Carica papaya was tested for its antimicrobial activity. So, the same work should be carried out on different parts of Carica papaya plant like; bark, root, flower and fruits on antibacterial activities so, as to have a clear picture of the spectrum of antibacterial activity of the plant.

Bekele, E. K., Nosworthy, M. G., Tyler, R. T., & Henry, C. J. (2021). Antioxidant capacity and total phenolics content of direct-expanded chickpea–sorghum snacks. *Journal of Food Processing and Preservation*, 45(5). Scopus. https://doi.org/10.1111/jfpp.15439

#### Abstract

This study examined the effect of extrusion conditions on the antioxidant capacity (DPPH and ABTS) and total phenolics content of direct-expanded chickpea-sorghum snacks. The effect of extraction solvent on the antioxidant capacity (DPPH) detected also was determined. Chickpeasorghum blends (50:50, 60:40, and 70:30, chickpea:sorghum, w/w) were extruded at 10 combinations of moisture content (16, 18, and 20%) and barrel temperature (120, 140, and 160°C) and at 169°C and 15% moisture, maximum extrudate expansion conditions. DPPH radical inhibition percentages of acetone–water and ethanol–water extracts were higher (p < .05) than those of hexane extracts. Total phenolics contents ranged from 1 to 7 mg gallic acid equivalents/g. Extrusion, higher barrel temperature, and a larger proportion of sorghum in the blend increased (p <.05) DPPH radical inhibition, Trolox equivalents, and total phenolics content, whereas higher moisture content decreased (p < .05) these values. The 50:50 chickpea:sorghum blend extruded at 160°C and 16% exhibited the highest antioxidant capacity and total phenolics. Practical applications: Extruded snacks are susceptible to oxidation due to their porous structure. Chickpeasorghum expanded snacks are even more subject to oxidation as chickpea has a relatively high-fat content. This study demonstrated that a higher level of sorghum in chickpea-sorghum snacks increased antioxidant capacity and total phenolics content, implying sorghum can play a major role in increasing the oxidative stability of the snacks. Extrusion parameters such as barrel temperature and feed moisture content also impacted the antioxidant capacity and total phenolics content of the snacks. Acetone-water and ethanol-water were superior to hexane for extracting antioxidants.

# Takele, A., Melesse, A., & Taye, M. (2021). APPLICATION OF MULTIVARIATE ANALYSIS TO DIFFERENTIATE HARARGHE HIGHLAND GOAT POPULATIONS REARED IN THE WEST HARARGHE ZONE, ETHIOPIA. *Chilean Journal of Agricultural and Animal Sciences*, 37(3), 209–220. Scopus. https://doi.org/10.29393/CHJAAS37-23AMAM30023

#### Abstract

Multivariate analysis of morphological variables has been successfully used to estimate genetic variation within and between local breeds. The objective of this study was to differentiate Hararghe highland goat populations based on their morphometric traits by applying multivariate analysis. Sixteen morphometric traits were collected from 450 goats reared in the three agroecological zones (highland, midland and lowland) of West Hararghe. Multivariate canonical discriminant analysis in combination with cluster and discriminant analysis was applied to identify the combination of variables that differentiate goats of the three agroecological zones. The results indicated that all the morphometric traits were significantly affected by age. The cluster analysis indicated that two main groups of midland goats were included in one group, while group two included highland and lowland goats under one sub-cluster. The canonical discriminant analysis identified two canonical variables (CAN) of which CAN1 and CAN2 accounted for 68.2 and 31.8% of the total variation, respectively. The quadratic discriminant analysis correctly assigned the respective 71.3, 77.3, and 81.3% of lowland, midland, and highland goat populations into their source populations, with an overall accuracy rate of 76.7%. The Mahalanobis distance verified that lowland and highland goats are the closest, while midland and highland goats were the furthest. However, the canonical discriminant analysis indicated a visible overlapping between goat populations of the three agroecological zones, indicating the existence of homogeneity among them. In conclusion, multivariate analysis identified 11 morphometric traits as the most imperative traits to differentiate Hararghe highland goat populations effectively. Genetic potentials of Hararghe highland goat populations can be improved through community-based breeding programs for their sustainable utilization and conservation.

Padmanaban, S., Dhanamjayulu, C., & Khan, B. (2021). Artificial Neural Network and Newton Raphson (ANN-NR) Algorithm Based Selective Harmonic Elimination in Cascaded Multilevel Inverter for PV Applications. *IEEE Access*, *9*, 75058–75070. Scopus. https://doi.org/10.1109/ACCESS.2021.3081460

#### Abstract

In this article, a hybrid Artificial Neural Network -Newton Raphson (ANN-NR) is introduced to mitigate the undesired lower-order harmonic content in the cascaded H-Bridge multilevel inverter for solar photovoltaic (PV). Harmonics are extracted by the excellent choice of opting switching angles by exploiting the Selective Harmonic Elimination (SHE) PWM technique accompanying a unified algorithm in order to optimize and reduce the Total Harmonic Distortion (THD). ANN is trained with optimum switching angles, and the estimates generated by the ANN are the initial guess for NR. In this study, the CHB-MLI is combined with a traditional boost converter, it boosts the PV voltage to a superior dc-link voltage Perturb and Observe (P&O) based Maximum Power Point Tracking (MPPT) algorithm is used for getting a stable output and efficient operation of solar PV. The proposed system is proved over an eleven-level H-bridge inverter, the work is carried out in MATLAB/Simulink environment, and the respective results are confirmed that the proposed technique is efficient, and offers an actual firing angles with a few iterations results in a better capability of confronting local optima values. The suggested algorithm is justified by the experimental development of eleven-level cascaded H-bridge inverter.

#### Padmanaban, S., Dhanamjayulu, C., & Khan, B. (2021). Artificial Neural Network and Newton Raphson (ANN-NR) Algorithm Based Selective Harmonic Elimination in Cascaded Multilevel Inverter for PV Applications. *IEEE Access*, 9, 75058–75070. Scopus. https://doi.org/10.1109/ACCESS.2021.3081460

#### Abstract

In this article, a hybrid Artificial Neural Network-Newton Raphson (ANN-NR) is introduced to mitigate the undesired lower-order harmonic content in the cascaded H-Bridge multilevel inverter for solar photovoltaic (PV). Harmonics are extracted by the excellent choice of opting switching angles by exploiting the Selective Harmonic Elimination (SHE) PWM technique accompanying a unified algorithm in order to optimize and reduce the Total Harmonic Distortion (THD). ANN is

trained with optimum switching angles, and the estimates generated by the ANN are the initial guess for NR. In this study, the CHB-MLI is combined with a traditional boost converter, it boosts the PV voltage to a superior dc-link voltage Perturb and Observe (PO) based Maximum Power Point Tracking (MPPT) algorithm is used for getting a stable output and efficient operation of solar PV. The proposed system is proved over an eleven-level H-bridge inverter, the work is carried out in MATLAB/Simulink environment, and the respective results are confirmed that the proposed technique is efficient, and offers an actual firing angles with a few iterations results in a better capability of confronting local optima values. The suggested algorithm is justified by the experimental development of eleven-level cascaded H-bridge inverter.

### Asfaw, B. T., Worojie, T. B., & Mengesha, W. A. (2021). Assessing morphological diversity in Ethiopian yams (Dioscorea spp.) and its correspondence with folk taxonomy. *Systematics and Biodiversity*, 19(5), 471–487. Scopus. https://doi.org/10.1080/14772000.2021.1890269

#### Abstract

This study was conducted with the objective to investigate the diversity of wild and cultivated yams based on morphological characters and to assess its correspondence with folk taxonomy. The local classification system in South-west Ethiopia was studied by recording attributes of each landrace used in the folk taxonomy. Farmers differentiate various named plants based on variations in morphological, physiological, plant cycle and tuber quality attributes. A total of 75 accessions representing 30 differently named landraces were assessed using 37 qualitative and 13 quantitative characters. Principal component analysis showed that all the traits used were useful for capturing the variability among accessions. Traits such as leaf position, twining direction, type of tuber, petiole colour on young leaves, the entire wing traits, flowering and size of leaves were useful for capturing the variability among species. All the other traits were useful for capturing the variability among accessions of the same and different species. The cluster study separated the 75 accessions into four and five major clusters based on qualitative and quantitative traits, respectively. The study indicates that the local classification corresponds well with the morphological variability, but farmers somewhat underestimate the diversity of yams at lower level taxa. Our study shows the existence of high phenotypic polymorphism among accessions, which could be exploited, if improvement need arises. Yet, regarding the validity of member species in the D. cayenensis complex, many questions remain confusing, and will need to be solved with DNA-based studies.

Melesse, A., Tadele, A., Assefa, H., Taye, K., Kebede, T., Taye, M., & Betsha, S. (2021). Assessing the morphological diversity of ethiopian indigenous chickens using multivariate discriminant analysis of morphometric traits for sustainable utilization and conservation. *Poultry Science Journal*, 9(1), 61–72. Scopus. https://doi.org/10.22069/psj.2021.18469.1644

#### Abstract

This study aimed to differentiate indigenous chicken populations of four administrative zones including Kaffa, Sheka, Metekel, and Bale based on morphometric measurements using multivariate analysis. Data on quantitative traits were collected from 3069 adult indigenous chickens of both sexes. Live weight (LW), body length (BL), breast circumference (BC), wingspan (WS), shank length (SL), shank circumference (SC), keel length (KL), back length (BkL), and neck length (NL) were recorded. A cluster and discriminant analysis was applied to identify the combination of variables that best differentiate among chicken populations. Results indicated that Metekel chickens were characterized by higher LW, BL, KL, and BkL and differed from other groups (P < 0.05). Sheka chickens demonstrated the highest BC, WS, SL, SC, and NL being different from others (P < 0.05). Cluster analysis generated two distinct groups in which chickens of Bale and Sheka were clustered in one group while those of Metekel and Kaffa in another group each separated with sub-clusters. All Mahalanobis distances among the four chicken populations were significant being the shortest between Sheka and Bale chickens and the longest between those of Metekel and Bale (P < 0.0001). Three statistically significant (P < 0.001) canonical variables (CAN) were extracted of which CAN1 and CAN2 accounted for 73.2 and 14.6% of the total variations, respectively. The scatter plot generated by canonical discriminant analysis showed that CAN1 effectively discriminated between chickens of Metekel and Kaffa while the CAN2 best discriminated against those of Bale and Sheka. The discriminant analysis correctly classified 95.3, 94.9, 92.3, and 82.2% of Metekel, Bale, Kaffa, and Sheka chickens into their origin population, respectively. The current study revealed that multivariate analysis of morphometric traits provided a practical basis for differentiating the indigenous chicken populations into different groups. However, the authors recommend genetic characterization studies to validate the detected morphometric-based differentiation in chicken populations.

Lencha, S. M., Tränckner, J., & Dananto, M. (2021). Assessing the water quality of lake hawassa Ethiopia—Trophic state and suitability for anthropogenic uses—Applying common water quality indices. *International Journal of Environmental Research and Public Health*, 18(17). Scopus. https://doi.org/10.3390/ijerph18178904

#### Abstract

The rapid growth of urbanization, industrialization and poor wastewater management practices have led to an intense water quality impediment in Lake Hawassa Watershed. This study has intended to engage the different water quality indices to categorize the suitability of the water quality of Lake Hawassa Watershed for anthropogenic uses and identify the trophic state of Lake Hawassa. Analysis of physicochemical water quality parameters at selected sites and periods was conducted throughout May 2020 to January 2021 to assess the present status of the Lake Watershed. In total, 19 monitoring sites and 21 physicochemical parameters were selected and analyzed in a laboratory. The Canadian council of ministries of the environment (CCME WQI) and weighted arithmetic (WA WQI) water quality indices have been used to cluster the water quality of Lake Hawassa Watershed and the Carlson trophic state index (TSI) has been employed to identify the trophic state of Lake Hawassa. The water quality is generally categorized as unsuitable for drinking, aquatic life and recreational purposes and it is excellent to unsuitable for irrigation depending on the sampling location and the applied indices. Specifically, in WA WQI, rivers were excellent for agricultural uses and Lake Hawassa was good for agricultural uses. However, the CCME WQI findings showed rivers were good for irrigation but lake Hawassa was marginal for agricultural use. Point sources were impaired for all envisioned purposes. The overall category of Lake Hawassa falls under a eutrophic state since the average TSI was 65.4 and the lake is phosphorous-deficient, having TN:TP of 31.1. The monitored point sources indicate that the city of Hawassa and its numer-ous industrial discharges are key polluters, requiring a fast and consequent set-up of an efficient wastewater infrastructure, accompanied by a rigorous monitoring of large point sources (e.g., in-dustry, hospitals and hotels). In spite of the various efforts, the recovery of Lake Hawassa may take a long time as it is hydrologically closed. Therefore, to ensure safe drinking water supply, a central supply system according to World Health organization (WHO) standards also for the fringe inhab-itants still using lake water is imperative. Introducing riparian buffer zones of vegetation and grasses can support the direct pollution alleviation measures and is helpful to reduce the dispersed pollution coming from the population using latrines. Additionally, integrating aeration systems like pumping atmospheric air into the bottom of the lake using solar energy panels or diffusers are ef-fective mitigation measures that will improve the water quality of the lake. In parallel, the implementation and efficiency control of measures requires coordinated environmental monitoring with dedicated development targets.

## Mosisa, A., Nurfeta, A., Bezabih, M., Tolera, A., Mengistu, S., Yigrem, S., & Hassen, A. (2021). Assessment of botanical composition, biomass yield, nutritional quality and methane production of forages in selected grasslands, southern highlands of Ethiopia. *Scientific African*, *12*. Scopus. https://doi.org/10.1016/j.sciaf.2021.e00726

#### Abstract

A study was conducted to assess botanical composition, biomass yield, nutritive value and methane production of forages in the grasslands of Kofele district in West Arsi Zone of Oromia National Regional State, southern Ethiopia. Three patches of the grassland including protected grassland, private grazing land used by smallholder farmers and ranch were selected for the study to represent three different grazing land management practices. Quadrats of 0.5 m  $\times$  0.5 m were used to determine biomass yield and collect samples of herbaceous forages from each site (12 quadrats from each site). For woody species four 10 m  $\times$  10 m plots were established along transect of 200 m with 20 m distance between plots to identify available species (in the ranch only). A total of 20 herbaceous species were identified, out of which 45% were grasses, 15% legumes, 10% sedges and 30% forbs. Out of 17 browse species identified in the ranch, 47.1% were trees while 52.9% were shrubs. The total biomass production from protected grassland (4.34 t/ha) was higher (P<0.05) than that of private grazing land (3.66 t/ha) and ranch (3.76 t/ha). Biomass production of sedge and forbs were the highest (P<0.05) in ranch. The ranges of chemical constituents for grasses were 8.44-10.74%, 52.8-72%, 27.7-37.4%, 3.1-5.6%, 58.2-76% for crude protein (CP), neutral detergent fiber (NDF), acid detergent fiber (ADF), acid detergent lignin (ADL) and in vitro dry matter digestibility (IVDMD), respectively. The CP and IVDMD for legumes varied from 15.64-20.33% and 80.1–85–1%, respectively. For browses the ranges of CP and IVDMD were 15.41– 27.19% and 57.4–81.9%, respectively. Among grass species, Eragrostis botryodes generated less methane. In general, legumes (5.5-6.5 mL/200 mg) and sedge (6 mL/200 mg) produced less

amount of methane compared with grasses (7–10.5 mL/200 mg). Browses (9.5–13.5 mL/200 mg) produced more methane compared with herbaceous species (5.5–10.5 mL/200 mg). In conclusion protecting grassland and using cut and carry feeding system promoted more herbage production. The CP content of grass is generally good but supplementation with legumes and browses are required in practical feeding. The use of legumes with grasses and other browse species is recommended as a feeding strategy to reduce methane production However; further investigations on animal response trials are suggested to see the potential of these feed resources.

### Girmay, G., Moges, A., & Muluneh, A. (2021). Assessment of Current and Future Climate Change Impact on Soil Loss Rate of Agewmariam Watershed, Northern Ethiopia. *Air, Soil and Water Research*, *14*. Scopus. https://doi.org/10.1177/1178622121995847

#### Abstract

Soil erosion is 1 of the most important environmental problems that pose serious challenges to food security and the future development prospects of Ethiopia. Climate change influences soil erosion and is critical for the planning and management of soil and water resources. This study aimed to assess the current and future climate change impact on soil loss rate for the near future (2011-2040), middle future (2041-2070), and far future (2071-2100) periods relative to the reference period (1989-2018) in the Agewmariam watershed, Northern Ethiopia. The 20 models of Coupled Model Intercomparison Project phase 5 global climate models (GCMs) under Representative Concentration Pathway (RCP) 4.5 (intermediate scenario) and 8.5 (high emissions scenario) scenarios were used for climate projection. The statistical bias correction method was used to downscale GCMs. Universal Soil Loss Equation integrated with geographic information system was used to estimate soil loss. The results showed that the current average annual soil loss rate and the annual total soil loss on the study area were found to be 25 t ha-1 year-1 and 51 403.13 tons, respectively. The soil loss has increased by 3.0%, 4.7%, and 5.2% under RCP 4.5 scenarios and 6.0%, 9.52%, and 14.32% under RCP 8.5 scenarios in the 2020s, 2050s, and 2080s, respectively, from the current soil loss rate. Thus, the soil loss rate is expected to increase on all future periods (the 2020s, 2050s, and 2080s) under both scenarios (RCP 4.5 and RCP 8.5) due to the higher erosive power of the future intense rainfall. Thus, climate change will exacerbate the existing soil erosion problem and would need for vigorous new conservation policies and investments to mitigate the negative impacts of climate change on soil loss. © The Author(s) 2021.

#### Chikako, T. U., & Hamu, G. T. (2021). Assessment of Customers' Relationship Management Practices on Customer Retention and Loyalty of Oromia Credit and Saving Share Company: Bule Hora City Branch. *Advances in Operations Research*, 2021. Scopus. https://doi.org/10.1155/2021/5545836

#### Abstract

The main objective of this study was to assess customers' relationship management practices of Oromia Credit and Saving Share Company, Bule Hora city branch in Bule Hora, Ethiopia. Customer relationship management (CRM) as a strategy has gained tremendous interest among researchers and practitioners in recent times. Thus, this study tried to assess the status and ways CRM has been put in for practice by Oromia Credit and Saving Share Company (OCSSCO). In addition, this study considers different CRM dimensions such as empathy, bonding and satisfaction, and responsiveness. To achieve the objective of the study, primary data were collected through a questionnaire from a sample of 246 Oromia Credit and Saving Share Company customers of Bule Hora city branch, Bule Hora, Ethiopia, by using simple random sampling technique. The data collected through the questionnaire were analyzed using descriptive statistical analysis method and inferential statistics by using SPSS version 20 as a tool of data analysis. The study clearly revealed that the four CRM dimensions are strongly related. Thus, from the perspective of customers as well as management bodies of the Oromia Credit and Saving Share Company, CRM has a significant influence on customer retention and loyalty of the organization. Generally speaking, microfinance institutions are in need of doing a lot of CRM-based customerfocused practices.

Yasin, G., Elias, U., Walelign, W., & Hussein, M. (2021). Assessment of genetic diversity in cowpea (Vigna unguiculata) genotypes in Southern Ethiopia based on Morpho-Agronomic traits. *International Journal of Agricultural Technology*, *17*(4), 1631–1650. Scopus.

#### Abstract

A field experiment was conducted at Gofa research station in the main crop season of 2016/17 to estimate the genetic diversity among cowpea genotypes based on morpho-Agronomic traits. Thirty-six cowpea genotypes were tested using a simple lattice design. Shannon diversity Index value ranged from 0.633 to 0.953 with a mean of 0.84 confirmed that there was a high degree of deviation in the qualitative traits among cowpea genotypes. Analysis of variance for 14 quantitative traits showed significant differences (P 0.05) among the cowpea genotypes. Yield and other agronomic traits showed high to moderate phenotypic (PCV) and genotypic coefficient of variation (GCV). On the basis of cluster analysis, thirty-six cowpea genotypes, based on the 14 quantitative traits, were grouped into 6 clusters. I, II, IV, V, III and VI, each with 9, 8,7,7,3 and 2 genotypes, respectively. The highest inter-cluster distance was noticed between cluster III and VI (4265.10) followed by cluster III and V (3569.30), cluster IV and VI (3365.38) suggesting wide diversity between them. Cluster III was found to be promising for yield and its major component traits, while the genotypes in Cluster VI had genotypes for earlier flowering and maturity. Therefore, clusters III, V and VI genotypes could be used as directly in multi-location trials for their suitability to be released for successful cowpea production or could be source materials for obtaining desirable new recombinants for early maturity and higher yield in South Ethiopia.

## Berassa, M. S., Chiro, T. A., & Fanta, S. (2021). Assessment of job satisfaction among pharmacy professionals. *Journal of Pharmaceutical Policy and Practice*, 14(1). Scopus. https://doi.org/10.1186/s40545-021-00356-1

#### Abstract

#### Background

Job satisfaction of pharmacy professionals is appreciably related to quality of pharmaceutical care. Poor Job satisfaction is associated with low productivity, absenteeism, high turnover and reduced working hours. Little is known about job satisfaction and its related factors among pharmacy professionals in Tikur Anbessa Specialized Hospital. Therefore, the current study is aimed to assess the level of job satisfaction among pharmacy professionals working in Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia.

#### Methods

Institutional based cross sectional study was conducted among 80 pharmacy professionals working in Tikur Anbessa specialized hospital in Addis Ababa, Ethiopia from January to April 2019. The census sampling technique was used and data were collected using semi-structured selfadministered questionnaire. Statistical analysis was carried out using the Statistical Package for the Social Sciences version 21.0.

#### Result

Among 85 participants, 80 responded to the questionnaires completely that makes the response rate of 94%. A majority of the respondents were female (63.8%), with age group 30–39 years (57.5%), own bachelor degree (89.0%), had 1–5 years of work experience (65.0%) and provide outpatient pharmacy service (22.5%). Near to half (47.0%) of the respondents were not satisfied with their job. Only one among five of the participants feel that they are doing professional job which they enjoy and want to stay on their current working place. The least satisfaction score was obtained for staff adequacy (15.0%) and the highest satisfaction score was obtained for job relation of pharmacists with other health care professionals (74.0%).

#### Conclusion

In the current study near to half of the hospital pharmacists were poorly satisfied on their job. High workload, inadequate salary, low respect and treat from hospital management teams, uncomfortable working environment and insufficient promotion opportunities within the hospital were mentioned as the major reasons for their poor job satisfaction. Thus, policy makers, pharmacy directors and hospital administrators, should work to reduce workload, to increase incentives and to create good working environment to improve job satisfaction and the quality of pharmaceutical care in the hospital.

Menjetta, T. (2021). Assessment of Knowledge, Attitude, and Practice towards Prevention and Control of Malaria in Halaba Town, Southern Ethiopia, 2017. *Journal of Tropical Medicine*, 2021. Scopus. https://doi.org/10.1155/2021/5665000

#### Abstract

#### Background

Malaria is one of the primary public health problems in Ethiopia. Therefore, assessment of situation of the disease and communities' knowledge and perceptions about this disease is necessary to introduce appropriate preventive and control measures. Hence, this study was aimed to assess the knowledge, attitude, and practice towards malaria in Halaba town, SNNPR, Ethiopia.

#### Methods

A community-based cross-sectional study was conducted in Halaba town from June 2017 to September 2017. A multistage random sampling technique was used to select the study participants. A total of 421 were interviewed to assess their knowledge, attitude, and practice towards malaria. Results. About 280 (66.5%) respondents had ever heard of malaria. Most of the respondents (63.4%) attributed the cause of malaria to mosquito bites. However, some of the respondents (36.6%) mentioned contact with malaria patients, lack of personal hygiene, staying together, and transmission via breathing as the causes of malaria. Sleeping under mosquito nets, draining stagnant water, and indoor residual spraying were the most frequently mentioned malaria preventive measures perceived and practiced by the respondents.

#### Conclusions

A high level of knowledge about the cause, transmission, and preventive methods of malaria was detected among the community in Halaba town. However, a significant proportion had misconceptions about the cause and transmission of malaria suggesting the necessity of health education to raise the community's awareness about the disease.

Debela, S. A., Sheriff, I., Debela, E. A., Sesay, M. T., Tolcha, A., & Tengbe, M. S. (2021). Assessment of Perceptions and Cancer Risks of Workers at a Polychlorinated Biphenyl-Contaminated Hotspot in Ethiopia. *Journal of Health and Pollution*, *11*(30), 1–19. Scopus. https://doi.org/10.5696/2156-9614-11.30.210609

#### Abstract

#### Background

Polychlorinated biphenyls (PCBs) are synthetic and persistent toxic chemical with a high potential to bioaccumulate in human tissue. There is no existing literature on workers' perceptions and occupational cancer risk due to exposure to PCBs in Ethiopia. Objectives. The aim of the present study was to assess workers' perceptions of occupational health and safety measures of PCB management and to evaluate the cancer risk posed by PCBs to workers handling these chemicals in Ethiopia.

#### Methods

A total of 264 questionnaires were administered to workers at the study area to obtain information about PCB management. A mathematical model adopted from the Uni States Environmental Protection Agency (USEPA) was used to assess the potential cancer r of people working in PCB-contaminated areas.

#### Results

The results showed that the majority of the workers had little knowledge of safe PCB management practices. Furthermore, 82.6% had not received training on chemical management and occupational health and safety protocols. The association between respondents' responses on the impact of PCBs to the use of personal protective equipment was statistically significant (p <0.005). Accidental ingestion, dermal contact and inhalation exposure pathways were considered in assessing the cancer risk of people working in these areas. The estimated cancer risk for PCBs via dermal contact was higher than for the accidental ingestion and inhalation pathways. The health risk associated with dermal conta was 73.8-times higher than the inhalation exposure route. Workers at the oil tanker and oil barrel area and swampy site are at higher risk of cancer via dermal contact at the 95th centi (879 and 2316 workers per million due to PCB exposure, respectively). However, there is very low cancer risk at the staff residence and garden area via the inhalation route.

#### Conclusions

Training programs would help improve the knowledge of workers in the area occupational health and safety of chemical handling. Further studies on PCBs in the expos workers will provide information on their blood sera PCB levels and consequently identify potential health impacts. Participant Consent. Obtained Ethics Approval. Ethics approval was obtained from the Research Ethics Review Committe of Adama Hospital Medical College, Adama, Ethiopia. Competing Interests. The authors declare no competing financial interests.

Tewodros, A., Melese, L., & Yoseph, T. (2021). Assessment Of The Production And Importance Of Cowpea [Vigna Unguiculata (L.) Walp]: Cases From Selected Districts Of Southern Ethiopia. *African Journal of Food, Agriculture, Nutrition and Development*, 21(7), 18300–18318. Scopus. https://doi.org/10.18697/ajfand.102.19630

#### Abstract

Cowpea (Vigna unguiculata L.Walp) is an important legume in the hot, dry tropics and subtropics of sub-Saharan Africa, serving a multiple role for the livelihoods of millions of relatively lowincome people. The entire plant can be used for either human or livestock consumption and with considerable drought-tolerating capacity. Tender young leaves, green pods and matured seeds are used as human food. Moreover, the crop serves for sustainable soil fertility improvement due to its excellent nitrogenfixing capacity. However, its production and utilization are limited in Ethiopia partly due to dependence on the conventional agronomic practices and lack of information on its wide ranging uses. This study was conducted to assess the cowpea agronomy and the contributions the crop has in the livelihoods of farmers at Loka-Abaya and Humbo districts of Southern Ethiopia. Multi-stage sampling techniques were employed to achieve the set objectives. Both primary and secondary data were collected to solicit the required information. The data were subjected to descriptive and inferential statistics such as multiple linear regression model using the SPSS Software version 20 and STATA 13. Multiple linear regression model results showed that education, land size, climate information access, credit access, lack of market chain, availability of seed of improved varieties, and pests significantly (P<0.001) affected cowpea production in the studied areas. The trend analysis showed that the cowpea yield and production area coverage is increasing in Humbo District whereas, a decreasing trend was observed at the Loka Abaya.

According to the household interview data, about 76 % of the respondents reported a decrease in the cultivated area of cowpea. According to the respondents, lack of access to improved seed and lack of extension support services contributed 79 % and 73 %, respectively to the low yield observed in the area. The majority of the respondents cultivate cowpea as intercropping and rotation with cereals and in the main field with the main purpose to replenish soil fertility (97 %). On the other hand, 62 % of the respondents cultivate cowpea for home consumption. According to the survey result, 48 % of the respondents use the matured grain for consumption. The production trends of the cowpea are highly variable mainly due to less attention paid by the extension systems to boost the yield of the crop, reliance of farmers on local varieties, pest occurrence and poor market chain.

### Kayamo, S. E. (2021). Asymmetric impact of real exchange rate on inflation in Ethiopia: A non-linear ARDL approach. *Cogent Economics and Finance*, 9(1). Scopus. https://doi.org/10.1080/23322039.2021.1986931

#### Abstract

A surge in inflation for the last decade has been a top agenda of political and economic debate in Ethiopia. The monitory authority of the country has regularly devalued Ethiopian birr to stabilize the inflation and stimulate exports. Whether this has indeed stabilized inflation and increased export earnings is an issue of debate. This study investigates the asymmetric impact of real exchange rate on inflation for period 1982–2019. The non-linear ARDL bounds test is used to test the presence of long-run co-integrations. Long- and short-run estimations were done based on the non-linear ARDL error correction methodology. The result of the study indicated that the real exchange rate has asymmetric effects on inflation in short- and long-run. The imbalance in real exchange rate (depreciation and appreciation) causes a surge in inflation in the long-run. The policy implication of this study is that flexibility in exchange rate market should be planned to ensure price stability rather than following restrictive exchange rate policy.

Subussa, B. W., Eshetu, T., Degefa, T., & Ali, M. M. (2021). Asymptomatic Plasmodium infection and associated factors among pregnant women in the Merti district, Oromia, Ethiopia. *PLoS ONE*, *16*(3 March). Scopus. https://doi.org/10.1371/journal.pone.0248074

#### Abstract

#### Background

Asymptomatic Plasmodium infection (API) that occurs during pregnancy increases the risk of stillbirths, abortion, premature delivery, and low birth weight. API also hinders the control and prevention of malaria as infected hosts serve as silent reservoirs for transmission of Plasmodium species in the community.

#### Objective

The aim of this study was to determine the prevalence of API and associated factors among pregnant women. This community-based cross-sectional study was conducted at Merti district, Oromia, Ethiopia among 364 pregnant women from March to September 2018.

#### Methods

Sociodemographic and obstetrics features were collected using a structured questionnaire. About 2ml of blood was collected from participants to detect Plasmodium species, gametocyte carriage rate, parasite density, and anemia.

#### Results

The prevalence of API among pregnant women was 3.6%. The proportion of Plasmodium falciparum and Plasmodium vivax was 6(46.2%) and 7(53.8%) respectively. Out of 13 Plasmodium species identified, Gametocyte carriage rate was 4(30.7%). The geometric mean density of the asexual stage of the parasites was 994.7(interquartile [IQR], 320 to 2200) parasites/ ul. The geometric mean gametocyte density was 303.3 (interquartile range [IQR], 160 to 600). The proportion of anemia among Plasmodium-infected participants was 12 (92.3%). Previous infection by Plasmodium species (AOR = 5.42; 95% CI: 1.19-29.03, p = 0.047), lack of insecticide-treated bed net use (AOR = 6.52; 95% CI: 1.17-36.44, p = 0.032), and living close to stagnant water (AOR = 4.18; 95% CI (1.12-17.36, p = 0.049) were significantly associated with API. Anemia was significantly higher among Plasmodiuminfected than non-infected pregnant women (x2 = 27.62, p <0.001).

#### Conclusion

In the current study, a relatively high prevalence of API was detected among pregnant women. Identifying API in the community is important to prevent the unwanted outcomes of Plasmodium infection and its transmission.

Lemma, B., Ararso, K., & Evangelista, P. H. (2021). Attitude towards biogas technology, use and prospects for greenhouse gas emission reduction in southern Ethiopia. *Journal of Cleaner Production*, 283. Scopus. https://doi.org/10.1016/j.jclepro.2020.124608

#### Abstract

In developing countries, fuelwood extraction is one of the main drivers of deforestation, forest degradation, and greenhouse gas (GHG) emissions. This study aimed to investigate the use, management, and attitudes towards biogas technology in rural communities in Ethiopia and assess its' potential in reducing the consumption of biomass fuels and emissions of GHG. A questionnaire survey sampled from 40 biogas user and 40 non-user households was used to collect data. The biogas flow rate was measured using a gas flow meter from three random biogas digesters. Biogas and non-biogas user households reported similar socioeconomic perspectives. Our results showed that 92.5% of biogas user households and 77.5% of non-users had a positive attitude towards biogas technology, however, 52.5% of the non-users lacked information about the technology while 25% of the non-users were deterred by biogas installation costs. The average biogas consumption of each household was from 496 to 566 m3 yr-1 for cooking and from 106 to 124 m3 yr-1 for lighting. Biogas user households consumed fuelwood and crop residue to the same extent as non-user households for baking foods. However, biogas user households differed significantly from non-user households in biomass fuel use for non-baked foods owing to the suitability of biogas stoves. Each biogas user household reduced their fuelwood and charcoal use by about 2410 kg yr-1 and 379 kg yr-1, respectively, and decreased their kerosene use (for lighting) by about 9.5 L yr-1. The GHGs emitted by each household was estimated at 10,242 kg CO2e yr-1 and 16,266 kg CO2e yr-1 for biogas user and non-user households, respectively. Thus, each household with a biogas digester has the potential to reduce 6024 kg CO2e yr-1 of GHG emission. Biogas energy can offer an opportunity to mitigate GHGs emissions through reduced pressure on forests. Its' contribution can more than double by improving the biogas stove design to fit the traditional baked foods.

Tiwari, V., Bapat, K., Shrimali, K. R., Singh, S. K., Tiwari, B., Jain, S., & Sharma, H. K. (2021). *Automatic Generation of Chest X-Ray Medical Imaging Reports using LSTM-CNN*. 80–85. Scopus. https://doi.org/10.1145/3484824.3484918

#### Abstract

Generating medical reports manually is a difficult task, especially in rural areas and in urgent medical cases, where there is an emergency. It can also be error-prone for inexperienced physicians to generate a medical report. There are various deep learning methodologies such as Image captioning, image classification that has been implemented earlier to solve this problem. Generating a medical report automatically is a difficult task, considering the less amount of open-source data available and the paired data which contains medical Images and the report is also limited. One of the challenging tasks is data bias in medical Imaging. A generative encoder-decoder model is suggested to solve this problem in an efficient way. There are various other challenges. First, the medical report itself contains various heterogeneous information such as paragraphs, tags, keywords. Secondly, it is also difficult to identify the abnormal regions in medical images. To solve this problem, a multi-task framework is built, which can perform tag generation and paragraph generation. LSTM (Long Short Term Memory) is built to generate long heterogeneous paragraphs in the medical report. The model working is demonstrated on Chest X-Ray dataset and also on pathology dataset.

## Gebre, A. B., Begashaw, T. A., & Ormago, M. D. (2021). Bacterial profile and drug susceptibility among adult patients with community acquired lower respiratory tract infection at tertiary hospital, Southern Ethiopia. *BMC Infectious Diseases*, 21(1). Scopus. https://doi.org/10.1186/s12879-021-06151-2

#### Abstract

#### Background

Lower respiratory tract infection is a global problem accounting over 50 million deaths annually. Here, we determined the bacterial profile and antimicrobial susceptibility pattern of lower respiratory tract infections among adult patients attending at Tertiary Hospital, Southern Ethiopia.

#### Methods

A cross sectional study was conducted among adult patients with lower respiratory infection at the medical outpatient department of the Hospital. A sputum sample was collected and processed for bacterial culture and antimicrobial susceptibility test. Semi structured questionnaires were used to collect data. SPSS version 22 software was used for statistical analysis and a p value of < 0.05 was considered as statistically significant.

#### Results

Out of 406 sputum samples of participants 136(33.5%) were culture positive for 142 bacterial isolates. Klebsiella pneumoniae 36(25.4%) was the predominant isolate followed by Pseudomonas species 25(17.6%). Gram-negative bacteria were sensitive to cefepime (86.0%) and ciprofloxacin (77.8%) antibiotics while gram-positive (76.5%) to clindamycin.

#### Conclusion

Community acquired lower respiratory tract Infection was highly prevalent in the study area and the isolates showed resistant to common antibiotics such as ampicillin, augmentin, ceftazidime and tetracycline. Therefore, culture and susceptibility test is vital for appropriate management of lower respiratory tract infection in the study area.

Mechal, T., Hussen, S., & Desta, M. (2021). Bacterial profile, antibiotic susceptibility pattern and associated factors among patients attending adult OPD at Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia. *Infection and Drug Resistance*, 14, 99–110. Scopus. https://doi.org/10.2147/IDR.S287374

#### Abstract

#### Background

Urinary tract infection (UTI) is a common health problem occurring when infectious agents colonize, invade, and propagate the urinary tract including the urethra, bladder, renal pelvis, or renal parenchyma. The study aimed to determine the prevalence of symptomatic UTI, drug resistance pattern, and its associated factors among patients attending adult outpatient department (OPD) at Hawassa University Comprehensive Specialized Hospital (HUCSH).

#### Methods

A cross-sectional study was conducted from October 2018 to February 2019 among adults  $\geq$ 18 years old with symptoms of UTI. Processing of specimens for culture and identification was done. Antimicrobial susceptibility was done for positive urine cultures. Data entry and analysis were performed using SPSS version 23.0 software. Bivariate and multivariate logistic regression analysis test results were used.

#### Results

The overall prevalence of symptomatic urinary tract infection was 32.8% (95% CI: 28.3–37.6). The predominant isolated bacteria was E. coli 46 (36.2%) followed by S. aureus 21 (16.5%). Gramnegative bacteria were a high level of resistance to ampicillin (71.4%), and tetracycline (68.2%). Gram-positive bacteria were highly resistant to norfloxacin (77.7%). The overall prevalence of multi-drug resistant isolates was 102 (80.3%). Being female, no formal education, and self-medication history had more likely cause UTI.

#### Conclusion

Urinary tract infection (UTI) among adults was prevalent in the study area. Being female, educational status and self-medication history had a significant association with UTI. Resistance to ampicillin, tetracycline, and norfloxacin was high. Therefore, culture and antibiotic susceptibility testing should be routinely used for the proper management of patients with UTI.

Gebretsadik, A., Taddesse, F., Melaku, N., & Haji, Y. (2021). Balneotherapy for Musculoskeletal Pain Management of Hot Spring Water in Southern Ethiopia: Perceived Improvements. *Inquiry* (*United States*), 58. Scopus. https://doi.org/10.1177/00469580211049063

#### Abstract

#### Background

Balneotherapy and hydrotherapy offer interesting treatment alternatives and are commonly used as additional interventions in the management of musculoskeletal disorders and pain management. Therefore, the aim of this study was to assess the effect of balneotherapy on musculoskeletal disorder pain and its perceived improvement among users of hot spring water in Southern Ethiopia.

#### Methods

A single-arm cohort study and convenient sampling method were used to select 1337 study participants from four hot springs in Southern Ethiopia. A structured questionnaire, a physical examination, and laboratory blood tests were used to collect data. Data were entered using Epi data and transferred to SPSS 25 for cleaning and analysis. Descriptive analysis was made.

#### Results

A total of 1279 participants were included in the study, giving a response rate of 96%. The majority of these patients have multiple health problems. Of all, 1137 (88.9%) of the patients were visiting the hot springs for joint pain followed by muscle pain 669 (52.2). Out of all cases of joint pain, 132 (11.6%) were clinically diagnosed with rheumatoid arthritis, and 5.3% were confirmed as having the disease based on a laboratory test. Of the total number of study participants, 1064 (83.2%) reported complete relief from the complaints they had at the start of the bath.

#### Conclusions

Hot spring baths for three and more days have significant therapeutic effects on patients with musculoskeletal disorders, including rheumatoid arthritis. Physicians who are currently working in the area of diagnosis and treatment of patients in government and public facilities of the southern region should consider hot spring bath treatment for those patients with complaints of musculoskeletal pain, nonspecific arthritis, and rheumatoid arthritis. A hot spring bath is beneficial for everyone because it is a natural treatment with few side effects and a low cost.

Bilal, S. M., Tadele, H., Abebo, T. A., Tadesse, B. T., Muleta, M., W/Gebriel, F., Alemayehu, A., Haji, Y., Kassa, D. H., Astatkie, A., Asefa, A., Teshome, M., Kawza, A., Wangoro, S., Brune, T., Singhal, N., Worku, B., & Aziz, K. (2021). Barriers for kangaroo mother care (KMC) acceptance, and practices in southern Ethiopia: A model for scaling up uptake and adherence using qualitative study. *BMC Pregnancy and Childbirth*, *21*(1). Scopus. https://doi.org/10.1186/s12884-020-03409-6

#### Abstract

#### Background

Globally, approximately 15 million babies are born preterm every year. Complications of prematurity are the leading cause of under-five mortality. There is overwhelming evidence from low, middle, and high-income countries supporting kangaroo mother care (KMC) as an effective strategy to prevent mortality in both preterm and low birth weight (LBW) babies. However, implementation and scale-up of KMC remains a challenge, especially in lowincome countries such

as Ethiopia. This formative research study, part of a broader KMC implementation project in Southern Ethiopia, aimed to identify the barriers to KMC implementation and to devise a refined model to deliver KMC across the facility to community continuum.

#### Methods

A formative research study was conducted in Southern Ethiopia using a qualitative explorative approach that involved both health service providers and community members. Twenty-fourin-depth interviews and 14 focus group discussions were carried out with 144study participants. The study applied a grounded theory approach to identify, examine, analyse and extract emerging themes, and subsequently develop a model for KMC implementation.

#### Results

Barriers to KMC practice included gaps in KMC knowledge, attitude and practices among parents of preterm and LBW babies;socioeconomic, cultural and structural factors; thecommunity's beliefs and valueswith respect to preterm and LBW babies;health professionals' acceptance of KMC as well as their motivation to implement practices; and shortage of supplies in health facilities. Conclusions: Our study suggests a comprehensive approach with systematic interventions and support at maternal, family, community, facility and health care provider levels. We propose an implementation model that addresses this community to facility continuum.

Chikako, T. U., Seidu, A.-A., Hagan, J. E., Aboagye, R. G., & Ahinkorah, B. O. (2021). Bayesian analysis of predictors of incomplete vaccination against polio among children aged 12–23 months in ethiopia. *International Journal of Environmental Research and Public Health*, 18(22). Scopus. https://doi.org/10.3390/ijerph182211820

#### Abstract

#### Background

The re-introduction of polio among children aged 12–23 months is likely to occur in Ethiopia due to the low vaccination rates against poliovirus. The study sought to examine the predictors of incomplete vaccination against polio among children aged 12–23 months in Ethiopia.

#### Methods

The data used were obtained from the 2016 Ethiopia Demographic and Health Survey. Binary and Bayesian logistic regressions were used for the data analysis, with parameters estimated using classical maximum likelihood and the Bayesian estimation method.

#### Results

The results revealed that 43.7% of the children were not fully vaccinated against polio in Ethiopia. Maternal age, educational level, household wealth index, exposure to mass media, place of residence, presence of nearby healthy facility, counseling on vaccination, and place of delivery were significant determinants of incomplete polio vaccination among children aged between 12 and 23 months in Ethiopia.

#### Conclusion

Considerable numbers of children are not fully vaccinated against polio in Ethiopia. Individual and contextual factors significantly contributed to incomplete polio vaccination among children in the country. Therefore, the government and other stakeholders should pay particular attention to maternal education to increase mothers' educational level in all regions and give training and counseling in all urban and rural parts of the country on child vaccination to overcome the problem of children's incomplete polio vaccination and/or vaccination dropout.

### Delena, M. F., & Kayamo, S. E. (2021). Beekeeping opportunities, challenges and technology adoption in Gedeo Zone, Southern Ethiopia. *Journal of Apicultural Research*. Scopus. https://doi.org/10.1080/00218839.2021.1961429

#### Abstract

Ethiopia has enormous potential for beekeeping. However, its potential has been underutilized due to the traditional way of beekeeping practice. This study was conducted in the Gedeo zone with the main objectives of assessing opportunities, challenges and the adoption of beekeeping technology. Sample districts were purposely selected based on beekeeping potential and the number of improved hives owned by beekeepers. Data was collected from 180 beekeepers using a cross-sectional survey. The data was analyzed using descriptive statistics and logistic regression analysis. Education level, access to beekeeping training, beekeeping experience, access to beekeeping equipment, gender and annual income significantly affected the adoption of improved beehives. Therefore, to exploit the existing beekeeping opportunities, raising awareness through intensive training on improved beekeeping technology would be a crucial measure to increase the adoption of beekeeping technology. In addition, offering affordable improved beehives.

Dessie, Y., Tadesse, S., Eswaramoorthy, R., & Abdisa, E. (2021). Bimetallic Mn–Ni oxide nanoparticles: Green synthesis, optimization and its low-cost anode modifier catalyst in microbial fuel cell. *Nano-Structures and Nano-Objects*, 25. Scopus. https://doi.org/10.1016/j.nanoso.2020.100663

#### Abstract

Green synthesis of α-MnO2/NiO bimetallic nanocatalyst was achieved in the presence of Vernonia amygdalina leaf extract. The biosynthesized material was optimized by I-optimal Coordinate Exchange Design model by setting 3-operational factors under 9 experimental run. The optimum conditions were 51% nickel ion concentration, 25.3 min reaction time, and 75.3% (v/v) extract ratio to obtain a maximal absorption edge of 376.8 nm (Eg=3.29eV) for a stable particle size estimation. The regression (R2=0.9873) and adjusted (R2=0.9494) coefficients as well as adequacy of precision (16.8772) proved the good correlation between actual and predicted values. Optical spectroscopies (UV-Vis and FTIR), XRD, DSC, SEM, surface roughness, CV, and EIS were performed to characterize the biosynthesized bimetallic nanocatalyst. Oxidation peak current response using bimetallic nanoparticles (NPs) modified electrode was 2.522 mA, which was higher than α-MnO2 (2.442 mA), NiO (1.897 mA), and bare pencil graphite (0.735 mA) electrodes. The corresponding conductivity of  $\alpha$ -MnO2/NiO was higher with low solution resistance (10.84  $\Omega$ ) than other catalysts. As a result, the biosynthesized bimetallic modified pencil graphite electrode produces  $412.24 \pm 5.98$  mW m-2maximum power density than bare pencil graphite ( $65.74 \pm 0.96$ mW m–2),  $\alpha$ -MnO2 (315.62 ± 4.87 mW m–2), and NiO (140.35 ± 1.68 mW m–2) in the doubled chambered MFC. The results showed that the fabricated bimetallic NPs have an effective and value add role to modify conventional carbon anode electrodes in the MFCs energy conversion device system.

Eba, K., Duchateau, L., Olkeba, B. K., Boets, P., Bedada, D., Goethals, P. L. M., Mereta, S. T., & Yewhalaw, D. (2021). Bio-control of anopheles mosquito larvae using invertebrate predators to support human health programs in Ethiopia. *International Journal of Environmental Research and Public Health*, 18(4), 1–10. Scopus. https://doi.org/10.3390/ijerph18041810

#### Abstract

Mosquitoes have been a nuisance and health threat to humans for centuries due to their ability to transmit different infectious diseases. Biological control methods have emerged as an alternative or complementary approach to contain vector populations in light of the current spread of insecticide resistance in mosquitoes. Thus, this study aimed to evaluate the predation efficacy of selected potential predators against Anopheles mosquito larvae. Potential invertebrate predators and Anopheles larvae were collected from natural habitats, mainly (temporary) wetlands and ponds in southwest Ethiopia and experiments were conducted under laboratory conditions. Optimal predation conditions with respect to larval instar, water volume and number of predators were determined for each of the seven studied predators. Data analyses were carried out using the Poisson regression model using one way ANOVA at the 5% significant level. The backswimmer (Notonectidae) was the most aggressive predator on Anopheles mosquito larvae with a daily mean predation of 71.5 larvae (95% CI: [65.04;78.59]). Our study shows that larval instar, water volume and number of predators have a significant effect on each predator, except for dragonflies (Libellulidae), with regard to the preference of the larval instar. A selection of mosquito predators has the potential to control Anopheles mosquito larvae, suggesting that they can be used as complementary approach in an integrated malaria vector control strategy

## Masresha, A. E., Skipperud, L., Rosseland, B. O., G.M, Z., Meland, S., & Salbu, B. (2021). Bioaccumulation of trace elements in liver and kidney of fish species from three freshwater lakes in the Ethiopian Rift Valley. *Environmental Monitoring and Assessment*, 193(6). Scopus. https://doi.org/10.1007/s10661-021-09083-1

#### Abstract

The objective of the present work was to obtain scientific information on the ecological health of three freshwater lakes (Awassa, Koka, and Ziway) situated in the Ethiopian Rift Valley by investigating possible trace element contamination accumulated in fish. Accordingly, fish liver

and kidney samples were collected from three commercially important fish species (Barbus intermedius, Clarias gariepinus, and Oreochromis niloticus) in the lakes to determine the concentrations of chromium (Cr), manganese (Mn), cobalt (Co), nickel (Ni), copper (Cu), zinc (Zn), arsenic (As), selenium (Se), cadmium (Cd), and lead (Pb), using ICP-MS. Trace element concentrations were generally higher in O. niloticus compared with concentrations in B. intermedius and C. gariepinus. Compared to background values of most freshwater fish species, higher liver concentrations of Cu in C. gariepinus and O. niloticus, Mn in O. niloticus, Co in all except B. intermedius, and Zn in C. gariepinus from Lakes Ziway and Awassa were found. Cr, Co, Ni, Cd, and Pb were enriched in kidney, while Mn, Cu, Zn, As, and Se seems retained in the liver tissues. Assessment of transfer factors indicated that bioaccumulation from water and diet occurred, while uptake from sediments was low. Furthermore, the transfer factor values were generally higher for essential elements compared to the non-essential elements. Multivariate statistical analyses showed that the differences between the trace element levels were generally not significant among the lakes (p = 0.672), while significant differences were found between the fish species (p = 0.042), and between accumulation in kidney and liver (p = 0.002).

## Tole, T. T., Diriba, E., & Bahiru, L. A. (2021). Bioactive compounds from Croton macrostachyus and Commiphora habessinica occurring in Ethiopia. *Advances in Traditional Medicine*. Scopus. https://doi.org/10.1007/s13596-021-00570-x

#### Abstract

Croton macrostachyus is traditionally used in Ethiopia for treating diabetes, cancers, digestive problems, dysentery, wounds, fevers, constipation, diarrhea, intestinal worms, malaria, pain ulcers, and inflammation. The aim of the present work is investigating the chemical constituents of C. macrostachyus and Commiphora habessinica. The powdered stem bark of C. macrostachyus was successively extracted with n-hexane, chloroform and methanol yielding 1.2, 0.72 and 6.04% respectively. Phytochemical screenings of the extracts revealed the presence of flavonoids, tannins, saponins, phenols, terpenoids, glycosides, steroids and absence of anthraquinones. The methanol extract of C. macrostachyus subjected to chromatographic separation resulted in the antimalarial, antiprotozoal, antimicrobial, anti-inflammatory, antitumor and chemopreventive component lupeol (SED-1). The isolated compound was characterized using melting point, NMR and IR spectroscopy and by comparing experimentally obtained spectral data with previously

reported literature. The essential oil of the resin from C. habessinica was isolated by hydrodistillation and a total of 21 components were identified by means of GC and GC/MS analysis. The main components of the essential oil were the medicinally important components  $\alpha$ -copaene (27%),  $\alpha$ -cadinol (25%), and trans-caryophyllene (15.3%). Graphical abstract: [Figure not available: see fulltext.]

Ewunie, G. A., Yigezu, Z. D., & Morken, J. (2021). Biochemical methane potential of Jatropha curcas fruit shell: Comparative effect of mechanical, steam explosion and alkaline pretreatments. *Biomass Conversion and Biorefinery*. Scopus. https://doi.org/10.1007/s13399-020-01159-1

#### Abstract

Jatropha curcas is a promising tropical and subtropical plant species for biodiesel production that can reduce the competition between food and energy production. Jatropha seed processing for oil extraction usually generates considerable amount of Jatropha curcas fruit shell (JCFS), which can be considered as a potential substrate for biogas production rather than being discarded as solid waste. However, the higher lignocellulosic constituents in JCFS potentially affect the biological degradation process. Thus, applying suitable pretreatment techniques in advance of anaerobic digestion could enhance the biodegradability and methane yield of JCFS. In this study, the effect of mechanical, steam explosion (SE), and alkaline pretreatments on the chemical composition and methane yield of JCFS was examined at various process conditions. As compared with the untreated sample, grinding the JCFS into a particle size of less than 1 mm increased the methane yield by 74.23%, while at the optimum SE pretreatment process (160 °C, 5 min), the methane yield was increased by 54.75%. The alkaline pretreatment was relatively less effective over the other pretreatments; 44.05% methane yield increment was achieved after soaking the JCFS with 7.32% NaOH at 36 °C for 54 h. The effect of SE on compositional change depends on the severity factor in which severe pretreatment conditions were adequate for solubilizing the hemicellulose but resulted in higher pseudo-lignin and lower methane yields. In conclusion, all pretreatments processes have significantly increased the methane yield of JCFS as compared to the untreated JCFS; however, mechanical pretreatment was more effective than SE and alkaline pretreatments.

Gebremariam, S. N., & Marchetti, J. M. (2021a). Biodiesel production process using solid acid catalyst: Influence of market variables on the process's economic feasibility. *Biofuels, Bioproducts and Biorefining*, 15(3), 815–824. Scopus. https://doi.org/10.1002/bbb.2203

#### Abstract

There are a number of efficient alternative technologies for the production of fuel-quality biodiesel from various feedstock types. The solid acid catalyzed transesterification process is one such approach. In this study, the whole process of biodiesel fuel production using solid acid catalysts has been simulated using commercially known software – SuperPro Designer – and the effects of some selected market variables on the economic feasibility of the whole process have been investigated. The market variables considered are oil cost, biodiesel price, alcohol cost, catalyst cost, labor cost, tax variation, maintenance cost, and glycerol selling price. Net present value and project payback time have been used as the parameters for evaluating the effect of changes in these market variables on the economic feasibility of the process, whereas changes in labor cost and equipment maintenance cost could show less effect.

#### Dessie, Y., Tadesse, S., Eswaramoorthy, R., & Adimasu, Y. (2021). Biosynthesized α-MnO2based polyaniline binary composite as efficient bioanode catalyst for high-performance microbial fuel cell. *All Life*, *14*(1), 541–568. Scopus. https://doi.org/10.1080/26895293.2021.1934123

#### Abstract

Microbial fuel cell (MFC) has novel technological advances in simultaneous power generation and wastewater treatment applications. In this study, low-cost biosynthesized  $\alpha$ -MnO2 nanoparticles integration with conducting polyaniline (PANI) matrix to form  $\alpha$ -MnO2/PANI hybrid nanocomposite was fabricated by in situ polymerization method. The prepared material was characterized through UV-Vis spectroscopy, XRD, FTIR, TGA-DTA, DSC, SEM, cyclic voltammetry, and impedance spectroscopy. MFC performance study was done by using an external resistance in the range of 100  $\Omega$ -100 k $\Omega$ . The continuous test on bare pencil graphite electrode (PGE),  $\alpha$ -MnO2/PGE, PANI/PGE, and  $\alpha$ -MnO2/PANI/PGE were evaluated in glucose-

fed-Escherichia coli-based MFC. It was found that  $\alpha$ -MnO2/PANI/PGE produces a maximum power and current densities of 426.26 ± 38.89 mW m-2 and 2485.51 ± 397.31 mA m-2, respectively. This was 6.5 and 5.7-fold higher in power and current densities than unmodified PGE. The maximum chemical oxygen demand produced by hybrid composite modified anode during closed circuit voltage or with external resistance and open circuit voltage (OCV) (circuit without connecting external resistance) measurements were found to be 88.19% and 92.27%, respectively. A maximum of 650.61 ± 10.11 mV OCV was obtained by  $\alpha$ -MnO2/PANI/PGE while 222.36 ± 8.16 mV of OCV was generated by PGE.

Debelie, T. Z., Abdo, A. A., Anteneh, K. T., Limenih, M. A., Asaye, M. M., Aynalem, G. L., Ambaw, W. M., Kassie, B. A., & Abebe, S. M. (2021). Birth preparedness and complication readiness practice and associated factors among pregnant women in Northwest Ethiopia: 2018. *PLoS ONE*, *16*(4 April). Scopus. https://doi.org/10.1371/journal.pone.0249083

#### Abstract

#### Background

Birth-preparedness and complication readiness is a comprehensive strategy aimed at promoting the timely utilization of skilled maternal and neonatal health care. Pregnancy-related complications both on the mother and the newborn could be largely alleviated if there is a well-consolidated birth preparedness and complication readiness plan developed during pregnancy and implemented at the time of delivery.

#### Objective

To determine the prevalence of birth preparedness and complication readiness practice (BPCR) and associated factors among pregnant women in North Gondar Zone, Northwest Ethiopia, 2018.

#### Methods

A community based cross-sectional study was conducted among pregnant women in North Gondar Zone from March 2017 to February 2018. A multistage clustered sampling technique was used to enroll a total of 1620 participants. The data were collected by face to face interviews using pretested and semi-structured questionnaires at baseline and following delivery. The data were entered using EPI-data version 3.1 and analyzed using STATA version 14 software. Bivariate and multivariable logistic regression model was fitted to assess factors with BPCR practice. Adjusted

odds ratio (AOR) with 95% confidence interval was used to determine the association between covariates and the outcome variable.

#### Results

From a total of 1620 pregnant women only 1523 (94.0%) mothers were followed at the end line. The prevalence of BPCR plan during pregnancy was 66.1% [95% CI: 63.8, 68.5] and the practice at the time of delivery was 73.5% [95% CI 71.3, 75.7]. Of the total respondents who mentioned having a BPCR plan, 76.4% practiced at the time of delivery. Frequency of ANC visits [AOR = 1.97; 95% CI: 1.67, 2.32], larger number of family in the household [AOR = 1.14; 95% CI: 1.00, 1.30], highest wealth asset [AOR = 1.87; 95% CI: 1.16, 3.01], Multigravidity [AOR = 0.30; 95% CI: 0.15, 0.62], husband involvement in decision making [AOR = 2.2; 95% CI: 1.25, 3.82], counseled on BPCR [AOR = 2.35; 95% CI: 1.51, 3.68], were found to be significantly associated with BPCR practice.

#### Conclusion

BPCR practice at the time of delivery was higher than previous studies conducted in the country. However, BPCR practice was found to be lower than the standard that every woman should practice the plan at the time of delivery. Intersectoral collaborative interventions required to improve the economic status and living standard of families in the community as well as various awareness creation strategies should be implemented to support women to attend ANC follow-up visits.

Nigussie Yirgu, A., Mohammed, K. H., Diriba, S. D., Babso, A. K., & Abdo, A. A. (2021). Blood donation and associated factors among employees working at negele arsi general hospital and medical college, southeast ethiopia: A cross-sectional study. *Journal of Blood Medicine*, 12, 475–482. Scopus. https://doi.org/10.2147/JBM.S301826

#### Abstract

#### Background

Blood is a specialized body fluid in humans. Securing voluntary, nonpaid blood donation is an important national goal to prevent blood shortages. The donated blood plays a big role during surgery, accidents, delivery, bleeding cases, and the like. Currently, in many developing and developed countries, the blood supply is critically insufficient. Hence, the aim of this study was to

assess the practice of blood donation and associated factors among employees (clinical and nonclinical) at Negele Arsi General Hospital and Medical College.

#### Methods

A facility-based cross-sectional study was conducted from August 1 to 20, 2020. Self-administered and interview-administered questionnaires were used to collect the data. A stratified sampling method was employed to select 122 participants. Data were entered into EpiData 3.1 software and the analysis was done using SPSS version 25. Bivariable and multivariable binary logistic regression analysis with 95%CI was carried out.

#### Results

Among 122 employees who participated in the study, 39% have ever donated blood. Clinical staff were eight times more likely to donate blood compared to nonclinical staff (AOR=7.81, 95%CI: 2.15-28.39). Those who had one to five years work experience were 85% (AOR=0.15, 95% CI:0.03-0.74) less likely to donate blood compared to > 11 years of work experience. Those with inadequate knowledge were 71.0% (AOR=0.29, 95%CI: 0.09-0.89) less likely to donate blood compared to those with adequate knowledge. Those with an unfavorable attitude were 68.0% (AOR=0.32, 95%CI: 0.11-0.92) less likely to donate blood compared to those with a favorable attitude.

#### Conclusion

Generally, blood donation practice was low in the study area. The professional category, work experience, knowledge, and attitude were significantly associated with the practice of blood donation. Therefore, a blood donation campaign should be prepared to strengthen the practice.

Mekuria, S., Ashenafi, H., Kebede, N., Kassa, T., B Debella, D., Eyasu, T., Sheferaw, D., & Terefe, G. (2021). Bovine trypanosomosis in upstream and downstream of Ghibe-III hydroelectric dam: Parasitological and entomological study, southern Ethiopia. *Veterinary Parasitology: Regional Studies and Reports, 23.* Scopus. https://doi.org/10.1016/j.vprsr.2020.100507

#### Abstract

Two-point cross-sectional study design in dry and rainy seasons was employed near Ghibe-III Dam from December 2018 to July 2019. Trypanosomosis prevalence comparison between downstream (Kindodidaye) and upstream (Loma districts), associated risk factors, vector

dispersion, identification and vector infection rate considered. Blood sample collected from 1280 cattle from two districts during dry and rainy seasons; the assumed risk factors recorded. Samples were examined using heamatological and parasitological techniques. In this study 9.1% (116/1280) trypanosomosis prevalence recorded. Prevalence was significantly (p < 0.05) different between Kindodidaye (11.7%) and Loma (6.4%). Most of the infections were due to T. congolense (79.3%) followed by T. vivax (17.2%) and T. brucei (2.6%) and one mixed infection recorded. Significant (p < 0.05) difference observed in season, within district and between districts. Among the assumed risk factors: district, season, Kebele and body condition score showed significant (p < 0.05) difference; whereas sex, age, color weren't significantly (p > 0.05) different. Significantly (p < 0.05) low mean PCV observed in infected group, dry season and Kindodidaye district. Entomological survey revealed 1030 tsetse spp. (G. pallidipes and G. fuscipes) and 2045 biting flies mainly Stomoxysis and Tabanus, and other unidentified spp. recorded. Tsetse apparent density were significantly (p < 0.05) high in Kindodidaye and rainy season with value of 5.3 and 7.1 F/T/D, respectively. Out of 182 tsetse fly dissected twenty seven (14.6%) of them were infected. A proportion of 23.0%, 30.8% and 46.2% infection rate recorded in proboscis, salivary gland and mid gut, respectively. The study shows Kindodidaye and rainy season had high trypanosomosis and tsetse apparent density than Loma. The difference might be associated with water reserve created due to Ghibe III hydroelectric dam and this could be a golden opportunity in the area to contribute tsetse control program. Stakeholders' need to aware to use this opportunity before tsetse adapts itself into new environment or niche for their survival.

### Belete, M. D., Hebart-Coleman, D., Mathews, R. E., & Zazu, C. (2021). Building foundations for source-to-sea management: The case of sediment management in the Lake Hawassa subbasin of the Ethiopian Rift Valley. *Water International*, *46*(2), 138–156. Scopus. https://doi.org/10.1080/02508060.2021.1889868

#### Abstract

This article discusses experiences of applying the source-to-sea approach, contextualized to source-to-lake, in the Lake Hawassa sub-basin of the Ethiopian Rift Valley, particularly for the purpose of generating in-depth knowledge on sediment flows, building a geographically relevant comprehensive stakeholder and governance analysis and using this to design impactful interventions that can reduce sediment flux into Lake Hawassa. The source-to-sea approach has

proven to be a useful and flexible for evaluating sediment management in the context of a subbasin such as that of Lake Hawassa.

Muleta, A., Hailu, D., Stoecker, B. J., & Belachew, T. (2021). Camel milk consumption is associated with less childhood stunting and underweight than bovine milk in rural pastoral districts of Somali, Ethiopia: A cross-sectional study. *Journal of Nutritional Science*, 10, 1–8. Scopus. https://doi.org/10.1017/jns.2021.75

#### Abstract

Undernutrition is a major global health problem. Various types of animal milk are used for feeding children at early ages; however, associations of camel milk (CaM) and bovine milk (BM) with the nutritional status of children have not been explored. A comparative community-based crosssectional study was conducted among pre-schoolers in rural pastoral districts of Somali, Ethiopia. Children were selected from households with lactating camels or cows. Anthropometric measurements followed standard procedures for height-for-age, weight-for-age and weight-forheight scores. Independent sample t-tests identified significant differences in anthropometric indices based on the type of milk consumed. Multivariable logistic regression was used to examine associations between milk consumption and other predictors of growth failures. The prevalence of stunting was 24.1 % [95 % confidence interval (CI) 20.5, 28.3] of pre-schoolers, 34.8 % (95 % CI 29.9, 39.6) were wasted and 34.7 % (95 % CI 30.1, 39.9) were underweight. Higher proportions of BM-fed children were severely stunted, wasted and underweight compared with CaM consumers. Using logistic regression models, children who consumed BM [adjusted odds ratio (AOR): 2.10; 95 % CI 1.22, 3.61] and who were anaemic (AOR: 4.22; 95 % CI 2.23, 7.98) were more likely to be stunted than their counterparts, while girls were less likely to be stunted than boys (AOR: 0.57; 95 % CI 0.34, 0.94). Similarly, children who consumed BM (AOR: 1.97; 95 % CI 1.20, 3.24), who were anaemic (AOR: 2.27; 95 % CI 1.38, 3.72) and who drank unsafe water (AOR: 1.91; 95 % CI 1.19, 3.07) were more likely to be underweight than their counterparts. In conclusion, CaM consumption was associated with lower prevalence of stunting and underweight than BM. Promoting CaM in pastoralist areas may help to curb the high level of undernutrition.

Muleta, A., Hailu, D., & Belachew, T. (2021). Camel milk consumption was associated with lower prevalence of anemia among preschool children in rural pastoral districts of Somali, eastern Ethiopia. *Nutrition*, *86*. Scopus. https://doi.org/10.1016/j.nut.2021.111170

#### Abstract

#### Objective

The aim of this study was to investigate association between consumption of camel milk (CaM) and childhood anemia.

#### Methods

A community-based cross-sectional study was conducted with 388 preschool children (24–59 mo of age) in rural pastoral districts of Somali, eastern Ethiopia. We sampled 185 consumers of CaM and 203 who consumed bovine milk (BM). Children were selected from random households with lactating camels or cattle. Hemoglobin (Hb) was measured in the field using a HemoCue instrument. A multivariable logistic regressions model was used in SPSS version 20 to examine association between type of milk consumption and anemia.

#### Results

Anemia (Hb <11 g/dL) was found in 59.8% of the overall sample, whereas it was 42.7% and 75.4% among CaM and BM consumers, respectively. The odds of anemia among BM consumers (adjusted odds ratio [aOR], 3.12; 95% confidence interval [CI], 1.27–7.66) and children with intestinal parasites (aOR: 3.32; 95% CI, 1.39–7.91) was compared with CaM consumers and children without intestinal parasites, respectively. Increasing age and height-for-age z-score of children were associated with decreased childhood anemia (P < 0.001). Children with anemia consumed a higher volume of BM compared with non-anemic and CaM consumers, too but the consumption was not statistically significant.

#### Conclusion

CaM consumption was associated with lower prevalence of anemia compared with consumption of BM. Promoting use of CaM as complementary food for preschool children in pastoralist areas might be considered an intervention toward reducing anemia. Abdelaal, N. E., Tanga, B. M., Abdelgawad, M., Allam, S., Fathi, M., Saadeldin, I. M., Bang, S., & Cho, J. (2021). Cellular therapy via spermatogonial stem cells for treating impaired spermatogenesis, non-obstructive azoospermia. *Cells*, 10(7). Scopus. https://doi.org/10.3390/cells10071779

#### Abstract

Male infertility is a major health problem affecting about 8-12% of couples worldwide. Spermatogenesis starts in the early fetus and completes after puberty, passing through different stages. Male infertility can result from primary or congenital, acquired, or idiopathic causes. The absence of sperm in semen, or azoospermia, results from non-obstructive causes (pretesticular and testicular), and post-testicular obstructive causes. Several medications such as antihypertensive drugs, antidepressants, chemotherapy, and radiotherapy could lead to impaired spermatogenesis and lead to a non-obstructive azoospermia. Spermatogonial stem cells (SSCs) are the basis for spermatogenesis and fertility in men. SSCs are characterized by their capacity to maintain the selfrenewal process and differentiation into spermatozoa throughout the male reproductive life and transmit genetic information to the next generation. SSCs originate from gonocytes in the postnatal testis, which originate from long-lived primordial germ cells during embryonic development. The treatment of infertility in males has a poor prognosis. However, SSCs are viewed as a promising alternative for the regeneration of the impaired or damaged spermatogenesis. SSC transplantation is a promising technique for male infertility treatment and restoration of spermatogenesis in the case of degenerative diseases such as cancer, radiotherapy, and chemotherapy. The process involves isolation of SSCs and cryopreservation from a testicular biopsy before starting cancer treatment, followed by intra-testicular stem cell transplantation. In general, treatment for male infertility, even with SSC transplantation, still has several obstacles. The efficiency of cryopreservation, exclusion of malignant cells contamination in cancer patients, and socio-cultural attitudes remain major challenges to the wider application of SSCs as alternatives. Furthermore, there are limitations in experience and knowledge regarding cryopreservation of SSCs. However, the level of infrastructure or availability of regulatory approval to process and preserve testicular tissue makes them tangible and accurate therapy options for male infertility caused by nonobstructive azoospermia, though in their infancy, at least to date.

Kim, D.-G., Grieco, E., Bombelli, A., Hickman, J. E., & Sanz-Cobena, A. (2021). Challenges and opportunities for enhancing food security and greenhouse gas mitigation in smallholder farming in sub-Saharan Africa. A review. *Food Security*, *13*(2), 457–476. Scopus. https://doi.org/10.1007/s12571-021-01149-9

#### Abstract

Smallholder farmers struggle to achieve food security in many countries of sub-Saharan Africa (SSA). It is urgently required to find appropriate practices for enhancing crop production while avoiding large increases in greenhouse gas (GHG) emissions in SSA. This review aims to identify common smallholder farming practices for enhancing crop production, to assess how these affect GHG emissions and to identify strategies that not only enhance crop production but also mitigate GHG emissions in SSA. To increase crop production and ensure food security, smallholder farmers usually expand agricultural land, develop water harvesting and irrigation techniques and increase cropping intensity and fertilizer use. These practices may result in changing carbon stocks and GHG emissions, potentially creating trade-offs between food security and GHG mitigation. Agricultural land expansion at the expense of forests is the most dominant source of GHG emissions in SSA. While water harvesting and irrigation can increase soil organic carbon, they can trigger GHG emissions. Increasing cropping intensity can enhance the decomposition of soil organic matter, thus releasing carbon dioxide. Increasing nitrogen fertilizer use can enhance soil organic carbon, but also leads to increasing nitrous oxide emissions. An integrated land, water and nutrient management strategy is necessary to enhance crop production and mitigate GHG emissions. Among the most relevant strategies found, agroforesty practices in degraded and marginal lands could replace expanding agricultural croplands. In addition, water management, via adequate rainwater harvesting and irrigation techniques, together with appropriate nutrient management should be considered. Therefore, a land-water-nutrient nexus (LWNN) approach will enable an integrated and sustainable solution to increasing crop production and mitigating GHG emissions. Various technical, economic and policy barriers hinder implementing the LWNN approach on the ground, but these may be overcome through developing appropriate technologies, disseminating them through farmer to farmer approaches and developing specific policies to address smallholder land tenure issues and motivate long-term investment.
Zerssa, G., Feyssa, D., Kim, D.-G., & Eichler-Löbermann, B. (2021). Challenges of smallholder farming in Ethiopia and opportunities by adopting climate-smart agriculture. *Agriculture (Switzerland)*, 11(3), 1–26. Scopus. https://doi.org/10.3390/agriculture11030192

#### Abstract

Agriculture is the backbone of the Ethiopian economy, and the agricultural sector is dominated by smallholder farming systems. The farming systems are facing constraints such as small land size, lack of resources, and increasing degradation of soil quality that hamper sustainable crop production and food security. The effects of climate change (e.g., frequent occurrence of extreme weather events) exacerbate these problems. Applying appropriate technologies like climate- smart agriculture (CSA) can help to resolve the constraints of smallholder farming systems. This paper provides a comprehensive overview regarding opportunities and challenges of traditional and newly developed CSA practices in Ethiopia, such as integrated soil fertility management, water harvesting, and agroforestry. These practices are commonly related to drought resilience, stability of crop yields, carbon sequestration, greenhouse gas mitigation, and higher household income. However, the adoption of the practices by smallholder farmers is often limited, mainly due to shortage of cropland, land tenure issues, lack of adequate knowledge about CSA, slow return on investments, and insufficient policy and implementation schemes. It is suggested that additional measures be developed and made available to help CSA practices become more prevalent in smallholder farming systems. The measures should include the utilization of degraded and marginal lands, improvement of the soil organic matter management, provision of capacitybuilding opportunities and financial support, as well as the development of specific policies for smallholder farming.

# Chulo, F., Laekemariam, F., & Kiflu, A. (2021). Changes in Soil Phosphorus Pools and Chemical Properties under Liming in Nitisols of Farawocha, South Ethiopia. *Applied and Environmental Soil Science*, 2021. Scopus. https://doi.org/10.1155/2021/5518545

## Abstract

Understanding the nutrient dynamics in acid soil is fundamental to carry out proper management. The study was conducted to investigate phosphorus (P) pools and selected properties under different rates of lime for acid nitisols of Farawocha, Southern Ethiopia. Four lime rates incubated for a month in three replications were tested. The lime rates were 0 t/ha (0%), 5.25 t/ha (50%), 10.5 t/ha (100%), and 15.75 t/ha (150%). Lime requirement (LR) for 100% was calculated targeting soil pH of 6.5. Data on the P pools such as soluble P (P-sol) and bounded forms of P with iron (Fe-P), aluminum (Al-P), calcium (Ca-P), organic part (Org-P), residual P (Res-P), and total of P fractions were measured. In addition, changes in soil chemical properties such as pH, exchangeable acidity, calcium (Ca), magnesium (Mg), sulfur (S), iron (Fe), copper (Cu), boron (B), zinc (Zn), and manganese (Mn) were analyzed. The result showed that total P was 357.5 mg/kg. Compared to nontreated soil, liming at a rate of 15.75 t/ha significantly improved P-sol (34.2%, r2 = 0.88), Ca-P (61.6%, r2 = 0.92), and Res-P (195%, r2 = 0.94); however, it reduced Fe-P (58.5%, r2 =-0.83), Al-P (71%, r2 =-0.97), and Org-P (19.1%, r2 = 0.93). Overall, the P-Associated fractions in the soil, regardless of the lime rates, were in the order of Org P > Res P> Fe\_P > Ca\_P > Al\_P > P-sol. Liming raised soil pH by 2.1 units (4.5 to 6.6) over nonlimed soil, whereas it reduced exchangeable acidity from 4.18 to 0.23 meq/100 g soil. Available P, Ca, Mg, S, Cu, Zn, and B contents were significantly improved with lime application. However, liming reduced Fe and Mn contents. In conclusion, these findings showed that liming facilitated the release of P from various pools, modified pH and exchangeable acidity, and resulted in beneficial changes for most of the soil chemical properties.

# Wegi, T., Hassen, A., Bezabih, M., & Tolera, A. (2021). Changes in vegetation structure, aboveground biomass and soil quality in response to traditional grazing land management practices in the central highlands of Ethiopia. *African Journal of Range and Forage Science*, 38(S1), S52–S62. Scopus. https://doi.org/10.2989/10220119.2020.1815083

#### Abstract

Despite shrinking pastureland in the central highlands of Ethiopia, as a result of cropping, there has been little detailed work to evaluate effects of traditional grazing land management practices on vegetation and soil attributes. This study aimed to quantify vegetation structure, aboveground biomass yield and soil quality, as a result of the impact of enclosure and open access management practices by using a sampling quadrat. Aboveground biomass yield for the grass species was 17.6 and 31.2% higher, respectively, for the highland and mid-highland agro-ecologies for enclosed areas, compared with open-access grazing. Andropogon amethystinus (Important value index (IVI) = 86.9) and Pennisetum thunbergii (IVI = 79.2), the most dominant and highest density,

found in the enclosed areas decreased from open access grazing land and replaced by more resistant to continuous heavy grazing, like Eleusine floccifolia (IVI = 125.7) in the mid-highland area. Herbaceous species richness was better in open access grazing land than the enclosed areas. Soil quality parameters, such as total nitrogen, available phosphorous, calcium, sodium and cation exchange capacity, were significantly higher for enclosed areas than open access practice. In conclusion, enclosed areas performed greater in most of the parameters considered than open access grazing land management practices at both agro-ecologies. © 2021 The Author(s).

# Abza, T., Tadesse, S., & Andoshe, D. M. (2021). Characterization of cds/zns and cds/cos multilayer thin films synthesized by chemical bath deposition. *International Journal of Thin Film Science and Technology*, *10*(1), 1–6. Scopus. https://doi.org/10.18576/ijtfst/100101

### Abstract

In this work multilayer films of CdS/ZnS and CdS/CoS were prepared using the chemical bath deposition technique. The influence of substrate materials on structural, morphological, compositional and optical properties of the films was investigated. The powder X-ray diffraction (XRD) pattern of CdS/ZnS thin film showed nearly similar structure to that of the cubic ZnS structure. The XRD pattern of CdS/CoS thin films confirmed the co-existence of hexagonal and orthorhombic CdS phases. A cubic CdS structure is observed for CdS/glass thin film. The scanning electron microscopy (SEM) micrograph of CdS/glass film revealed spherical grains of size 125 nm covering the substrate uniformly without voids and cracks. The as large grain size as 800 nm with distinct grain boundaries was observed for CdS/ZnS multilayer film with some voids on the surface. The SEM micrograph of CdS/CoS thin film showed spherical surface grains of size 450 nm on flat and compact background. The energy dispersive X-ray spectra of single and multilayer CdS films confirmed the presence of Cd and S. The optical analysis of the CdS/glass, CdS/ZnS and CdS/CoS thin films confirmed band gaps of 2.5, 2.3 and 2.27 eV respectively.

Ewunie, G. A., Lekang, O. I., Morken, J., & Yigezu, Z. D. (2021). Characterizing the potential and suitability of Ethiopian variety Jatropha curcas for biodiesel production: Variation in yield and physicochemical properties of oil across different growing areas. *Energy Reports*, 7, 439–452. Scopus. https://doi.org/10.1016/j.egyr.2021.01.007

# Abstract

The increased cost of biodiesel production from edible oils has motivated the researchers to find alternative non-edible oil feedstocks. Jatropha curcas has been identified as a promising tropical and subtropical perennial energy crop for biodiesel production. However, securing adequate J. curcas oil for sustainable biodiesel production is not achieved yet. Therefore, the present study sought to investigate the potential and suitability of J. curcas grown at different areas of Ethiopia for biodiesel production using analytical, instrumental, and empirical methods. The dry weight proportion of J. curcas seeds, seed coats, and kernels were significantly varied across growing ecologies. The oil contents of kernels were reneged between 47.10–59.32%, while the free fatty acid content of all sampled oils was less than 2.7%. The estimated iodine and saponification values were ranged between 99.6–112.6 mg I2 and 180.9–202.0 mg KOH per gram of oil, respectively. Oleic (34.2–42.2%) and Linoleic (34.8–41.8%) acids dominated the fatty acid composition of J. curcas oil. The biodiesel fuel properties such as kinematic viscosity, density, cold filter plugging point, and cetane numbers predicted from the fatty acid composition of oils were agreed with EN-14214 standards. The k-means cluster revealed that kernels harvested from different geographic locations were grouped in the same cluster, which indicates that the effect of altitudinal variation on the oil content of J. curcas was not significant. However, at too lower and higher altitudes, the kernel's oil content has significantly declined. In conclusion, Ethiopian variety J. curcas oil showed suitable physicochemical properties for biodiesel production. However, its yield, composition, and physicochemical properties were significantly varied across growing areas.

Tigistu, T., & Abebe, G. (2021). Classification of rose flowers based on Fourier descriptors and color moments. *Multimedia Tools and Applications*, 80(30), 36143–36157. Scopus. https://doi.org/10.1007/s11042-021-11397-8

#### Abstract

In this paper, a rose-flower variety classification scheme, using color and shape features is presented. The first three statistical moments of the R, G, and B planes of the image were calculated to describe the color, while Fourier coefficients are used to describe the shape. For shape description, signatures (wave-forms) of the boundary contour of the binary images were extracted. Fourier coefficients that are used to describe the shape were estimated using the signatures generated. Depending on the Fourier coefficients, a representation of sums of angles formed along boundaries of the flowers was defined. Using these sums and the color features as input to an artificial neural network (ANN), the flowers were classified into their respective target classes. The eighteen flower varieties considered in this study were classified with an accuracy of 95.6%, 98.9%, and 100% using their shape, color, and combination of both shape and color features is an efficient criterion for rose flower variety discrimination and classification.

# Destaw, F., & Fenta, M. M. (2021a). Climate change adaptation strategies and their predictors amongst rural farmers in Ambassel district, Northern Ethiopia. *Jamba: Journal of Disaster Risk Studies*, 13(1), 1–11. Scopus. https://doi.org/10.4102/JAMBA.V13I1.974

#### Abstract

The present study was conducted in Ambassel district of Northern Ethiopia to understand adaptation strategies employed by rural farmers to the adverse effects of climate change and variability and factors that determine their adaptation decisions. The study was based on multistage sampling techniques to select the study villages and sampled households (HHs). Data were collected through HH survey, focus group discussions and key informant interviews. The collected data were analysed by using descriptive statistics and multinomial logit (MNL) model. The results revealed that in response to the effects of climate variability and change, the adaptation strategies deployed by farmers included terracing as soil and water conservation strategy, changing planting

date, fertiliser application, crop diversification with improved variety, income diversification and livestock diversification. The result from MNL analysis showed that age, family size, educational level, farm size, income, livestock holding, access to extension, distance to market, access to climate information and agroecological zones were amongst the factors that had a significant influence on farmers' choice of adaptation strategies. The basic barriers to climate change adaptation were lack of finance, shortage of land, inadequate climate information, lack of skill and shortage of labour. Therefore, strengthening interventions that enhance income generating activities and access to climate information should be an integral part of climate change adaptation strategies. Moreover, providing early maturing and high-value crop varieties that are more suited to the local environment is also crucial.

# Mekonnen, A., Tessema, A., Ganewo, Z., & Haile, A. (2021a). Climate change impacts on household food security and adaptation strategies in southern Ethiopia. *Food and Energy Security*, 10(1). Scopus. https://doi.org/10.1002/fes3.266

#### Abstract

Climate change is predicted to adversely affect agricultural yields, particularly in African countries such as Ethiopia, where crop production relies heavily on environmental factors such as rainfall and temperature. However, there have only been a limited number of studies on the effects of climate change dynamics on food security in Africa, particularly at the household level. We therefore analyzed local climatic changes, the status of household food security, climate-related causes of food insecurity, food security determinants, and the adaptation strategies of local farmers. Three decades meteorological data were analyzed. A total of 185 farmers were selected using simple random sampling and interviewed, together with focus groups. Data were analyzed using the descriptive and inferential statistics together with the logit regression model. Climate change over the last three decades was found to have a negative impact on the food security status of households. Crop production was constrained by poor rainfall, severe erosion, and increases in temperature. The unpredictability of rainfall, pests, and diseases were also contributing factors. Using the calorie intake approach, 60.5% of sampled respondents were found to be food insecure. Analysis using the logistic regression model showed that age and family size, as well as the amount of cultivated land and rainfall, were the significant (p <.05) factors influencing household food

security status. A large proportion (69.8%) of farmers were incorporating adapting strategies into farm management including improved use of crop varieties and livestock production, in addition to income diversification. Taken together, these findings show that improving climate change awareness, facilitating the participation of female-led households in income generation, and strengthening existing adaptation measures have positive impacts on food security.

# Mekonnen, A., Tessema, A., Ganewo, Z., & Haile, A. (2021b). Climate change impacts on household food security and farmers adaptation strategies. *Journal of Agriculture and Food Research*, 6. Scopus. https://doi.org/10.1016/j.jafr.2021.100197

#### Abstract

Climate change is predicted to adversely affect agricultural yields, particularly in African countries such as Ethiopia, where crop production relies heavily on environmental factors such as rainfall and temperature. However, there have only been a limited number of studies on the effects of climate change dynamics on food security in Africa, particularly at the household level. We therefore analyzed local climatic changes, the status of household food security, climate-related causes of food insecurity, food security determinants and the adaptation strategies of local farmers. Three decades meteorological data were analyzed. A total of 185 farmers were selected using simple random sampling and interviewed, together with focus groups. Data were analyzed using the descriptive and inferential statistics were used together with the logit regression model. Climate change over the last three decades was found to have a negative impact the food security status of households. Crop production was constrained by poor rainfall, severe erosion and increases in temperature. The unpredictability of rainfall, pests and diseases were also contributing factors. Using the calorie intake approach, 60.5% of sampled respondents were found to be food insecure. Analysis using the logistic regression model showed that age and family size, as well as the amount of cultivated land and rainfall were the significant (p < 0.05) factors influencing household food security status. A large proportion (69.8%) of farmers were incorporating adapting strategies into farm management including improved use of crop varieties and livestock production, in addition to income diversification. Taken together, these findings show that improving climate change awareness, facilitating the participation of female-led households in income generation and strengthening existing adaptation measures have positive impacts on food security.

Orsango, A. Z., Loha, E., Lindtjørn, B., & Engebretsen, I. M. S. (2021). Co-morbid anaemia and stunting among children 2-5 years old in southern Ethiopia: A community-based cross-sectional st

#### Abstract

#### Background

In Ethiopia, 38% of children less than 5 years of age are stunted and 57% are anaemic. Both have a negative impact later in life on physical growth and cognitive development and often coexist. There are few studies in Ethiopia that assessed co-morbid anaemia and stunting (CAS) and context-specific factors associated with it.

# Objective

The objective of this study was to assess the prevalence of CAS, and factors associated with CAS among children aged 2 to 5 years, in southern Ethiopia.

# Methods

A community-based cross-sectional survey was conducted among 331 randomly selected children in 2017. Mothers were interviewed using a structured questionnaire to obtain child and household information. Anthropometric measurements and blood samples for haemoglobin were collected. Stunting was defined as height-for-age Z-scores (HAZ) less than-2 SDs and anaemia was defined as altitude-adjusted haemoglobin levels less than 11.0 g/dL. CAS was defined when a child was both stunted and anaemic. Crude and adjusted multinomial logistic regression analyses were used to identify factors associated with CAS.

# Results

Out of 331 children studied, 17.8% (95% CI 13.87% to 22.4%) had CAS. Factors found significantly linked with higher odds of CAS were increased child age (adjusted OR (AOR) 1.0 (1.0 to 1.1)) and no iron supplementation during the last pregnancy (AOR (95% CI) 2.9 (1.3 to 6.2)). One factor found significantly linked to lower odds of CAS was food secured households (AOR (95% CI) 0.3 (0.1 to 0.9)).

### Conclusions

Co-morbid anaemia and stunting among children in the study area is of concern; it is associated with household food security, iron supplementation during pregnancy and child age. Therefore,

comprehensive interventions focusing on improving household food security and promoting iron supplementation for pregnant women are suggested.

# Dawed, M. Y., & Kebedow, K. G. (2021). Coexistence and harvesting optimal policy in three species food chain model with general Holling type functional response. *Natural Resource Modeling*, *34*(3). Scopus. https://doi.org/10.1111/nrm.12316

#### Abstract

In this paper, we have discussed harvesting of prey and intermediate predator species. Both are subjected to Holling type I-V functional response. Conditions for local and global stability of the nonnegative equilibria are verified. The permanent coexistence criterion of the model system and existence of optimal equilibrium solution of the control problem are demonstrated. Maximum sustainable yield and maximal net present revenue are determined. To confirm analytical results, numerical solution has been carried out using the Matlab™ ODE solver ODE45 and the simulations show the model system reveals complex behavior (such as oscillations), which reflects the real situation. Recommendations for Resource Managers. From our investigation of this study, we recommend to the management the following points. 1. Coexistence of the three species with harvesting, or persistence of the model system is possible provided that good management(treatment) of some factors (such as harvesting rate, growth rate of species, etc.) are performed. 2. The dynamics reveals complex behavior (such as oscillations), which reflects the real situation and it is sensitive to the above factors, especially the growth rate of the intermediate predator. 3. The policy makers should recommend the optimal effort (Formula presented.) to be applied and the optimal stock (Formula presented.) to harvest. This indicates that maximum profit will attain while securing sustainability of the three species in the ecosystem.

# Yuan, G., Wang, H., Khazaei, E., & Khan, B. (2021). Collaborative advanced machine learning techniques in optimal energy management of hybrid AC/DC IoT-based microgrids. *Ad Hoc Networks*, *122*. Scopus. https://doi.org/10.1016/j.adhoc.2021.102657

#### Abstract

Integration of renewable energies into the microgrid (MG) operation can potentially lead to some significant benefits, e.g., less transmission expansion planning cost, direct power supply to the

AC/DC loads based on its type, lower costs, higher power quality services and enhanced technology. However, the optimal energy management of the system would be more challenging and complicated. To this end, this paper proposes an effective energy management method for optimal managing of the hybrid AC/DC microgrids using advanced machine learning. The proposed method is composed of two main parts for forecasting and scheduling, wherein the former uses the one class support vector for accurate forecasting and the latter uses the heuristic method for optimal unit commitment. To support the renewable energy technology, all power generated by wind and solar units are purchased by the main grid. The optimization algorithm, inspired from improved whale optimization, is used not only for optimal unit scheduling within the hybrid microgrid but also for adjusting the setting parameters of the forecasting model. To this end, in this paper, for the first time, a new machine learning-enable heuristic technique framework has been developed to not only increase the convergence speed of the algorithm, but also enhancement the accuracy of the algorithm. Results on an IEEE test system demonstrate the high efficiency and merit of the proposed algorithm. Indeed, the simulation results in three different scheduling plans (SPs) show that the proposed framework does not only optimize the total operation costs, but also corrects the voltage profile and minimizes the power losses. These differences can highly distinct the proposed technique from the conventional techniques.

Fiseha, S. B., Jara, G. M., Woldetsadik, E. A., Bekele, F. B., & Ali, M. M. (2021). Colonization rate of potential neonatal disease-causing bacteria, associated factors, and antimicrobial susceptibility profile among pregnant women attending government hospitals in hawassa, ethiopia. *Infection and Drug Resistance*, 14, 3159–3168. Scopus. https://doi.org/10.2147/IDR.S326200

# Abstract

### Introduction

Vaginal colonization with some species of bacteria during the last term of pregnancy can affect the health of fetuses and newborns resulting in high morbidity and mortality among newborns.

#### Objective

The aim of this study was to determine the colonization rate of potential neonatal disease-causing bacteria, factors associated with colonization rate, and the antimi-crobial susceptibility profile of bacteria among pregnant women.

### Methods

Institution-based cross-sectional study was conducted on pregnant women from October 13 to December 28, 2020, at government hospitals located in Hawassa, Ethiopia. Background data were captured using a structured questionnaire. Vaginal swabs were collected to isolate bacteria using the standard method. Antimicrobial susceptibility test was performed using the modified Kirby–Bauer disc diffusion method. Data were analyzed using SPSS. Factors that could predict vaginal colonization with potential neonatal disease-causing bacteria were determined using logistic regression.

# Results

Overall bacterial colonization rate among pregnant women was 271 (98.9%) 95 CI (97.4–100.1). The prevalence of potential neonatal disease-causing bacteria was 95 (34.7%) 95 CI (28.8–40.1). The proportion of potential neonatal disease-causing bacteria were as follows: Escherichia coli (n=82, 29.9%), Acinetobacter species (n=9, 3.3%), Staphylococcus aureus (n=7. 2.6%), and Klebsiella pneumoniae (n=4, 1.5%). Pregnant women with a gestational age of 38–40 weeks were 1.9 times (AOR= 1.9, 95% CI= 1.0–3.4, p=0.04) were more likely to be colonized by potential neonatal disease-causing bacteria. All E. coli, Klebsiella species, and Acinetobacter species were susceptible to gentamicin and imipenem. All S. aureus were susceptible to penicillin, tetracycline, clindamycin, and erythromycin.

#### Conclusion

High proportion of pregnant women in this study were colonized with potential neonatal diseasecausing bacteria. E. coli was the predominant bacteria. Most bacteria isolated in this study were susceptible to antimicrobial agents tested. Gestational age was significantly associated with the colonization rate of potential neonatal disease-causing bacteria. Zerssa, G. W., Kim, D.-G., Koal, P., & Eichler-Löbermann, B. (2021). Combination of compost and mineral fertilizers as an option for enhancing maize (Zea mays l.) yields and mitigating greenhouse gas emissions from a nitisol in ethiopia. *Agronomy*, *11*(11). Scopus. https://doi.org/10.3390/agronomy11112097

#### Abstract

Combined application of organic and mineral fertilizers has been proposed as a measure for sustainable yield intensification and mitigation of greenhouse gas (GHG) emissions. However, fertilizer effects strongly depend on the soil type and still no precise information is available for Nitisols in Ethiopia. The study evaluated effects of different ratios of biowaste compost and mineral fertilizers (consisting of nitrogen (N), phosphorus (P), and sulphur (S)) on maize (Zea mays L. Bako-hybrid) yields in a two-year field trial. Soil samples from each treatment of the field trial were used to estimate emissions of nitrous oxide (N2O), carbon dioxide (CO2), methane (CH4), and microbial activity in a 28-day incubation experiment with two moisture levels (40% and 75% water-filled pore space, WFPS). The application of fertilizers corresponded to a N supply of about 100 kg ha–1, whereby the pure application of mineral fertilizers (100 min) was gradually replaced by compost. Maize yields were increased by 12 to 18% (p < 0.05) in the combined treatments of compost and mineral fertilizers compared to the 100 min treatment. The cumulative emissions of N2O and CO2 but not CH4 were affected by the fertilizer treatments and soil moisture levels (p < 0.05). At 75% WFPS, the N2O emissions in the 100 min treatment was with 16.3 g ha-1 more than twice as high as the treatment with 100% compost (6.4 g ha-1) and also considerably higher than in the 50% compost treatment (9.4 g ha-1). The results suggest that a compost application accounting for 40 to 70% of the N supply in the fertilizer combinations can be suitable to increase maize yields as well as to mitigate GHG emissions from Nitisols in Southwestern Ethiopia.

Ali, M. A., Balcha, E. S., Woldesemayat, A. A., & Tirore, L. D. (2021). Combined assessment of tuberculosis case notification rate and infection control at health facilities of Dale districts, Sidama Zone, Southern Ethiopia. *PLoS ONE*, *16*(10 October). Scopus. https://doi.org/10.1371/journal.pone.0242446

#### Abstract

#### Background

Mycobacterium tuberculosis (TB) is the deadliest disease that claims millions of deaths globally. Ethiopia is among the countries heavily hit by the disaster. Despite the effective directly observed treatment and TB infection control (TBIC) measures provided by the world health organization (WHO), the rate of new cases increased daily throughout the country. Healthcare workers (HCWs) are at highest risk serving without having the necessary facility in place while overcrowding of patients exacerbated TB transmission. The study aimed to assess TBIC implementation and analyze case notification rate (CNR) of smear-positive pulmonary TB in the selected health facilities at Dale district, Sidama Zone, Southern Ethiopia.

#### Methods

Seven health care facilities have been visited in the study area and smear-positive pulmonary TB notification rate was determined retrospectively during the years 2012 to 2014. Data on smear positive test results and demographic characteristics were collected from the TB unit registries. A structured questionnaire, facility survey, and observation checklists were used to assess the presence of TBIC plans at the health care facilities.

#### Results

The overall case notification rate of smear-positive pulmonary tuberculosis was 5.3% among all 7696 TB suspected patients. The odds of being diagnosed with smear-positive TB were 24% more in males than in females (adj OR = 1.24, 95% CI: (1.22, 1.55). Moreover, in the study area, only 28% of the facilities have been practiced TB infection control and 71% of the facilities assigned a focal person for the TBIC plan. The implementation of environmental control measures in the facilities was ranged between 16–83%. N95 particulate respirators were found only in 14% of the facilities.

#### Conclusion

TB CNR in Dale district was low. Moreover, implementations of TBIC in Dale district health facilities were poor when the survey was done. Hence, urgent measures should be taken to reverse the burden of TB.

Mekuria, S., Mekonnen, T. K., & Kebede, N. (2021). Community Perception on Trypanosomosis, Parasitological, and Entomological Studies in Two Selected Districts of South Omo Zone, Ethiopia. *Veterinary Medicine International*, 2021. Scopus. https://doi.org/10.1155/2021/8439698

#### Abstract

Participatory investigation and trypanosomosis prevalence studied during April 2019 and March 2020 in two selected districts of South Omo, Ethiopia. The study site is located in the gridline of 04.90 to 5.60oN and 35.80 to 36.900 E. Twelve community groups are employed. A crosssectional study design and 288 animals bled and examined a wet film prepared from the buffy coat. Sixty NGU traps baited with acetone and cow urine were deployed for 48 hrs to estimate the apparent density. Data generated from focus group discussion and trypanosomosis prevalence analyzed using an appropriate statistical package. Proportional piling showed that cattle, goats, and sheep were proportionally dominant with a high median score of 32(14-40), 26(12-33), and 21(5-23), respectively; trypanosomosis ranked first with a proportional median score of 24(13-26) followed by contagious bovine/caprine pleuropneumonia with a proportional median score of 23(19-26) among others. Community unanimously agreed that (W = 0.9) trypanosomosis affects their socioeconomic status and was able to describe clinical signs with significant (p < 0.05) 0.05). Perception on human trypanosomosis varies between Benna Tsemay and Gnagatom districts. Therefore, further study supported by laboratory like molecular test is very important to conclude the presence of human trypanosomosis in the suggested area. The overall prevalence of cattle trypanosomosis was 10.1%. The prevalence of trypanosomosis was significantly higher in poor body condition (OR = 2.1, P < 0.05) and in black coat color (OR = 13.5, P < 0.05) animals. T. congolense and T. vivax were circulating in the area. A total of 455 Glossina (385 G. pallidipes, 17 G. tachinoides, and 53 G. fuscipes) were trapped. The overall apparent density of Glossina was 3.79 Flies/Trap/Day. Three species of Glossina, namely G. pallidipes, G. tachinoides, and G.

fuscipes, were distributed in the study areas. Therefore, the finding suggests that the problem is significant and the human trypanosomosis is doubtful. Hence regular control measures and molecular diagnosis need to be conducted.

Bante, A., Mersha, A., Zerdo, Z., Wassihun, B., & Yeheyis, T. (2021). Comorbid anxiety and depression: Prevalence and associated factors among pregnant women in Arba Minch zuria district, Gamo zone, southern Ethiopia. *PLoS ONE*, *16*(3 March). Scopus. https://doi.org/10.1371/journal.pone.0248331

## Abstract

#### Introduction

Prenatal anxiety and depression are major health problems all over the world. The negative sequela of prenatal comorbid anxiety and depression (CAD) has been suggested to be higher than that of anxiety or depression alone. CAD increases the odds of preterm birth, low birth weight, prolonged labor, operative deliveries, postpartum psychiatric disorders and long term cognitive impairment for the newborn. Despite its significant ill consequences, there is a dearth of studies in low-And middle-income countries. So far, to the best of our knowledge, no study assessed the prevalence of CAD in Ethiopia. Hence, the purpose of this study was to assess CAD and associated factors among pregnant women in Arba Minch Zuria district, Gamo zone, southern Ethiopia.

# Methods

A community-based cross-sectional study was conducted among 676 pregnant women from January 01 to November 30, 2019. Patient Health Questionnaire 9-item (PHQ-9) and Generalized Anxiety Disorder 7-item (GAD-7) scales were used to assess depression and anxiety respectively. The data were collected electronically using an open data kit (ODK) collect android application and analyzed using Stata version 15.0. Bivariate and multivariable analyses were carried out to identify factors associated with CAD using binary logistic regression. Statistical significance was set at p-value 0.05.

# Results

A total of 667 women were involved. The prevalence of CAD was 10.04% [95% confidence interval (CI): 7.76, 12.33]. Being married [adjusted odds ratio (AOR): 0.16, 95% CI: 0.05, 0.56], categorized in the highest wealth quintile [AOR: 2.83, 95% CI: 1.17, 6.84], having medical illness [AOR: 3.56, 95% CI: 1.68, 7.54], encountering pregnancy danger signs [AOR: 2.66, 95% CI: 1.06,

6.67], experiencing life-Threatening events [AOR: 2.11, 95% CI: 1.15, 3.92] and household food insecurity [AOR: 3.51, 95% CI: 1.85, 6.64] were significantly associated with CAD.

# Conclusions

In general, one in every ten women faced CAD in the study area. Nutritional interventions, early identification and treatment of pregnancy-related illness and medical ailments, prenatal mental health problems screening and interventions are imperative to minimize the risk of CAD in pregnant women.

# Gebre, A., Shaikh, J., Kebede, T., & Gelete, F. Z. (2021). Comparative Performance Analysis of Channel Estimation Techniques for Massive MIMO System. 236–239. Scopus. https://doi.org/10.1109/InCAP52216.2021.9726282

# Abstract

The need for an internet connection is growing globally. So, day-by-day people need much higher data rate connection to meet their need but every physical resource in communication like frequency band, transmit signal strength are finite. Within the given limited resource, higher data speed is accomplished by a new technology called massive Multiple Input Multiple Output (massive MIMO) system. Massive MIMO fulfills the high data rate requirement through antenna diversity gain. It is one of the keys to guarantee 5G wireless network technology and it array antenna at both transmitter and receiver sides to providing high spectral and energy efficiencies. In massive MIMO, the signal obtained by the receiver is in different phase and amplitude from the transmission signal. Therefore, the system quality is tremendously depends on the accuracy of the channel estimation. Channel estimation plays a significant role in the performances of massive MIMO system because the dimension of the channels matrix is large, phase changes and noises are added when the signals pass through channel, these reduces the efficiencies of the whole system. To solve these problems, this paper focuses on the comparative analysis of pilot-based channel estimation schemes for massive MIMO system, which includes: Minimum Mean square Error (MMSE), Element Wise Minimum Mean Square Error (EW-MMSE), Maximum Likelihood (ML) and Least Square (LS) estimator with respect to Normalized Mean square Error (NMSE), Signal to Noise Ratio (SNR), number of BS antennas, and number of computational complexities.

Getahun, A. M., Hunderra, G. C., Gebrezihar, T. G., Boru, B. G., Desta, N. T., & Ayana, T. D. (2021). Comparative study on lesions of reproductive disorders of cows and female dromedary camels slaughtered at Addis Ababa, Adama and Akaki abattoirs with bacterial isolation and characterization. *BMC Veterinary Research*, *17*(1). Scopus. https://doi.org/10.1186/s12917-021-02822-z

#### Abstract

#### Background

Reproduction is a basic prerequisite to efficient livestock production. Reproductive performance depends on the normal structure and function of genital organs. A cross-sectional study was conducted from November 2016 to May 2017 to identify and compare the frequency of reproductive tract pathological lesions and to isolate bacteria associated to uterine lesions in female dromedary camels and cows slaughtered at Akaki camel slaughterhouse and Addis Ababa and Adama municipal abattoirs. Purposive sampling technique was employed to include and examine the reproductive tracts of all slaughtered animals (280; 140 cows and 140 camels) during the study period.

#### Result

The study examined a total of 280 (140 cows and 140 camels) reproductive tracts. Various pathological lesions with different degrees of severity were observed in 48 (34.2%) and 51 (36.4%) of dromedary camels and cows, respectively. In dromedary camels, the most prevalent lesion was uterine lesions (21.4%) followed by ovarian lesions (7.14%); while in cows, ovarian lesions were the most prevalent (16.4%) followed by uterine lesions (14.2%). In general, 56 bacteria were isolated from cows' uterine lesion, the Staphylococcus species (28.5%), Streptococci species (19.6%), Coynebacterium species (8.9%), Escherichia coli (26.78%), Salmonella species (10.7%) and Klebsiella species (5.35%) being the most representative isolates. In camels, however, 45 bacteria were isolated from uterine lesions with higher prevalence of Escherichia coli (35.5%), Staphylococcus species (26.6%), Streptococcus species (13.3%), Pseudomonas species (6.6%), Proteus species (4.4%), Salmonella species (8.8%) and Klebsiella species (4.4%). Bacteriological data showed that the major isolates were similar, although slightly more frequent in occurrence in cows. Microscopically, uterine inflammatory lesions evidenced endometrial glands degeneration, epithelium sloughing, peri-glandular cuffing, and inflammatory cells infiltration.

### Conclusions

In female dromedary camels and cows, pathological lesions of the reproductive tract showed great prevalence, with similarity in bacterial isolates in both species. The role of each reproductive lesion and bacterial isolates as causal agents of reproductive failures in these livestock species, however, needs further investigation

Enyew, B. Y., & Asfaw, Z. G. (2021). Comparison of survival models and assessment of risk factors for survival of cardiovascular patients at addis ababa cardiac center, ethiopia: A retrospective study. *African Health Sciences*, 21(3), 1201–1213. Scopus. https://doi.org/10.4314/ahs.v21i3.29

### Abstract

#### Background

Cardiovascular diseases (CVDs) is disorders of heart and blood vessels. It is a major health problem across the world, and 82% of CVD deaths is contributed by countries with low and middle income. The aim of this study was to choose appropriate model for the survival of cardiovascular patients data and identify the factors that affect the survival of cardiovascular patients at Addis Ababa Cardiac Center.

#### Method

A Retrospective study was conducted on patients under follow-up at Addis Ababa Cardiac Center between Sep-tember 2010 to December 2018. The patients included have made either post operation or pre-operation. Out of 1042 cardiac patients, a sample of 332 were selected for the current study using simple random sampling technique. Non-parametric, semi-parametric and parametric survival models were used and comparisons were made to select the appropriate predicting model.

#### Results

Among the sample of 332 cardiac patients, only 67(20.2%) experienced CVD and the remaining 265(79.8%) were censored. The median and the maximum survival time of cardiac patients was 1925 and 1403 days respectively. The estimated hazard ratio of male patients to female patients is 1.926214 (95%CI: 1.111917-3.336847; p = 0.019) implying that the risk of death of male patients is 1.926214 times higher than female cardiac patients keeping the other covariates constant in the model. Even if, all semi parametric and parametric survival models fitted to the current data well,

various model comparison criteria showed that parametric/weibull AFT survival model is better than the other.

## Conclusions

The governmental and non-governmental stakeholders should pay attention to give training on the risk factors identified on the current study to optimize individual's knowledge and awareness so that death due to CVDs can be minimized.

Ruiz, L., Alba, C., García-Carral, C., Jiménez, E. A., Lackey, K. A., McGuire, M. K., Meehan, C. L., Foster, J., Sellen, D. W., Kamau-Mbuthia, E. W., Kamundia, E. W., Mbugua, S., Moore, S. E., Prentice, A. M., Gindola K, D., Otoo, G. E., Pareja, R. G., Bode, L., McGuire, M. A., ... Rodríguez, J. M. (2021). Comparison of Two Approaches for the Metataxonomic Analysis of the Human Milk Microbiome. *Frontiers in Cellular and Infection Microbiology*, *11*. Scopus. https://doi.org/10.3389/fcimb.2021.622550

# Abstract

Recent work has demonstrated the existence of large inter-individual and inter-population variability in the microbiota of human milk from healthy women living across variable geographical and socio-cultural settings. However, no studies have evaluated the impact that variable sequencing approaches targeting different 16S rRNA variable regions may have on the human milk microbiota profiling results. This hampers our ability to make meaningful comparisons across studies. In this context, the main purpose of the present study was to re-process and re-sequence the microbiome in a large set of human milk samples (n = 412) collected from healthy women living at diverse international sites (Spain, Sweden, Peru, United States, Ethiopia, Gambia, Ghana and Kenya), by targeting a different 16S rRNA variable region and reaching a larger sequencing depth. Despite some differences between the results obtained from both sequencing approaches were notable (especially regarding alpha and beta diversities and Proteobacteria representation), results indicate that both sequencing approaches revealed a relatively consistent microbiota configurations in the studied cohorts. Our data expand upon the milk microbiota results we previously reported from the INSPIRE cohort and provide, for the first time across globally diverse populations, evidence of the impact that different DNA processing and sequencing approaches have on the microbiota profiles obtained for human milk samples. Overall, our results corroborate some similarities regarding the microbial communities previously reported for the INSPIRE cohort, but some differences were also detected. Understanding the

impact of different sequencing approaches on human milk microbiota profiles is essential to enable meaningful comparisons across studies. Clinical Trial Registration: www.clinicaltrials.gov, identifier NCT02670278.

# Chikako, T. U., Seidu, A.-A., Hagan, J. E., & Ahinkorah, B. O. (2021). Complex multilevel modelling of the individual, household and regional level variability in predictors of undernutrition among children aged 6–59 months in ethiopia. *Nutrients*, *13*(9). Scopus. https://doi.org/10.3390/nu13093018

#### Abstract

Worldwide, ten and a half million children under five die every year, with 98% of these deaths in low-and middle-income countries, including Ethiopia. Undernutrition is a serious public health problem in Ethiopia and children are the most affected segments of the population. This study, therefore, sought to investigate the socio-economic, demographic, health and environmental factors associated with undernutrition among children aged 6-59 months in Ethiopia. Data were obtained from the 2016 Ethiopian Demographic and Health Survey. In this study, anthropometric data (height and weight) and other variables of 9461 children were measured. Descriptive statistics and multilevel logistic regression models were fitted. The descriptive results revealed that about 27.5% of the children aged between 6–59 months were undernourished. Place of residence, employment status of the mother, educational status of the mother, the mother's nutritional status, age of the child, birth order of children, source of drinking water, diarrhea and fever among children in the two weeks before the survey were the most important factors associated with undernutrition among children aged 6–59 months in Ethiopia. The findings indicate that it is useful to support health care and food security programs in rural areas to directly address food insecurity and undernutrition problems of the poor and exposed communities in rural parts of the country. The education sector must increase mothers' access to education in all areas to help identify the quality of healthcare and the required attention needed for their children. The health sector should increase their health education programs on the importance of exclusive breastfeeding.

Ramadoss, J., Venkatesh, J., Joshi, S., Shukla, P. K., Jamal, S. S., Altuwairiqi, M., & Tiwari, B. (2021). Computer Vision for Human-Computer Interaction Using Noninvasive Technology. *Scientific Programming*, 2021. Scopus. https://doi.org/10.1155/2021/3902030

#### Abstract

Computer vision is a significant component of human-computer interaction (HCI) processes in interactive control systems. In general, the interaction between humans and computers relies on the flexibility of the interactive visualization system. Electromyography (EMG) is a bioelectric signal used in HCI that can be captured noninvasively by placing electrodes on the human hand. Due to the impact of complex background, accurate recognition and analysis of human motion in real-time multitarget scenarios are considered challenging in HCI. Further, EMG signals of human hand motions are exceedingly nonlinear, and it is important to utilize a dynamic approach to address the noise problem in EMG signals. Hence, in this paper, the Optimized Noninvasive Human-Computer Interaction (ONIHCI) model has been proposed to predict human motion recognition. Average Intrinsic Mode Function (AIMF) has been used to reduce the noise factor in EMG signals. Furthermore, this paper introduces spatial thermographic imaging to overcome the conventional sensor problem, such as gesture recognition and human target identification in multitarget scenarios. The human motion behavior in spatial thermographic images is examined by target trajectory, and body movement kinematics is employed to classify human targets and objects. The experimental findings demonstrate that the proposed method reduces noise by 7.2% and improves accuracy by 97.2% in human motion recognition and human target identification.

# Amare, H. H., & Lindtjorn, B. (2021a). Concurrent anemia and stunting among schoolchildren in Wonago district in southern Ethiopia: A cross-sectional multilevel analysis. *PeerJ*, 9. Scopus. https://doi.org/10.7717/peerj.11158

#### Abstract

#### Background

Even if many schoolchildren in Ethiopia are anemic and stunted, few have studied the co-existence of anemia and stunting among schoolchildren in Ethiopia. In addition, multilevel analysis to explore the variation in prevalence of concurrent anemia and stunting (CAS) across schools and classes is rarely applied. Thus, we aimed to assess the prevalence and risk factors of CAS at the individual, household, and school level among schoolchildren in southern Ethiopia.

# Methods

We recruited 864 students aged 7–14 years from the Wonago district in southern Ethiopia using a three-stage random sampling, assigning four schools to level one, 24 classes to level two. We then randomly selected 36 children from each class, and recorded their weight, height, haemoglobin, intestinal helminthic infections, hygienic practices, dietary practices, household food insecurity, and socio-demographic information. A multivariate, multilevel logistic regression model was applied to detect potential risk factors for CAS.

# Results

The prevalence of CAS was 10.5% (85/810) among schoolchildren, which increased with age in years (adjusted odds ratio [aOR] 1.39 [95% confidence interval 1.13, 1.71, P = 0.002]) and among children who always did not wash their hands with soap after use of latrine (aOR 4.30 [1.21, 15.3, P = 0.02]). Children who walked barefoot (aOR 10.4 [2.77, 39.1, P = 0.001]), were infected with Trichuris trichiura (aOR 1.74 [1.05, 2.88, P = 0.03]), or had head lice infestation (aOR 1.71 [1.01, 2.92, P = 0.04]) had higher CAS prevalence. Prevalence rates of CAS were low in those using treated drinking water (aOR 0.32 [95% CI 0.11, 0.97, P = 0.04]). Most of the risk factors for CAS were identified at the individual level. The clustering effect measured by the intra-cluster correlation coefficient was 6.8% at school level and 19% at class.

# Conclusion

CAS prevalence is a moderate public health problem among schoolchildren in southern Ethiopia and varies across classes and schools. After controlling for clustering effects at the school and class levels, we found an association between CAS and increasing age, not always washing hands with soap after using latrine, walking barefoot, and T. trichiura infection. Using treated water for drinking was found to have a protective effect against CAS. Thus, educating children on personal hygiene and provision of safe drinking water could reduce the CAS burden in schoolchildren in rural areas of southern Ethiopia. Zenebe, M. H., Mekonnen, Z., Loha, E., & Padalko, E. (2021a). Congenital Cytomegalovirus Infections Mother-Newborn Pair Study in Southern Ethiopia. *Canadian Journal of Infectious Diseases and Medical Microbiology*, 2021. Scopus. https://doi.org/10.1155/2021/4646743

#### Abstract

#### Introduction

Congenital cytomegalovirus (cCMV) is a common cause of neurodevelopmental delays and sensorineural hearing loss of infants, yet the prevalence of cCMV and the associated factors in Ethiopia are not studied. Hence, this study was to assess the prevalence and associated factors of cCMV in Southern Ethiopia.

### Methodology

A mother-newborn pair cross-sectional study was conducted at Hawassa University Comprehensive and Specialized Hospital, Ethiopia. Newborn's saliva sample was tested for cCMV using Alethia CMV molecular assay. Mothers' serum was tested serologically for anti-CMV IgM and IgG by EUROIMMUN ELISA. Pregnant women responded to a questionnaire about their previous and current obstetric history and sociodemographic characteristics. The chisquare ( $\chi$ 2) test and independent-sample t-test were used to determine the associations between infections and possible risk factors; then, potential variables were screened for multivariable analysis.

#### **Results**

A total of 593 mother-newborn pairs were assessed. CMV was detected in 14 of 593 newborn saliva swabs (2.4%; 95% CI 1.2-3.7). As assessed by CMV IgM-positive results, maternal CMV seropositivity was 8.3% (49/593); thus, the rate of mother-to-child transmission of CMV was 28% (14/49) among CMV IgM-positive women. Congenital CMV infection was significantly associated with maternal exposure through nursery school children in the household, women sharing a feeding cup with children, and any of the detected curable STIs during pregnancy. Birth weight was negatively associated with CMV infection. Maternal age, gravidity, level of education, and sharing of children feeding utensils were not associated with cCMV infection.

#### Conclusion

A high rate of cCMV infection in the absence of awareness demands further in-depth investigation in Ethiopia. Thus, policymakers must take appropriate action through the antenatal care system for prevention strategies and put in place a constant health education and awareness creation of pregnant women about the causes of infection and hygienic measures.

Yeshaneh, A., Lencha, A., Aweke, A. M., Dessalew, Y., Wale, T., Mekuriya, E., Abdulahi, T., Workineh, A., Yitayew, M., Dinku, H., & Asfaw, G. (2021). Consistent condom utilization and associated factors among HIV positive clients attending ART clinic at Pawi general hospital, North West Ethiopia. PLoS ONE, 16(12 December). Scopus. https://doi.org/10.1371/journal.pone.0261581

# Abstract

# Background

Human immunodeficiency virus (HIV) affects a highly significant number of people and is responsible for the deaths of many people in sub-Saharan African countries alone. The best prevention method for this virus is through consistent condom utilization which can help to prevent drug-resistant HIV infection and acquisition of new infection. Therefore, this study aimed to assess consistent condom utilization and associated factors among HIV-positive individuals attending an antiretroviral therapy clinic at Pawi general hospital, North West Ethiopia in 2020.

#### Methods

An institutional based cross-sectional study was conducted among 419 HIV-positive individuals who have follow-up in the Pawi general hospital antiretroviral therapy clinics, from January to February 2020. The study subjects were reached using a systematic sampling technique and data were collected using a pretested and structured questionnaire. Data entry and analysis were performed using epi-data version 3.1 and SPSS version 23 respectively. Binary and multivariable analyses with a 95% confidence level were performed. In the final model, variables with P < 0.05 were considered statistically significant.

#### Results

A total of 419 antiretroviral therapy study participants were participated in the study with a response rate of 100%. In this finding, the consistent condom utilization rate was 49.2% [95% CI: 42.2-56.5%]. After controlling for possible confounding factors, the results showed that place of residence [AOR = 2.16, 95% CI: 1.05, 4.45], marital status [AOR = 0.19, 95% CI: 0.05, 0.67], number of partners [AOR = 0.19, 95% CI: 0.07, 0.55] and level of education [AOR = 5.33, 95% CI: 1.57, 18.08] were associated factors of consistent condom utilization.

## Conclusion

Consistent condom utilization among HIV-positive clients attending antiretroviral therapy clinics at Pawi general hospital was low. Residence, marital status, level of education and number of partners were significantly associated factors of consistent condom use. Health education program and counseling services should be started to increase knowledge about way of transmission and appropriate use of condoms, increase self-efficacy towards condom use and reduction in the number of sexual partners.

# Haji, B., & Workagegn, K. B. (2021). Constraints hindering small scale aquaculture production in southern Ethiopia. *Aquaculture International*, 29(2), 565–574. Scopus. https://doi.org/10.1007/s10499-020-00641-x

### Abstract

Ethiopia has a great potential for small scale aquaculture development. However, the overall fish production in the country is very low due to several constraints. Therefore, this study was aimed to identify major constraints affecting the development of small scale aquaculture production and forward possible intervention for further research, extension work and policy makers. For this purpose, questionnaire survey and visual observation were used to collect primary data. A total of 300 fish farming households having artificial fish pond were purposively selected. Data were analyzed using SPSS software. The study showed that five major constraints hindering the development and the promotion of aquaculture production were identified. The most serious constraint was the absence of aquaculture technologies (as reported by 72.7–85% of the total respondents) followed by shortage of sustainable quality fish seeds and feeds supply (as reported by 60–80% of the total respondents), while low Nile tilapia yield (as reported by 32.5–34.5% of the total respondents) was the least constraint across and within the two studied areas. The rank and the trend of the constraints across the two areas were the same, while it was different among different agro-ecologies. In conclusion, the first two identified aquaculture production constraints, i.e. applicable technology transfer gap and shortage of sustainable quality fish seeds and feeds supply, were taken the most serious problems affecting the development of aquaculture in the study areas and beyond. Thus different stakeholders should be integrated to work on the adoption of appropriate aquaculture technologies and production of quality fish seeds and feeds.

# Astatkie, H., Ambelu, A., & Mengistie, E. (2021). Contamination of Stream Sediment With Heavy Metals in the Awetu Watershed of Southwestern Ethiopia. *Frontiers in Earth Science*, 9. Scopus. https://doi.org/10.3389/feart.2021.658737

#### Abstract

Surface sediment samples were collected from different streams of Awetu Watershed in southwestern Ethiopia. Sediment samples were analyzed for As, Cd, Cr, Pb, and Hg levels using inductively coupled plasma optical emission spectrometry. The heavy metal concentration ranged from 183.60 to 1,102.80 mg/kg for As (mean  $623.32 \pm 291.65$  mg/kg), 4.40-303.20 mg/kg for Cd  $(151.09 \pm 111.5 \text{ mg/kg}), 149.20-807.20 \text{ mg/kg}$  for Cr  $(375 \pm 212.03 \text{ mg/kg}), 485.60-$ 3,748.80 mg/kg for Pb (2005.94  $\pm$  954.99 mg/kg) and 3.6–5.6 mg/kg for Hg (4.64  $\pm$  0.59 mg/kg). The mean heavy metal concentration in the streams followed the decreasing order of Pb > As > Cr> Cd > Hg. As, Cr and Pb are detected at high concentrations with values of 623.32, 375.00, and 2,005.94 mg/kg respectively. A low level of heavy concentration (3.6 mg/kg) was recorded for Hg. The contamination factor (CF) of all the studied heavy metals ranged from a low degree (CF < 1) to a very high degree (CF  $\leq 6$ ). Mainly, Dololo and Kito streams show a very high degree of contamination (CF  $\leq$  6) than Awetu and Boye streams. Specifically, As, Cd and Cr in the Dololo and Kito streams have significantly elevated concentrations than others. Geo-accumulation index (Igeo) shows low to moderate contamination level with As, Pb, and Hg; uncontaminated to heavily contaminated by Cr; and moderate to extreme contamination by Cd. Untreated solid waste, garages and farmlands were sources of contamination. Streams receiving wastewater effluents from teaching institutions had higher heavy metal concentrations. Dumping of electronic wastes and car washing discharges also identified as another source of pollution.

Dadi, T. L., Medhin, G., Kasaye, H. K., Kassie, G. M., Jebena, M. G., Gobezie, W. A., Alemayehu, Y. K., & Teklu, A. M. (2021). Continuum of maternity care among rural women in Ethiopia: Does place and frequency of antenatal care visit matter? *Reproductive Health*, *18*(1). Scopus. https://doi.org/10.1186/s12978-021-01265-x

#### Abstract

#### Introduction

The ministry of health (MOH) of Ethiopia recommends 4 or more focused antenatal care (ANC) visits at health centre (HC) or at a higher level of health facility (HF). In Ethiopia, few studies investigated time dimension of maternal health continuum of care but lack data regarding place dimension and its effect on continuum of care. The aim of this study is to estimate effect of place of ANC-1 visit and adherence to MOH's recommendations of MOH for ANC visits on continuum of care rural in Ethiopia.

### Methods

We used data collected from 1431 eligible women included in the National Health Extension Program (HEP) assessment survey that covered 6324 households from 62 woredas in nine regions. The main outcome variable is continuum of care (CoC), which is the uptake of all recommended ANC visits, institutional delivery and postnatal care services. Following descriptive analysis, Propensity Score Matching was used to estimate the effect of place of ANC-1 visit on completion of CoC. Zero inflated Poisson regression was used to model the effect of adherence to MOH recommendation of ANC visits on intensity of maternal health continuum of care.

#### Result

Only 13.9% of eligible women completed the continuum of care, and place of first antenatal care (ANC) visit was not significantly associated with the completion of continuum of care ( $\beta = 0.04$ , 95% CI = -0.02, 0.09). Adherence of ANC visit to the MOH recommendation (at least 4 ANC visits at higher HFs than health posts (HPs)) increased the likelihood of higher intensity of continuum of care (aIRR = 1.29, 95% CI: 1.26, 1.33). Moreover, the intensity of continuum of care was positively associated with being in agrarian areas (aIRR = 1.17, 95% CI: 1.06, 1.29), exposed to HEP (IRR = 1.22, 95% CI: 1.16, 1.28), being informed about danger signs (aIRR = 1.14, 95% CI: 1.11, 1.18) and delivery of second youngest child at HF (IRR = 1.16, 95% CI: 1.13, 1.13).

1.20). Increasing age of women was negatively associated with use of services (IRR = 0.90, 95% CI: 0.87, 0.94).

#### Conclusion

Completion of maternal health continuum of care is very low in Ethiopia, however most of the women use at least one of the services. Completion of continuum of care was not affected by place of first ANC visit. Adherence to MOH recommendation of ANC visit increased the intensity of continuum of care. Intensity of continuum of care was positively associated with residing in agrarian areas, HEP exposure, danger sign told, delivery of second youngest child at health facility. To boost the uptake of all maternal health services, it is crucial to work on quality of health facilities, upgrading the infrastructures of HPs and promoting adherence to MOH recommendations of ANC visit.

Belay, M. H., Beshir, H. M., Terfa, M. T., & Roro, A. G. (2021). Control of growth and flowering of chrysanthemum (Dendranthema x grandiflorum Kitam.) using day length extension and Red Light Night Break. *Ornamental Horticulture*, 27(3), 365–373. Scopus. https://doi.org/10.1590/2447-536X.v27i3.2338

#### Abstract

In tropical areas, since the day length (DL) is shorter than the critical DL for chrysanthemum (Dendranthema x grandiflorum Kitam.), chrysanthemum flowers before reaching the required stem length (SL) for cut flower. Two experiments were conducted with the aim of determining critical DL for vegetative growth of chrysanthemum genotype; to attain a required SL and promote vegetative growth of chrysanthemum using night break (NB) with red light for spray type of chrysanthemum. In the first experiment, DL was extended by one, two, and three hours using white fluorescent light (WL) after sunset. In the second experiment, red light (RL) was applied at the middle of the night for 15, 30, or 45 minutes to break the night. The experiments were laid out in completely randomized design with four replications. The results indicated DL extension with WL and RL night breaks had significant effect on vegetative characters and biomass yield. Similarly, flower bud initiation, coloring and blooming were significantly affected. NB using RL had a significant effect on flower diameter. The three hours DL extension (12+3 hours) totally inhibited flowering of chrysanthemum genotype, which can be considered a critical DL for Hawa1. NB with RL for 15, 30, or 45 minutes effectively inhibited flowering of chrysanthemum. In conclusion,

breaking the night with RL at the middle of the night for 15 minutes with small amount of intensity  $(9.42 |\mu molm-2s-1)$  is enough to inhibit flowering and promote stem elongation of chrysanthemum Hawa1.

Bedaso, A., Adams, J., Peng, W., & Sibbritt, D. (2021a). Correction to: Prevalence and determinants of low social support during pregnancy among Australian women: A community-based cross-sectional study (Reproductive Health, (2021), 18, 1, (158), 10.1186/s12978-021-01210-y). *Reproductive Health*, 18(1). Scopus. https://doi.org/10.1186/s12978-021-01231-7

# Abstract

Following publication of the original article [1], the authors reported some variation between the descriptive section and the percentages presented in Table 1 for some variables. The original article [1] has been updated.

Gifty, A. G., De Meulenaer, B., & Olango, T. M. (2021). Corrigendum to "Variation in tuber proximate composition, sugars, fatty acids and amino acids of eight Oromo dinich (Plectranthus edulis) landraces experimentally grown in Ethiopia" [J. Food Compos. Anal. 67 (2018) 191–200](S0889157518300152)(10.1016/j.jfca.2018.01.015). Journal of Food Composition and Analysis, 101. Scopus. https://doi.org/10.1016/j.jfca.2021.103951

# Abstract

The authors regret the incorrect publication of Figure 1 and Footnote of Table 4 in the original article. The correct version of Figure 1 and Table 4 are presented below: Fig. 1. Mature tubers of eight Oromo dinich (Plectranthus edulis) landraces grown under similar condition at Hawassa, Ethiopia. [Figure presented] Table 4. Mean mono- and disaccharide contents of eight Landraces of 'Oromo dinich' (Plectranthus edulis) tubers grown under similar condition at Hawassa, Ethiopia expressed as g/100 g  $\pm$  SD on dry matter basis. [Table presented] Results in the same column with the same superscript were not significantly different (p > 0.05) according to the Tukey HSD Test.; ND = not detected, n = 3, Limits of detection (LOD) is 0.005 g/100 g. The authors would like to apologise for any inconvenience caused.

Woldesemayat, E. M. (2021a). Cost-effectiveness of follow-up of chronic coughers in detecting smear-positive tuberculosis in South Ethiopia. *ClinicoEconomics and Outcomes Research*, 13, 737–744. Scopus. https://doi.org/10.2147/CEOR.S319588

#### Abstract

#### Introduction

In Ethiopia, no studies assessing the cost-effectiveness of follow-up of smear-negative chronic coughers in detecting smear-positive tuberculosis (TB) (PTB+) cases have been reported. Objective: This article describes the cost-effectiveness of community-based follow-up of smear-negative chronic coughers in detecting PTB+ cases.

# Methods

Two alternative strategies of TB case finding, namely community-based follow-up of smearnegative chronic coughers and passive TB case finding, were compared. Participants were selected randomly in the active TB case finding approach, while purposively in the passive TB case finding strategy. In November 2012 and January 2015, costs related to TB diagnosis were collected using structured question-naires from sample of 60 patients in each strategy. Data on health system cost and direct and indirect costs incurred by patients and their caretakers were collected in Ethiopian Birr and converted into USD for analysis. Exchange rate for the data collection period of chronic coughers was 1 USD = 18.16 ETB and for passive case finding period was 1 USD = 20.24 ETB. Cost-effectiveness was calculated in terms of cost per PTB+ cases detected.

### Results

The overall cost of TB case finding was lower under active case finding approach than under passive TB case finding approach (USD 27.4 vs. 27.6). Active case finding approach was cost-effective by 43.4% and it is highly cost-effective when the duration of follow-up is reduced to 7 months or less.

#### Conclusion

Active case finding approach is a cost-effective approach of TB case finding. The cost benefit obtained could be even higher when the follow-up duration is minimized. Could devolving pneumonia treatment to local health centres reduce mortality in developing countries?

Wondirad, A., Kebete, Y., & Li, Y. (2021). Culinary tourism as a driver of regional economic development and socio-cultural revitalization: Evidence from Amhara National Regional State, Ethiopia. *Journal of Destination Marketing and Management*, 19. Scopus. https://doi.org/10.1016/j.jdmm.2020.100482

#### Abstract

Culinary tourism becomes increasingly influential in shaping visitors' decision-making and holiday experience on top of providing significant socio-cultural and economic benefits. This study examines the contributions of culinary tourism to the socio-economic development and cultural revitalization of tourism destinations using Porter's value chain theory. The study adopts a qualitative research approach with an exploratory design and collects data from 71 purposively selected informants. Research findings reveal that the proper planning, development, and management of culinary tourism promotes the economic development and socio-cultural revitalization of destinations by strengthening inter-sectorial linkages and empowering local communities. The existence of diverse agricultural products coupled with unique gastronomic heritage does not only improve the experience of visitors but also extend their length of stay. The provision of authentic culinary products also enables to manifest local culture and thereby portray a positive destination image. Several challenges including maintaining a consistent partnership between local gastronomic ingredient suppliers and the hospitality service providers hamper the successful development of culinary tourism in Amhara National Regional State. By adopting and extending the classic Porter's value chain theory, this study makes substantive theoretical contributions and practical implications about the multifaceted roles of culinary tourism in agriculturally reliant destinations. Conclusions and implications are also discussed along with study limitations and opportunities for further research.

Worojie, T. B., Asfaw, B. T., & Mengesha, W. A. (2021a). Cultivation and possible domestication of feral and possibly wild yams (Dioscorea spp.) in Southwest Ethiopia: Ethnobotanical and morphological evidence. *Plant Signaling and Behavior*, *16*(5). Scopus. https://doi.org/10.1080/15592324.2021.1879531

#### Abstract

The far Southwest Ethiopians transplant wild plant species to their gardens. One of such plant is the Dioscorea that we studied to assess the knowledge of wild yam and process of domestication. The study links two types of evidence to obtain insight about the process of yam domestication. We analyze two data sets derived from (1) ethnobotanical survey using 231 semi-structured interviews; and (2) morphological study in 47 yam accessions. Our study revealed that domestication is still active in some villages. Knowledge of yam domestication was shared by 44% of the farmers' even by those that have never practiced its domestication. Farmers who can describe the trend of domestication and the morphotypes of domesticate represented 21 and 28%, respectively. Farmers who have recent transplants in their garden varied from 4% in Bench to 10% in Sheko. The domestication process described by the two ethnic groups is similar. The duration of domestication can take up to six years, but with most of the individuals, it only takes three to five years. By linking the two types of evidence, two evolutionary processes are distinguished: (1) populations of recent domesticate expressing a domestication syndrome possibly belongs to the wild D. abyssinica or D. praehensilis, and (2) plants of incipient domesticate that might be derived from volunteers or diverse types of hybrids. Each of these processes can lead to integration of wild genotypes into the cultivated gene pool, and hence, enhance genetic diversity of cultivated yams. The domestication practices of traditional farmers should thus be taken into account if yam conservation and improvement plans need to be established.

Jikamo, B., Adefris, M., Azale, T., & Alemu, K. (2021). Cultural adaptation and validation of the Sidamic version of the World Health Organization Quality-of-Life-Bref Scale measuring the quality of life of women with severe preeclampsia in southern Ethiopia, 2020. *Health and Quality of Life Outcomes*, 19(1). Scopus. https://doi.org/10.1186/s12955-021-01872-z

#### Abstract

#### Background

Women with severe preeclampsia often present with more health complaints compared to those with uncomplicated pregnancies. Estimating the quality of life of women affected with severe preeclampsia could provide direction for further interventions. However, the current measurement of the quality of life has not been culturally adapted and validated for this population. This study aimed to translate, culturally adapt, and test the reliability and validity of the World Health Organization Quality-of-Life-Bref Scale (WHOQOL-BREF) in southern Ethiopia among women with severe preeclampsia.

# Methods

An institutional-based cross-sectional study was conducted in southern Ethiopia in selected hospitals with randomly recruited women with severe preeclampsia. Cultural adaptation and validation techniques were used to translate and adapt the WHOQOL-BREF scale. Face, content validity, forward and backward translations, and synthesis were computed using an expert panel. The scale was pretested and adjusted accordingly. Internal consistency (Cronbach's alpha) and test–retest reliability (Intraclass Correlation Coefficient = ICC) were examined. Confirmatory factor analysis (CFA) was computed to test the fit of the structure to the local setting before conducting exploratory factor analysis (EFA). Multiple methods for determining the number of factors extracted (scree test, eigenvalues) were used. We compared the original English structure with the new structure in the study setting and extracted a new structure using EFA.

#### Results

The internal consistency reliabilities ranged from 0.8045 to 0.9123 indicating good-to-excellent reliability. The item-level content validity ranged from 0.86 to 1.00; the scale-level content validity index was 0.97. In CFA, the model fit indices were unacceptable (Comparative Fit Index (CFI = 0.87), Root Mean Square Error of Approximation (RMSEA = 0.23), Standardized Root Mean Square Residual (SRMR = 0.38), Tucker Lewis Index (TLI = 0.85) and (PCLOSE = 0.00). Three

new factor structures were extracted using EFA for current research with a total variance was 91%.

# Conclusions

The failure of the original scale in this study population highlights the importance of culturally adapting tool to local settings. EFA confirmed a three-factor structure, inconsistent with the original English structure

Desta, H. B., & Belayneh, M. Z. (2021). Dam breach analysis: A case of Gidabo dam, Southern Ethiopia. *International Journal of Environmental Science and Technology*, 18(1), 107–122. Scopus. https://doi.org/10.1007/s13762-020-03008-0

#### Abstract

Gidabo dam provides flood control and irrigation water supply for sugarcane and rice cultivation. The dam has 25.8 m height and 335 m crest length with side ogee spillway to pass 10,000 years' flood. There were different economic developments downstream of the dam including irrigation command area and irrigation structures. Since Nature is full of uncertainties, it is likely that Gidabo dam can be subjected to sudden breaches due to the probable maximum flood. Therefore, dam breach analysis and flood inundation map preparation should be conducted. The Hydrologic Engineering Center's River Analysis System new version was used to analyze the dam breach for overtopping failure. River analysis system Mapper which is Geographic information system tool of Hydrologic Engineering Center's River Analysis and Geographic information system were used to develop flood inundation map. Dam breach parameters were calculated within the Geographic information system model by using beach parameter calculator tab. A two-dimensional unsteady flow simulation of the dam breach was performed by using the inflow hydrograph as upstream boundary condition. From the rainfall data analysis, the probable maximum precipitation resulting probable maximum flood was found 277 mm results a peak inflow of 6387 m3/s. It was found that the breach bottom width was 143 m while the breach side slope (horizontal: vertical) was 1.4:1 and 2.7 h breach formation time. The peak breach outflow was found to be 15,848.85 m3/s which covers 2050 hectares with maximum depth of 12.14 m.

Balan, G. S., Sridharan, M., Balasundaram, R., Sasikaran, A., Sagar, M., Dinesh, S., Vijayan, V., & Rajkumar, S. (2021). Degradation Analysis of Jute Fiber Reinforced Waste Tile Powder-Filled Polymer Composite on Wear Characteristics. *International Journal of Polymer Science*, 2021. Scopus. https://doi.org/10.1155/2021/8587383

#### Abstract

In this study, a polymer composite is made using chemically treated jute fiber and waste floor tile powder as an alternative source for roof tile application. The wear qualities were examined at various ages, and the outcomes were optimized. In order to improve the wetting properties of the jute fiber, it was chemically treated. MINITAB software was used to develop Taguchi method parameters such as jute fiber percentage, waste tile powder percentage, and NaOH chemical treatment using the MINITAB software. It was determined that hardness was the most important characteristic in terms of wear properties after the specimens were subjected to ageing and abrasion wear testing and hardness tests were carried out as per normal protocols. As a result of the waste tile powder addition, the surface and core pore formation rates were reduced and the wear index rates were low. Jute fiber with 15%, 9% tile powder, and 5% NaOH treatment were found to have the lowest wear index of the other specimen compositions tested, according to the wear index. Specimen made with 5% jute fiber addition, 9% tile powder inclusion, and 10% NaOH treatment, on the other hand, had more hardness. Degradation of the fibers and delamination are side effects of the ageing process. The wear resistance of the surface was increased by the use of waste tile powder.

# Gezu, L., Nallamothu, R. B., Nallamothu, S. K., Nallamothu, A. K., & Tafesse, D. (2021). *Design and Analysis of Composite Drive Shaft for Rear-Wheel-Drive Vehicle* (p. 92). Scopus. https://doi.org/10.1007/978-981-16-0976-3\_9

# Abstract

These days, lightweight materials are in huge demand. One of the promising solutions for meeting this rising demand is looking for fibre-reinforced polymer composites. Fibre composite materials due to their nature of lightweight, they are gaining attention for preparation of products and appliances in the fields of medicine, household appliances, automotive, sports goods, aerospace

etc. This research work aims to replace a metallic drive shaft by a two-piece composite drive shaft. Drive shaft plays a key role in the transmission of power in an automobile. In this research work, an effort is made to replace two-piece drive shaft made of steel with a single-piece drive shaft made of E-glass fibre/epoxy composite. Material behaviour is considered as linear isotropic for metals and orthotropic for the composite shaft. Reduction of weight of an automobile, with no compromise in cost, reliability and quality, is the main target of automobile manufacturers. Reduction in the weight of drive shaft also contributes to the overall reduction in weight of the vehicle. Fuel consumption of the vehicle is directly dependent on vehicle weight. In urban drive, fuel consumption increases considerably with an increase in the vehicle. The drive shaft of a vehicle can be designed with composite materials, to reduce its weight and increase the first mode of natural frequency reducing fuel consumption and avoiding resonance failure. In the process of drive shaft design, various stacking sequences can be used for reducing the bending stresses during its operation. The drive shaft model is prepared by CATIA and analysed using ANSYS. Given the amount of torque transmission, the dimensions of the drive shaft were calculated. The result had shown a mass reduction of 46%. In conclusion, the two-piece drive shaft can be replaced by singlepiece composite made resulted in weight reduction which can also eliminate part complexity. Drive shaft optimum design with composite materials is achieved, which contributed to the reduction of fuel consumption without compromising the strength of the component.

# Kakkar, S., Maity, T., Ahuja, R. K., Walde, P., Saket, R. K., Khan, B., & Padmanaban, S. (2021). Design and Control of Grid-Connected PWM Rectifiers by Optimizing Fractional Order PI Controller Using Water Cycle Algorithm. *IEEE Access*, *9*, 125941–125954. Scopus. https://doi.org/10.1109/ACCESS.2021.3110431

#### Abstract

In this paper water cycle algorithm-based fractional order PI controller (FOPI) is proposed for virtual flux-oriented control of a three-phase grid-connected PWM rectifier. FOPI controller makes the PWM rectifier control more robust due to the fractional behavior. Fractional-order controllers have an additional degree of freedom, so a wider range of parameters is available to provide better control and robustness in the plant. The optimization and design of the FOPI controller are done using the water cycle algorithm (WCA). WCA is an optimization method
inspired by monitoring the water cycle operation and flow of water bodies like streams and rivers toward the sea. The performance of the FOPI controller is compared with the classical integer order PI controller. The parameters of PI and FOPI controllers are optimized and designed using the WCA technique, leading to WCA-PI and WCA-FOPI controllers. The system is tested using MATLAB/Simulink. The simulation results verify the better performance of WCA-FOPI in terms of settling time, rise time, peak overshoot, and Total Harmonic Distortion (THD) of grid current. A robustness measurement with line filter parametric variations and non-ideal supply voltage (unbalance and distorted supply voltage) is carried out. The WCA-FOPI demonstrates more robustness as compared to WCA-PI. Simulation findings validate the WCA-FOPI controller outcomes as compared to WCA-PI in terms of control effect and robustness.

# Chiriko, A. Y., Muluneh, D. W., & Taye, T. T. (2021). DESTINATION COMPETITIVENESS IN A TOURIST ROUTE CONTEXT: TOUR OPERATORS' PERSPECTIVE. *Tourism, Culture and Communication, 21*(4), 299–311. Scopus. https://doi.org/10.3727/109830421X16257465701936

#### Abstract

To be successful in tourism, destinations must ensure their competitive advantages in national and global markets. Although destination competitiveness is a relatively better studied theme in tourism literature, much of the research into it largely focused on conceptualizing destinations at national, regional, and local self-contained attraction levels. This study presents an assessment of tourism competitiveness in a tourist route context by examining selected destinations in the Southern Ethiopian Route as a study context. Its objectives were to evaluate the factors that determine destination competitiveness of the route from tour operators' perspective. Data were collected through structured questionnaire from a comprehensive sample of 117 tour operators. The data, analyzed using hierarchical regression, showed that destination resources, infrastructure and support services, and human-related factors were the major determinants of Southern Ethiopian Route's destination competitiveness. However, situational conditions did not predict the route's competitiveness in a statistically significant way. The study contributes a conceptual insight to destination competitiveness literature through its examination of tourist routes in the African context from industry practitioners' perspective. It also offers implications for tourism

administrators and marketers in the route to step up efforts to enhance the route's competitiveness as a destination.

# Daba, A. K., Murimi, M., Abegaz, K., & Hailu, D. (2021). Determinants and constraints to household-level animal source food consumption in rural communities of Ethiopia. *Journal of Nutritional Science*, *10*, e58. Scopus. https://doi.org/10.1017/jns.2021.52

#### Abstract

Animal source foods (ASF) contain quality nutrients important for growth, development, immunity and behavioural outcomes. Plant-based foods also provide the nutrients, but with lower bioavailability than ASF. Evidence on household-level ASF consumption frequency, constraints and determinants are limited for Ethiopia. Therefore, the present study aimed to assess the consumption frequency of ASF and to identify determinants and constraints among rural households in Ethiopia. A cross-sectional study was conducted in 422 households. The consumption frequency of ASF was assessed using a food frequency screener over 30 days. Twelve statements with Likert scale responses were used to identify constraints to ASF consumption. Ordinal logistic regression was used to identify determinants of ASF consumption. About a quarter (26 %) of the households consumed milk one to two times per week. One out of five households consumed eggs one to two times per week (20 %) or one to two times per month (19%). Poultry and meat were never consumed by 92 and 60% of the households, respectively. Unavailability, unaffordability, consumption tradition and income generation priority were constraints identified. Food insecurity, livestock ownership, income, family size and women's education were associated (P < 0.05) with selected ASF consumption. Rural households in Ethiopia did not consume ASF on regular basis. Poor socio-demographic and economic conditions as determined by food insecurity, property ownership, income, educational achievement, family size and ASF unavailability and unaffordability contributed to the lower consumption frequency of ASF by households in rural Ethiopia. Nutrition policies and programmes should focus on nutrition-sensitive agricultural extension, livelihood improvement and women empowerment interventions integrated with nutrition education to improve ASF consumption in rural settings.

Roba Gamo, B., Woldeamanuel Habebo, T., Tsegaye Mekonnen, G., & Park, D.-B. (2021). Determinants of community participation in a watershed development program in Southern Ethiopia. *Community Development*. Scopus. https://doi.org/10.1080/15575330.2021.1946576

#### Abstract

Community participation is critically important for the effectiveness of a development project. Different factors influence community participation, and these factors are not the same across all communities. This study aimed to identify the socioeconomic and watershed impact-related factors influencing community participation in a watershed development program in southern Ethiopia. Data were collected from 1,064 respondents (87.7% males) and in nine districts in southern Ethiopia. Descriptive statistics and logistic regression explored which variables predict higher rates of community participation, and whether determining variables changed from before to after the program was implemented. The results show that the variables predicting community participation in the watershed development program were significantly different before and after the program's implementation. The findings highlight the importance of demonstrating the positive impacts of community development interventions as early in the program as possible to ensure more and continued participation in relevant development projects.

# Wassie, Y. T., Rannestad, M. M., & Adaramola, M. S. (2021). Determinants of household energy choices in rural sub-Saharan Africa: An example from southern Ethiopia. *Energy*, 221. Scopus. https://doi.org/10.1016/j.energy.2021.119785

#### Abstract

This study analyses the determinants of rural household energy choices for cooking and lighting in southern Ethiopia by using data from a cross-sectional study of 660 sample households and direct observational studies. Chi-square tests and Multivariate Probit (MVP) model were used to analyse the data. The findings showed that most of the rural households depend on fuelwood (90.70%) while only 3.14% use clean fuels as primary sources of energy for cooking. In contrast, 50% use kerosene, 29% electricity, 19% solar, and 1.98% biogas as primary lighting energy sources. The Chi-square tests revealed that a statistically significant relationship exists between household cooking fuel choices and distance to wood source, household size, income level, and

location. Empirical results of the MVP model showed that rural household energy choices for lighting are significantly influenced by income level, family size, access to road, location, education level, cost of technology, and distance to market. Wealthier and more educated households residing near road access were more likely to use cleaner lighting fuels while poorer households residing in areas with limited road access use kerosene and dry-cell batteries. However, higher-income level and grid-connection have not led households to completely forgo the use of traditional cooking and lighting fuels. While income remains a principal factor, the study finds that various non-income factors also play a major role in determining household energy choices and transition. And hence, policymakers and energy planners in Ethiopia and sub-Saharan Africa at large need to consider these diverse factors when designing energy policies and interventions to rural areas.

Kotiso, K. S., Degemu, N., Gebremedhin, S., Taye, M., Petros, A., Belayneh, F., Wolde, D., & Hailu, D. (2021). Determinants of hypertension among patients with type 2 diabetes mellitus on follow-up at Tikur Anbessa Specialized Hospital, Addis Ababa: A case-control study. *PLoS ONE*, *16*(8 August). Scopus. https://doi.org/10.1371/journal.pone.0256399

#### Abstract

# Introduction

Hypertension (HTN) in patients with diabetes mellitus (DM) is a common problem that increases the risk of mortality and morbidity, and lowers the quality of life. Despite the disproportionately high burden of HTN in DM patients, determinants for the comorbidity have not been sufficiently explored. Therefore, this study aimed to identify the determinants of HTN among patients with type 2 diabetes mellitus on follow-up at Tikur Anbessa Specialized Hospital.

#### Methods and materials

We conducted a hospital-based unmatched case-control study at Tikur Anbessa Specialized Hospital on 386 randomly selected patients with type 2 diabetes on follow-up (200 cases and 186 controls). We collected data by using a structured interviewer-administered questionnaire and data extraction form. To identify determinants of hypertension, a multivariable binary logistic regression was fitted, and the findings are presented using adjusted odds ratio (AOR) with 95% confidence interval (CI).

### Results

The mean reported age (±SD) of the cases and the controls was 60.3 (±9.9) and 55.3 (±11.3) years, respectively. The eight identified independent determinants of hypertension with AOR [95% CI] were obesity: 2.82 [1.43, 5.57], sedentary activity of  $\geq$ 4hrs/day: 1.75 [1.10, 2.79], higher stress score: 1.05 [1.01, 1.10], serum creatinine above 1.1 mg/dl: 2.35 [1.13, 4.91], age: 1.05 [1.02, 1.08], being government employee as compared to private workers: 2.18 [1.06, 4.50] and family history of hypertension: 2.11 [1.26, 3.54]. Further, interaction of diabetes duration with insulin use: 1.03 [1.01, 1.07] was also a significant predictor of HTN among DM patients.

#### Conclusion

The finding calls for interventions for mitigating these determinants. Further research is needed to examine the interaction between diabetes duration and insulin use.

# Alemu, A. (2021). Determinants of Participation in Farmers Training Centre Based Extension Training in Ethiopia. *Journal of Agricultural Extension*, 25(2), 86–95. Scopus. https://doi.org/10.4314/jae.v25i2.8

#### Abstract

The study assessed the determinants of farmers' participation in farmers training center based trainings and its outcome on maize, haricot bean and coffee productivity. Data were collected from randomly selected 194 households. Outcomes of the FTC based training on maize, haricot bean and coffee productivity was analyzed using t-test whereas binary logistic regression model was used to identify factors determining farmers' participation in FTC based training. The result showed that education, land size, contact with development agent, access to road, wealth status and livestock holding of the household positively determine households' decision to participate whereas distance from FTC negatively determines households' decision to participate. There was positive outcome of the FTC based training on maize, haricot bean and coffee productivity. The study recommends that governmental, public and private sectors should expand access to education, access to road and strength linkage between famers and agricultural development agents.

Belayhun, Y., Kassa, Y., Mekonnen, N., Binu, W., Tenga, M., & Duko, B. (2021). Determinants of Pregnancy-Induced Hypertension among Mothers Attending Public Hospitals in Wolaita Zone, South Ethiopia: Findings from Unmatched Case-Control Study. *International Journal of Hypertension*, 2021. Scopus. https://doi.org/10.1155/2021/6947499

### Abstract

#### Background

It has been estimated that approximately 14% of maternal death has resulted due to pregnancyinduced hypertension. Evidence also suggests that pregnancy-induced hypertension may result in adverse maternal and child outcomes. The aim of this study was to assess the determinants of pregnancy-induced hypertension among mothers attending antenatal and delivery services at public health hospitals in Wolaita zone, southern Ethiopia.

#### Methods

An institutionally based unmatched case-control study was conducted at three public hospitals. A total of 283 study participants were recruited for this study. Cases were selected consecutively as they were being diagnosed for pregnancy-induced hypertension, and two controls were selected for each case. Data were collected via the face-to-face interview technique using a pretested questionnaire. Unconditional logistic regression analysis was used to identify the independent predictor variables and produced odds ratio (OR) as a measure of association.

#### Results

The mean  $\pm$  (SD) ages of cases and controls were 26.1  $\pm$  5.4 and 26.1  $\pm$  4.5 years, respectively. Being rural residents (AOR: 2.25, 95% CI: 1.09-4.65), illiterate (AOR: 3.12, 95% CI: 1.20-8.08), having the history of pregnancy-induced hypertension (AOR: 6.62, 95% CI: 2.48-17.71), history of kidney disease (AOR: 3.14, 95% CI: 1.05-9.38), and family history of hypertension (AOR: 5.59, 95% CI: 2.73-11.45) were determinants that increased the odds of suffering from hypertensive disorders of pregnancy. More importantly, eating vegetables and fruit reduces the odds of suffering from pregnancy-induced hypertension by 77% (AOR: 0.23, 95% CI: 0.06-0.79).

#### Conclusion

Being rural residents, illiterate, having a history of pregnancy-induced hypertension, and history of kidney disease, as well as the family history of hypertension were identified determinates of hypertensive disorders of pregnancy in the study area. Furthermore, fruit and vegetable intakes

were identified as protective factors for pregnancy-induced hypertension. Therefore, early diagnosis and intervention of this disorder are warranted to reduce adverse outcomes.

Tegegn, A., Pendell, D. L., Tolera, A., Min, D., Vipham, J., & Mekasha, A. (2021).DETERMINANTS OF SORGHUM BIOMASS USE FOR LIVESTOCK FEED ACROSSSORGHUM GROWING AGROECOLOGICAL ZONES IN ETHIOPIA. Tropical andSubtropicalAgroecosystems,24(3).Scopus.https://www.scopus.com/inward/record.uri?eid=2-s2.0-85126533285&partnerID=40&md5=446104ae3bd42ee4709fe05026d5b116

### Abstract

# Background

In mixed crop livestock farming systems in Ethiopia, sorghum stover and other crop residues are a strategic livestock feed resource. Farmer's decisions and intensity of use of sorghum stover for feed than other uses are closely associated with biophysical and socioeconomic characteristics. Objective. This study explores determinants of sorghum biomass uses for livestock feed in three major sorghum growing agroecological zones of Ethiopia.

### Methodology

Tobit and double hurdle models were run and likelihood ratio test was performed to select most suitable estimation technique.

# Result

Allocation of sorghum stover for feed showed a significant association with sorghum growing agro-ecological zones, highest in the lowland (86.73%) and the lowest in highland sorghum growing agroecological area (61.75%). Econometric model result revealed that among other factors; availability of feed from grazing and other crop residues had a negative effect on decision to use and intensity of use of sorghum stover for feed. Household's livestock ownership and family size had positive effects. Implication. Decision variables influenced household's decision and intensity on use of sorghum stover for feed at three major sorghum growing zone differently. **Conclusion** 

Knowledge generated through this study may help any research and development efforts to enhance productivity of sorghum biomass for livestock feed and livestock improvement strategies. Pachauri, R. K., Mahela, O. P., Khan, B., Kumar, A., Agarwal, S., Alhelou, H. H., & Bai, J. (2021). Development of arduino assisted data acquisition system for solar photovoltaic array characterization under partial shading conditions. *Computers and Electrical Engineering*, 92. Scopus. https://doi.org/10.1016/j.compeleceng.2021.107175

#### Abstract

This research proposed the data acquisition system (DAS), which has a capability to collect realtime voltage and current at variable load resistance during an experimental characterization analysis of  $3 \times 3$  size, photo voltaic (PV) system, under partial shading conditions (PSCs). In addition, the system is economical and minimizes the testing period for PV system characterization relative to traditional approaches. Analogue voltage and current sensors are integrated with the open-source Arduino platform to quantify and store real-time performance data in the SD card assembly. Performance parameters such as voltage and power at global maximum power point (GMPP), with minimized power loss (PL) and improved fill factor (FF) shows the effectiveness of the proposed system under the PSCs. Real-time hardware is developed and its performance is compared with the MATLAB/Simulink performance, with percentage errors as low as 0.48%, 1.95% and 1.37% under different shading case.

Sivasuriyan, A., Vijayan, D. S., Leemarose, A., Revathy, J., Gayathri Monicka, S., Adithya, U. R., & Jebasingh Daniel, J. (2021). Development of Smart Sensing Technology Approaches in Structural Health Monitoring of Bridge Structures. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/2615029

#### Abstract

In recent years, immense development in Structural Health Monitoring (SHM) of bridges helps address the life span and reliability of bridge structure at contrasting phases of their service life. This article provides a detailed understanding of bridge monitoring, and it focuses on sensors utilized and all kinds of damage detection (strain, displacement, acceleration, and temperature) according to bridge nature (scour, suspender failure, disconnection of bolt and cables, etc.) and environmental degradation under static and dynamic loading. This paper presents information about various methods, approaches, case studies, advanced technologies, real-time experiments, stimulated models, data acquisition, and predictive analysis. Future scope and research also discussed the implementation of SHM in bridges. The main aim of this research is to assist researchers in better understanding the monitoring mechanism in bridges.

Paidar, M., Mohanavel, V., Ojo, O. O., Mehrez, S., Rajkumar, S., & Ravichandran, M. (2021). Dieless Friction Stir Extrusion-Brazing (DFSE-B) of AA2024-T3 aluminum alloy to Copper with Zn interlayer. *Results in Physics*, 24. Scopus. https://doi.org/10.1016/j.rinp.2021.104101

#### Abstract

The integration of flow-induced mechanical interlocking, interlayer-controlled atomic diffusion and self-reacting brazing benefit is employed to achieve an improved load-bearing performance of the dissimilar AA2024-T3/copper joint via the use of Dieless Friction Stir Extrusion-Brazing (DFSE-B). A comparative study of the Dieless Friction Stir Extrusion-Brazing (DFSE-B) and Friction Stir Spot Welding-Brazing (FSSW-B) of the dissimilar AA2024-T3/Cu joint was investigated by using a 100  $\mu$ m thick Zn interlayer. The microstructure, tensile-shear load, and fracture modes of the respective joints were examined. The results show that Zn solidificationinduced voids are inevitable at the brazed zones of both joints and the DFSE-B process suppresses flow-induced defect, unlike the FSSW-B process. An improved tensile-shear load with a significant toughness is achieved by the DFSE-B process due to the absence of tool-induced keyhole, and the intrinsic mechanical interlocking of the softer Al alloy into the harder Cu alloy. The DFSE-B is a suitable welding alternative for reactive metals. de Roo, N., Amede, T., Elias, E., Almekinders, C., & Leeuwis, C. (2021). Diffusion of agricultural knowledge in Southern Ethiopia: Finding the real opinion leaders through network analysis. *Journal of Agricultural Education and Extension*. Scopus. https://doi.org/10.1080/1389224X.2021.1987282

#### Abstract

**Purpose**: Agricultural extension services in poor countries often identify opinion leaders based on criteria such as wealth and social status. We explore the effectiveness of this top-down approach by analysing the role of so-called model and nodal farmers in the diffusion of malt barley in a highland community in Ethiopia.

**Research approach:** We use a retrospective case study design where we combine quantitative network analysis with qualitative data.

**Findings**: Nodal farmers played a more central role in knowledge diffusion of the technology than model farmers. While model farmers were wealthier and better connected to the local authorities, nodal farmers were socio-economically more similar to their fellow farmers. Nodal and model farmers, as well as farmers closely connected to them, had a significantly higher adoption index than the rest.

**Practical implications**: The diffusion of knowledge is an important condition for the adoption of modern agricultural technologies, but it is not enough, particularly when access to external inputs is limited. Moreover, relying on assumed opinion leaders has its limitations and may even reinforce existing inequalities. Theoretical implications: This paper has shown the complementarity of network approaches. We propose network approaches such as social network analysis to identify community brokers who emerge from bottom-up or clan-based, political, knowledge networks that mediate access to agricultural technologies.

**Originality**: Our combined research approach differs from the mainstream of studies in this field that employ either ethnographic fieldwork or (spatial-)econometric methods. We aim to create a bridge between the often separated worlds of (technical) agronomic research, (qualitative) rural sociology, and (quantitative) econometric analysis.

# Sheferaw, D., Mohammed, A., & Degefu, A. (2021). Distribution and prevalence of gastrointestinal tract nematodes of sheep at highland and midland areas, Ethiopia. *Journal of Parasitic Diseases*, 45(4), 995–1001. Scopus. https://doi.org/10.1007/s12639-021-01397-8

#### Abstract

Gastrointestinal nematodes infections are the most important causes of wastage and decreased productivity. This study was conducted with the objectives of estimating the prevalence of gastrointestinal nematodes infection, and the associated risk factors. The overall prevalence of gastrointestinal nematodes infection was 83% (n = 568). The prevalence of gastrointestinal nematodes infection at Debre-Zeit and Debre-Birhan were 84% and 82.3%, respectively. It was significantly higher in poor body condition and soft faecal consistency (P < 0.05) sheep. The overall mean eggs per gram of faeces was 635.2 (95% CI 590.6–679.9). The mean egg per gram was significantly influenced by site of the study, body condition score and faecal consistency (P < 0.05). The faecal egg count was higher in midland area, and in sheep with poor body condition, and soft faecal consistency and diarrhea. The light and moderate level of infections accounted for 73.8% and 17.3%, respectively. With the coproculture the main genera identified were include: Haemonchus, Trichostrongylus, Teladorsagia/Ostertagia and Trichuris in decreasing order of their abundance. To improve sheep health and productivity their control is crucial. Hence, appropriate animal health extension work and training of sheep farmers how they able to identify anemic and diarrheic sheep are helpful. Moreover, training on how to deworm with correct drug and dose for animal owners is important in the control of these parasites. Further epidemiological studies and survey on the development of anthelmintic resistance in the areas is required.

# Elende, A. A., & Gebremichael, M. G. (2021). Distribution Network Optimization by Optimal Sizing and Placement of D-STATCOM using Teaching and Learning Based Optimization Algorithm. 2021 IEEE Southern Power Electronics Conference, SPEC 2021. Scopus. https://doi.org/10.1109/SPEC52827.2021.9709447

#### Abstract

Distribution system is a part of an electric power system, which links the high voltage transmission networks with the end consumers. This work offers the way of improving the performance of the distribution network by improving voltage profile and reduction of power loss via injecting reactive power through the network. This study has been conducted on Aposto feeder of Yirgalem distribution network (Ethiopia) for steady-state constant load model. In this work, the first condition has aimed to find the best optimal D-STATCOM sizing and placement by using Teaching and Learning Based optimization (TLBO). Results obtained have been compared with those of the conventional optimization techniques reported in literature. As stated, the TLBO method performs better in terms of reducing both real and reactive power losses and improvement of voltage profile. The model has been formulated to minimize the total cost of the network by determining the optima of the substation locations and power, the load transfers between the demand centers, the feeder routes and the load flow in the network subject to a set of constraints. From the point of view of economic evaluations, the proposed approach is cost-effective. Generally, the simulation results show that the proposed technique is effective to maintain all bus voltage magnitudes within the IEEE acceptable limit and thereby reducing power losses significantly. In this research D-STATCOM control is developed based on artificial intelligence (AI) using artificial neural network (ANN), which depends on optimum values obtained by TLBO.

Anteneh, D., Khan, B., Mahela, O. P., Alhelou, H. H., & Guerrero, J. M. (2021). Distribution network reliability enhancement and power loss reduction by optimal network reconfiguration. *Computers and Electrical Engineering*, 96. Scopus. https://doi.org/10.1016/j.compeleceng.2021.107518

#### Abstract

Voltage instability, power imbalance, and unreliability are all caused by power interruptions and losses in the distribution system. The optimal reconfiguration of the distribution network is offered in this research as a solution to such challenges. The investigation is carried out using an actual distribution system in Kombolcha, Ethiopia. Modified shark smell optimization (MSSO) is used in the MATLAB environment to improve system reliability and voltage profile with low power loss. Tie switches are optimally placed to reduce power losses, total cost of outages, and reliability indices such as the system average interruption frequency index (SAIFI), system average interruption duration index (SAIDI), and expected energy not supply (EENS) all at the same time. The MSSO's effectiveness is demonstrated through a comparison with other approaches. Furthermore, a real-time digital simulator is used to implement the suggested task in real time with allowable mistakes in the results (RTDS).

Deng, L., Peng, C., Kim, D.-G., Li, J., Liu, Y., Hai, X., Liu, Q., Huang, C., Shangguan, Z., & Kuzyakov, Y. (2021). Drought effects on soil carbon and nitrogen dynamics in global natural ecosystems. *Earth-Science Reviews*, 214. Scopus. https://doi.org/10.1016/j.earscirev.2020.103501

# Abstract

Extreme droughts have serious impacts on the pools, fluxes and processes of terrestrial carbon (C) and nitrogen (N) cycles. A deep understanding is necessary to explore the impacts of this extreme climate change events. To investigate how soil C and N pools and fluxes respond to drought and explore their mechanisms we conducted a meta-analysis synthesizing the responses of soil C and N cycles to droughts (precipitation reduction experiments) in three main natural ecosystems: forests, shrubs and grasslands. Data were collected from 148 recent publications (1815 sampling data at 134 sites) with the drought experiments from 1 to 13 years across the globe. Drought reduced soil organic C content (-3.3%) mainly because of decreased plant litter input (-8.7%) and reduced litter decomposition (-13.0%) across all the three ecosystem types in the world. Drought increased mineral N content (+31%) but reduced N mineralization rate (-5.7%) and nitrification rate (-13.8%), and thus left total N unchanged. Compared with the local precipitation, drought increased the accumulation of dissolved organic C and N contents by +59% and +33%, respectively, due to retarded mineralization and higher stability of dissolved organic matter. Among the three ecosystem types, forest soils strongly increased litter C (+64%, n=8) and N content (+33%, n=6) as well as microbial CO2 (+16%, n=55), whereas total CO2 emission remains unaffected. Drought decreased soil CO2 emission (-15%, n=53) in shrubs due to reduction of microbial respiration and decreased root biomass. The 98% (n=39) increase of NH4+ concentration in forest soils corresponds to 11% (n=37) decrease of NO3- and so, it reflected the increase of N mineralization rate, but the decrease of nitrification. For shrubs and grasslands, however, stabilized or decreased N mineralization and nitrification mean less N uptake by plants under drought. Overall, the effects of drought on soil C and N cycles were regulated by the ecosystem type, drought duration and intensity. The drought intensity and duration intensify all effects, especially on the decreasing total CO2 emission. However, the most studies mainly focused on the short-term droughts, and there is a lack of comprehensive understanding of how drought effects in a long-term consequences. So, future studies should strengthen drought frequency impacts on ecosystem C and N dynamics in the long-term sequence (> 10 years) in order to face the impacts of global change.

# Endris, J., & Govindan, N. (2021). Dyeing and finishing of cotton fabric with eucalyptus leaves extracts. *Research Journal of Textile and Apparel*, 25(3), 193–208. Scopus. https://doi.org/10.1108/RJTA-12-2019-0060

# Abstract

**Purpose**: The purpose of this study is to establish a suitable procedure for dyeing and multifunctional finishing on 100% cotton using extracts of eucalyptus leaves in an eco-friendly manner.

**Design/methodology/approach**: Box–Behnken design of experiments and analysis of variance (ANOVA) were used to optimise the conditions of extraction, dyeing and finishing. Phytochemical analysis was performed to determine the chemical constituents of the extracts. Colour strength, fastness properties were evaluated for dyed fabric samples. The effectiveness of eucalyptus leaves extract as an insect repellent, aroma, antibacterial finishing agent, was assessed. Pre-soaking and padding method was used for the application of active essential oil on the fabric.

**Findings**: Essential oil extracted from Eucalyptus globulus leaves have great repellent rate for insects to the extent of 90% and aroma intensity of 72% and antibacterial effect of 100% bacterial reduction up to five washings. The use of citric acid as cross-linking agent helps increase the durability of the finish. Natural dyeing to get light yellow shade is possible with extracts made with water, possessing good fastness properties.

**Research limitations/implications:** Scaling up the extraction process and soaking larger quantities of fabrics in extracted essential oil solution before the pad applications are considered limitations of this study. However, smaller pieces of fabrics can conveniently be handled in this process. It has tremendous potential for practising industrially, to get yellow-shaded multifunctional finished cotton textiles. Practical implications: Protection against insects, including mosquitoes, bacteria with additional aroma on cotton will be of great use in day-to-day life for the wearer.

**Social implications**: Eco-friendly, renewable sources of ingredients from the plant were used to obtain protection against pathogenic or odour-causing microorganisms using this hygiene finish with multiple end uses.

**Originality/value**: This original work enables conducting dyeing and multifunctional finishing together in a single stage, which otherwise takes a number of steps, consuming large quantities of water, chemicals and energy to impart similar effects on cotton.

Semela, T., & Miethe, I. (2021). East Germany in the Horn of Africa: Reflections on the GDR's educational intervention in Ethiopia, c. 1977–1989. *History of Education*, 50(5), 663–684. Scopus. https://doi.org/10.1080/0046760X.2021.1884753

# Abstract

During the Cold War, the German Democratic Republic (GDR) was a key player in sub-Saharan Africa. Focusing on its role in the Ethiopian polytechnical education reform effort between 1977 and 1989, this study explores the extent of educational policy transfer as well as the nature and magnitude of influence during the implementation of that transfer. Based on secondary sources and in-depth interviews with former educational officials, curriculum experts, and educators in teacher training institutes and colleges, the study examines the power relations between the two cooperation partners at systemic, institutional and individual levels of interaction. Finally, the study identifies issues that provide insights for improving the historical and theoretical literature on Cold War educational policy transfers.

Bona, L. G., Geleta, D., Dulla, D., Deribe, B., Ayalew, M., Ababi, G., Bogale, N., Mengistu, K., Gadissa, A., & Gebretsadik, A. (2021). Economic Burden of Cancer on Cancer Patients Treated at Hawassa University Comprehensive Specialized Hospital. *Cancer Control*, 28. Scopus. https://doi.org/10.1177/10732748211009252

#### Abstract

Cancer causes the highest economic loss of all of the leading 15 causes of death worldwide. The economic loss includes the loss of income and the expenses associated with health care costs. The Low awareness of the community toward cancer, the inadequacy of professionals and service providers, and the high budget consuming nature of the treatments are creating a great burden on the cancer patients. The objective of this study was to calculate patient side cancer treatment cost and to assess the contributing factors, among the cancer patients who were treated at Hawassa University Comprehensive Specialized Hospital. The health facility based cross-sectional study design was employed using a consecutive sampling technique. Questionnaires was used to collect

primary data; while chart was used to collect the secondary data. Indirect costs incurred on these patients due to off job days were checked. Descriptive and inferential statistics were applied to illustrate the data. On average, \$209.99 was spent on treatment by each cancer patients. Of these, medication cost is the highest (\$20.77, IQR = 0.53-112.56) from the direct medical costs, and transportation cost is the highest (\$58.33, IQR = 22.0-131.67) from the indirect medical costs. Inpatients paid \$245.16 (IQR = 147.64-439.20); while outpatients paid \$147.37 (IQR = 81.42-240.50). The patients lose about 55.99% of their average annual income. Outpatients pay \$0, 92 less than in patients (P = 0.00, CI -0.72-0.34), and the cost increases by \$0.2 for the patients who came from Oromia. The cost of transportation and medication were the one which were significantly affecting the burden; but the total cost of treatment was lesser when compared to similar studies done in different areas. The cost balances toward the patients who came from the Oromiya region. Treatment service has to be extended to West Arsi Zone to minimize the cost of transportation and awareness about cancer is needed in the first place and due attention has to be given to thyroid cancer. Furthermore, facility side study should be done to see the complete picture of the burden.

# Tefera, D. A., & Bijman, J. (2021). Economics of contracts in African food systems: Evidence from the malt barley sector in Ethiopia. *Agricultural and Food Economics*, 9(1). Scopus. https://doi.org/10.1186/s40100-021-00198-0

### Abstract

Foreign direct investment (FDI) facilitates modernization of domestic agri-food systems in emerging economies through increased use of vertical coordination. This paper sheds lights on how international brewer investments in African food systems affect smallholder market participation and value chain development. In particular, we analyze the impact of contracts among malt barley producers in Ethiopia. Using cross-sectional survey data, we employ inverse probability-weighted regression adjustment (IPWRA) and propensity score matching (PSM) techniques to analyze the economic impact of contracting. We find that contrary to popular belief, contracting has positive and significant impact on malt barley production, intensification, commercialization, quality improvement, and farm gate prices, ultimately resulting in increased net income and spillover into the productivity of other food crops. Kinati, C., Ameha, N., Girma, M., & Nurfeta, A. (2021). Efective microorganisms, turmeric (Curcuma longa) as feed additiveson production performance and sensory evaluation of eggs fromWhite Leghorn hens. Livestock Research for Rural Development, 33(1). Scopus. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85100171748&partnerID=40&md5=a00047e6e5add3cb784021268a557f55

#### Abstract

This study was conducted to evaluate the effect of commercial effective microorganism (EM), turmeric powder(TP), and their combination as feed additives on layer performance and sensory evaluation of eggs in whiteleghorn hens. A total of 144 white Leghorn hens, 26 weeks old, were assigned into four treatments, three replications each with twelve-layers per replications. Treatments were control (no additive), 0.5% ml/lit EM,0.5% TP, and 0.25ml/lit EM and 0.25TP for CTL, EM, TP and EM-TP, respectively. Feed intake, body weightgain, feed conversion ratio, mortality, Egg number/hen, hen-day egg production, and egg mass were similar(P 0.05) among the treatments. Supplementing of laying hen diet with essential microorganisms (EM) and turmeric powder had no effect on a production but improved egg quality.

Haji, Y., Taddesse, F., Serka, S., & Gebretsadik, A. (2021). Effect of balneotherapy on chronic low back pain at hot springs in southern ethiopia: Perceived improvements from pain. Journal of Pain Research, 14, 2491–2500. Scopus. https://doi.org/10.2147/JPR.S322603

### Abstract

#### Background

Low back pain (LBP) is an important musculoskeletal condition results in clinical, social and public health problems globally. Hydrotherapy, using water and heat together can be utilized to treat conditions, relieve pain and increase muscular power and a range of joint movement in patients with chronic lower back pain. Most patients with acute LBP improve spontaneously within four weeks; however, chronic LBP is extremely common and usually mechanical in nature.

#### **Objective**

The objective of the current study was to assess effect of balneotherapy in decreasing the lower back pain and its improvements among adults using a spa in southern Ethiopia. Methods: We employed a single arm cohort study and convenient sampling method to select 442 study

participants from four hot springs located in Sidama Region and Gedeo Zone, Southern Ethiopia. Structured and pretested questionnaire was used and administered face-to-face by trained data collectors. Data were entered using EpiData and transferred to SPSS for cleaning and analysis. Descriptive and bivariate analyses were made.

#### Results

A total of 427 participants were included in the study giving response rate of 96.6%. The mean (standard deviation) age of respondents was 42.55 ( $\pm$ 14.92) years. Perceived improvement from back pain was 332 (77.8%) with 95% confidence interval (CI) of 74–82%. Factors showing association with perceived improvement from back pain after spa therapy were, study site being near Hawassa (Burkitu) with crude odds ratio (COR) of 3.3 and 95%CI: 1.83–5.98 and p-value <0.001; and sex of respondents that the odds of perceived improvements among males were about twofold compared with females, (COR: 1.7, 95%CI: 1.07–2.74, p-value 0.025.

### Conclusion

Our study shows significant perceived improvement from back pain after utilization of spa water. This is associated with type of hot spring used, male sex, and having neurological symptoms. Therefore, hot spring spa water had better therapeutic effect for back pain and emphasis should be given to integrate it with modern medicine and further experimental study to be conducted to recommend it for medical purposes.

Wakjira, C. K., Zeleke, N. A., Abebe, M. G., & Abeshu, A. N. (2021). Effect of Beneficial Microorganisms, Turmeric (Curcuma Longa), and Their Combination as Feed Additives on Fertility, Hatchability, and Chick Quality Parameters of White Leghorn Layers. *Journal of World's Poultry Research*, *11*(3), 359–367. Scopus. https://doi.org/10.36380/JWPR.2021.43

### Abstract

The use of probiotics, yeast, and other natural feed additives in poultry feeds has received a lot of attention in recent years. The increased public awareness and opposition to the use of antibiotics as a growth promoter has sparked a lot of interest. Therefore, this study was conducted to evaluate the effect of multi-strain effective microorganisms (EM), turmeric powder (TP), and their combination (EM-TP) on fertility, hatchability, and chick quality of White Leghorn layer chickens. A total of 144 White Leghorn hens aged 26 weeks were assigned into four treatments with three replications for each treatment (12 layer chickens and 2 cocks per replications). The treatments

consisted of no additive or control (CTL), control + 0.5 ml/lit EM, control + 0.5% TP, and control + 0.25 ml/lit EM + 0.25% TP (EM-TP) which were arranged in a complete randomized design. There was no significant difference in embryonic mortality at different growth stages among treatments while the highest fertility was for EM. The lowest hatchability on fertile egg and total egg basis was observed in hens fed the control diet. Hatchability on the total egg basis for TP was lower than that of EM. The lowest average chick weight and length values were for the control treatment. The yield percentage for the control was lower than those fed a diet containing EM and a combination of EM and TP. There were no significant differences in the visual score of chick quality measurement among treatments. In conclusion, the use of EM and TP alone and its combination as an additive to the diet of White Leghorn layer chickens improved hatchability percentage, chick weight at hatch, and chick length. Further study is suggested to determine the optimum level of EM and TP inclusion in layer breeder diet to achieve the desired beneficial outcome on fertility, hatchability, and chick quality traits.

Kindeya, F., Hailu, W., Dessalegn, T., & L Kibr, G. (2021). Effect of blending ratio of wheat, orange fleshed sweet potato (Ipomoea batatas L.) powder and haricot bean (Phaseolus vulgarisL.) flour on proximate composition, physical properties and sensory acceptability of biscuits. *F1000Research*, *10*, 506. Scopus. https://doi.org/10.12688/f1000research.52634.1

### Abstract

#### Background

Protein-energy deficiency (PEM) is still a major health issue in developing countries, and it is the leading cause of disease and death in children under the age of 5 years.

### Methods

100:0:0; 90:5:5; 80:10:10; 70:15:15; 60:20:20; and 50:25:25 per cent wheat:haricot bean: orangefleshed sweet potato (OFSP) flours were used to make composite cookies. Standard methods were used to evaluate the proximate structure, physical properties, and sensory assessment. A one-way analysis of variance (ANOVA) model was used to statistically evaluate the data using the statistical analysis system (SAS) software package, version 9.0 standard methods.

#### Results

The results showed that partially replacing wheat with haricot bean and OFSP increased the proximate composition significantly. When wheat was replaced with haricot bean and OFSP, the

physical characteristics of the biscuits did not vary significantly from those of biscuits made entirely of wheat flour. Sensory acceptability (appearance, color, flavor, taste, and overall acceptability) was higher in the composite biscuits with up to 40% wheat substitution than in the 100% wheat flour biscuits.

#### Conclusions

Based on the findings of this report, using OFSP and a haricot bean to wheat flour blend in biscuit formulation appears to be promising in terms of nutritional quality, acceptability, and cost. It is proposed that these products be marketed to vitamin A deficiency (VAD) customers as a newly established product to help mitigate food insecurity.

# Tamasgen, N., Urge, M., Girma, M., & Nurfeta, A. (2021). Effect of dietary replacement of soybean meal with linseed meal on feed intake, growth performance and carcass quality of broilers. *Heliyon*, 7(11). Scopus. https://doi.org/10.1016/j.heliyon.2021.e08297

#### Abstract

To increase the chicken's productivity and performance it is imperative to exploit underutilized oil crops such as linseed meal as protein source. This study evaluated the effect of replacing soybean meal with graded levels of linseed meal on feed intake, growth performance and carcass parameters of broiler chickens. A total of 180 day-old Cobb500 broilers were distributed to five treatment diets in a completely randomized design replicated three times with 12 chicks each. Isocaloric and isonitrogenous treatment diets formulated were T1 (0%, diet with no linseed meal), T2 (25%), T3 (50%), T4 (75%) and T5 (100%, soybean meal in the diet was replaced by linseed meal). The feeding experiment lasted for 44 days. The total feed intake, mortality rate and feed conversion ratio (FCR) during starter phase were similar (P > 0.05) among treatments. High (P < 0.05) starter phase body weight was recorded for T3 compared to T1, T2, T4 and T5 treatments but T2, T4 and T5 had similar average daily gain. The feed intake, body weight change, FCR and mortality during finisher phase and entire period were similar (P > 0.05) among treatment groups. The weight of most carcasses were similar (P > 0.05) among treatment except the weight of kidney, heart, breast, liver and abdominal fat. Kidney weight for T1 and T3 were higher (P < 0.05) than for T2, T4 and T5. The weight of heart for T3 was higher than T2 and T5 while T1, T3 and T4 were similar (P > 0.05). High (P < 0.05) breast weight were observed for T3 than T2 and T4. Liver weight for T3 was greater (P < 0.05) than T2 and T5. The total feed cost decreased with increasing levels of linseed meal. High net return was obtained from T3 followed by T4 and T2. The results showed that although linseed meal can replace 100% soybean meal in the ration without detrimental effect on the health, replacement at 50% (T3) is recommended for better performance of broilers.

Muluneh, M. G., Feyissa, M. T., & Wolde, T. M. (2021). Effect of forest fragmentation and disturbance on diversity and structure of woody species in dry Afromontane forests of northern Ethiopia. *Biodiversity and Conservation*, 30(6), 1753–1779. Scopus. https://doi.org/10.1007/s10531-021-02167-x

#### Abstract

Anthropogenic disturbance and fragmentation have changed the structure and composition of northern Ethiopian forests. This study was conducted to determine disturbance levels of patches, and examine the effect of anthropogenic disturbance and fragment size on diversity and structural attributes of woody species. A systematic sampling method was used to collect data and 61 nested plots of each 400 m2 were used. The disturbance index was used to assess disturbance intensities. To examine the effects of fragment size and anthropogenic disturbances on woody species diversity and structure, regression analysis was performed. ANOVA was used to examine differences in woody species diversity and structural attributes among fragments. Similarities among patches were assessed by Sorensen's similarity index. A total of 80 woody species, representing 68 genera and 43 families were recorded. Diversity, evenness, stem density ha-1, and basal area were  $2.8 \pm 0.47$ ,  $0.73 \pm 1.10$ ,  $1171.21 \pm 220.10$ , and  $39.89 \pm 17.47$  m2 ha-1 respectively. The mean number of species, evenness, and diversity were significantly different among fragments. Diversity, evenness, the mean number of species, and stem density per hectare significantly increased with increasing fragment size. Disturbance intensities varied among fragments. However, the mean basal area, mean seedling, and sapling density per hectare were not significantly affected by patch size and disturbance intensities. Generally, forest fragmentation and anthropogenic disturbance resulted in the reduction of diversity, affect woody species structure, and increased the level of disturbance. Therefore, recognizing the role of small fragments for forest conservation, minimizing further disturbance, and undertaking restoration activities in disturbed patches are strongly needed.

Terefe, Z. K., Omwamba, M. N., & Nduko, J. M. (2021). Effect of solid state fermentation on proximate composition, antinutritional factors and in vitro protein digestibility of maize flour. *Food Science and Nutrition*, 9(11), 6343–6352. Scopus. https://doi.org/10.1002/fsn3.2599

#### Abstract

Cereals including maize generally have limiting amino acids particularly lysine. In most cases, spontaneous fermentation is used to improve the nutritional profiles of maize-based products. However, in such fermentation, biological risks including the presence of pathogenic microorganisms, chemical contaminants, and toxic compounds of microbial origin such as mycotoxins pose a health risk. The aim of this study was, therefore, to improve the nutritional properties of maize flour by reducing antinutritional factors through microbial fermentation by strains of Lactobacillus plantarum and Saccharomyces cerevisiae and their cocultures. A factorial experimental design was used to evaluate the effect of fermentation setups and time on proximate composition, antinutritional factors, and in vitro digestibility of proteins in maize flour. During 48 h of fermentation, protein content was improved by 38%, 55%, 49%, and 48%, whereas in vitro protein digestibility improved by 31%, 40%, 36%, and 34% for natural, Lactobacillus plantarum, Saccharomyces cerevisiae, and their coculture-fermented maize flour, respectively. The highest improvement in protein content and its digestibility was observed for Lactobacillus plantarum strain-fermented maize flour. Phytate, tannin and trypsin inhibitor activity were reduced significantly (p <.05) for natural, Lactobacillus plantarum, Saccharomyces cerevisiae, and coculture-fermented maize flour. The highest reduction of phytate (66%), tannin (75%), and trypsin inhibitor (64%) was observed for coculture-fermented maize flour. The two strains and their cocultures were found feasible for fermentation of maize flour to improve its nutritional profiles more than the conventional fermentation process.

Tesfaye, B., Ermias, D., Moges, S., & Astatkie, A. (2021). Effect of the test and treat strategy on mortality among hiv-positive adult clients on antiretroviral treatment in public hospitals of Addis Ababa, Ethiopia. *HIV/AIDS - Research and Palliative Care*, *13*, 349–360. Scopus. https://doi.org/10.2147/HIV.S303557

### Abstract

#### Background

The primary goal of antiretroviral therapy is to prevent human immune deficiency virus (HIV)related morbidity and mortality. Deferring antiretroviral therapy (ART) until CD4 counts decline puts individuals with HIV at risk of HIV-related morbidity and mortality. Objective: This study aims to assess the effect of the test and treat strategy on mortality among HIV-positive clients on ART in public hospitals in Addis Ababa.

#### Methods

A retrospective cohort study was conducted at five selected public hospitals in Addis Ababa. A cohort of 216 ART clients taken as an exposed group (test and treat" strategy) from 2017 to 2019 and 216 ART clients as an unexposed group taken from 2014 to 2017; totally, 432 clients were included in the study. Multivariate Cox regression was used to estimate the effect of the test and treat strategy on the survival of ART clients adjusting for other covariates.

# Results

The 432 clients contributed to a total of 1025.17 person-years follow-up. Ninety-one (21.06%) of them died, 14.3% were unexposed and 6.7% were exposed (test and treat). The incidence of death was 92.4 and 81.8/1000 person-years in the unexposed group and exposed group, respectively, with an overall mortality rate of 88.8/1000 person-years. Besides, test and treat strategy (AHR: 0.31; 95% CI: 0.19, 0.52), baseline CD4 counts >350 cells/mm3 (AHR 0.40; 95%: CI: 0.20, 0.80), bedridden functional status (AHR 2.46; 95% CI: 1.41, 4.27), poor adherence (AHR 3.25; 95% CI: 1.410–7.51), moderate malnutrition on last visit (AHR 2.56; 95% CI: 1.30–5.04) and staying on original regimen (AHR 4.68; 95% CI 2.72, 8.07) were independent predictors of mortality. **Conclusion** 

Mortality among HIV patients on treatment decreased significantly since the start of the test and treat strategy. Therefore, test and treat strategy should be strengthened in all public and private facilities throughout the country.

Gupta, A. K., Pachauri, R. K., Maity, T., Chauhan, Y. K., Mahela, O. P., Khan, B., & Gupta, P. K. (2021). Effect of Various Incremental Conductance MPPT Methods on the Charging of Battery Load Feed by Solar Panel. *IEEE Access*, *9*, 90977–90988. Scopus. https://doi.org/10.1109/ACCESS.2021.3091502

#### Abstract

The presented work in this paper deals with various step sizes used in incremental conductance (INC) related to the maximum power point tracking (MPPT) technique. In the solar photovoltaic system, the variable step size selection method for INC is proposed and compared. The MATLAB/Simulink and hardware setup are used for assessing and analyzing step size methods. The variable step size (DVS), fixed step size (DFS) are comprehensively studied and compared. This DVS method is having a lower ON delay time  $\left( \left\{ T_{d_{ON}} \right\} \right\} \right)$  as 148 msec as regard to 164 msec in the DFS method. On the other hand, the lowest peak-peak oscillations in load current as 0.04 amp for DVS as compared to 0.5A for the DFS method, lower peak current as 1.96A for DVS as compare to 2.37A for the DFS method. In this way, the performance of the DVS method is found superior as it is analyzed and compared with the DFS algorithm.

# Genanaw, W., Kanno, G. G., Derese, D., & Aregu, M. B. (2021). Effect of Wastewater Discharge From Coffee Processing Plant on River Water Quality, Sidama Region, South Ethiopia. *Environmental Health Insights*, 15. Scopus. https://doi.org/10.1177/11786302211061047

### Abstract

In Ethiopia, most of the coffee processing plants are generating large amounts of wastewater with high pollutant concentrations and discharge directly into the water bodies untreated or partially treated. The main objective of this study was to assess the effects of coffee wastewater discharged to river water quality using physicochemical parameters and macro-invertebrate indices. This study was conducted from November to the end of December 2019. Ten wastewater and river water samples were taken from coffee the processing plant and river. The macro-invertebrate samples were collected by kick sampling technique using a standard hand net. Shannon and Simpson diversity indices were examined at 3 sampling stations. The Pielou evenness index was

also determined. It was found that except for TDS all the parameters of the raw wastewater and river water did not comply with the international discharge limit. The mean concentration of Faro coffee processing plant wastewater were BOD5 (2409.6  $\pm$  173.1 mg/L), COD (4302  $\pm$  437 mg/L), TSS (2824.6  $\pm$  428.4 mg/L), TDS (3226  $\pm$  623.6 mg/L), and TS (4183.3  $\pm$  432.9 mg/L). Whereas from Bokaso coffee processing plant were BOD5 (3770  $\pm$  604.4 mg/L), COD (4082.6  $\pm$  921.9 mg/L), TSS (2766  $\pm$  501.7 mg/L), TDS (3017  $\pm$  747.6 mg/L), and TS (3874  $\pm$  471.1 mg/L). A total of 392 macroinvertebrates belonging to 24 families and 7 orders were collected. The benthos assemblage communities in this river were 40, 56, and 296 at downstream 1, downstream 2, and upstream respectively. The value of the Simpson diversity index varies from 0.4 to 0.75. In the same manner, the value of the Shannon diversity index also varied from 0.5 to 1.36. Most of the physicochemical parameters of the raw wastewater were beyond the national and international discharge limits. The quality of Orsha river water downstream was more adversely affected compared to upstream.

Mezgebe, A., & Azerefegne, F. (2021). Effect of water stress on glucosinolate content of Brassica carinata and performance of Brevicoryne brassicae and Myzus persicae. *International Journal of Tropical Insect Science*, 41(2), 953–960. Scopus. https://doi.org/10.1007/s42690-020-00340-3

#### Abstract

Drought-related changes in plant chemical composition affect plant resistance to insect herbivores. Ethiopian mustard (Gomenzer) Brassica carinata (A) Braun var. Yellow Dodolla was grown under three different water treatments; drought-stressed, well-watered and water-logged conditions to evaluate glucosinolate content and performance of two aphid species, the generalist Myzus persicae (Sulzer) and specialist Brevicoryne brassicae (L.). The analysis of High Performance Liquid Chromatography showed that water stress altered the levels of glucosinolates in (B) carinata plants. Plants cultivated under water-logged showed significantly higher glucosinolate content (2.236  $\mu$ mol/g) when compared to well-watered (1.307  $\mu$ mol/g) plants, whereas plants grown under drought-stressed (0.773  $\mu$ mol/g) showed significantly reduced glucosinolate content after two week stress. B. carinata plants grown under water-logged condition had significantly higher sugar level (785.8  $\mu$ g/g) followed by well-watered (667.6  $\mu$ g/g) and drought-stressed (637.9  $\mu$ g/g)

plants after two week stress. Both aphid species reacted differently to water stress-induced change in the host plants. Significantly higher number of B. brassicae was recorded on plants grown under drought-stressed (395 aphids) plants than well-watered (278 aphids) and water-logged plants (179 aphids). Populations of M. persicae were significantly larger on plants grown under water-logged (558 aphids) and followed by well-watered (329 aphids) and drought-stressed plants (193 aphids). Feeding by both aphid B. brassicae and M. persicae increased significantly the level of glucosinolates in B. carinata plants. B. brassicae induced higher amount of glucosinolate content (3.85  $\mu$ mol/g) when feeding on drought-stressed plants whereas M. persicae induced higher glucosinolate content (3.55  $\mu$ mol/g) on water-logged plants. Water stressed B. carinata plants resulted to lower glucosinolate content and higher aphid population.

Alam, M.-U., Ferdous, S., Ercumen, A., Lin, A., Kamal, A., Luies, S. K., Sharior, F., Khan, R., Rahman, M. Z., Parvez, S. M., Amin, N., Tadesse, B. T., Moushomi, N. A., Hasan, R., Taneja, N., Islam, M. A., & Rahman, M. (2021). Effective treatment strategies for the removal of antibiotic-resistant bacteria, antibiotic-resistance genes, and antibiotic residues in the effluent from wastewater treatment plants receiving municipal, hospital, and domestic wastewater: Protocol for a systematic review. *JMIR Research Protocols*, *10*(11). Scopus. https://doi.org/10.2196/33365

#### Abstract

## Background

The widespread and unrestricted use of antibiotics has led to the emergence and spread of antibiotic-resistant bacteria (ARB), antibiotic-resistance genes (ARGs), and antibiotic residues in the environment. Conventional wastewater treatment plants (WWTPs) are not designed for effective and adequate removal of ARB, ARGs, and antibiotic residues, and therefore, they play an important role in the dissemination of antimicrobial resistance (AMR) in the natural environment.

#### Objective

We will conduct a systematic review to determine the most effective treatment strategies for the removal of ARB, ARGs, and antibiotic residues from the treated effluent disposed into the environment from WWTPs that receive municipal, hospital, and domestic discharge. Methods: We will search the MEDLINE, EMBASE, Web of Science, World Health Organization Global Index Medicus, and ProQuest Environmental Science Collection databases for full-text peer-reviewed

journal articles published between January 2001 and December 2020. We will select only articles published in the English language. We will include studies that measured (1) the presence, concentration, and removal rate of ARB/ARGs going from WWTP influent to effluent, (2) the presence, concentration, and types of antibiotics in the effluent, and (3) the possible selection of ARB in the effluent after undergoing treatment processes in WWTPs. At least two independent reviewers will extract data and perform risk of bias assessment. An acceptable or narrative synthesis method will be followed to synthesize the data and present descriptive characteristics of the included studies in a tabular form. The study has been approved by the Ethics Review Board at the International Centre for Diarrhoeal Disease Research, Bangladesh (protocol number: PR-20113).

#### Results

This protocol outlines our proposed methodology for conducting a systematic review. Our results will provide an update to the existing literature by searching additional databases. Conclusions: Findings from our systematic review will inform the planning of proper treatment methods that can effectively reduce the levels of ARB, ARGs, and residual antibiotics in effluent, thus lowering the risk of the environmental spread of AMR and its further transmission to humans and animals.

Sileshi, G., Mitiku, E., Mengistu, U., Adugna, T., & Fekede, F. (2021). Effects of Dietary Energy and Protein Levels on Nutrient Intake, Digestibility, and Body Weight Change in Hararghe Highland and Afar Sheep Breeds of Ethiopia. *Journal of Advanced Veterinary and Animal Research*, 8(2), 185–194. Scopus. https://doi.org/10.5455/javar.2021.h501

# Abstract

#### **Objectives**

The experiment was conducted to determine the effect of dietary energy and protein level growth performances of selected indigenous Ethiopian sheep breeds. Materials and Methods: Fifty intact ram lambs, 25 from each breed with 12 months of age and a mean initial body weight (IBW) of  $19.31 \pm 1.7$  kg, were employed for this experiment. Animals were distributed randomly into five dietary treatments, i.e., minimum Energy and Protein (mEmP), medium energy and protein (MEMP), medium Energy and high Protein (MEHP), high energy and medium protein (HEMP), and high Energy and high Protein (HEHP) diets in randomized complete block design with 2 \* 5

factorial arrangements. The minimum, medium, and high energy diets were 2.388, 2.866, and 3.344 Mcal/kg dry matter (DM) with the corresponding 10%, 16%, and 20% crude protein (CP) diets, respectively. The diets were formulated in a total mixed ration from wheat bran (WB), maize grain, peanut cake, and pasture hay feed ingredients. Diet offer was at the rate of 3% of lambs' live weight and revised biweekly as per the attained body weight changes. Digestibility trial was conducted for 7 days of actual fecal data collection, followed by 90 days of feeding trial.

# Results

The animals fed on the MEHP diet had a maximum DM and nutrient intakes (CP and organic matter) and the best final body weight (FBW), total gain, gain rate, average daily gains, and feed conversion efficiency (31.3, 12.9 kg, 41.2%, 143.3 gm, and 23.13, respectively), followed by HEMP, HEHP, MEMP, and mEmP diets. Digestibility of DM and nutrients linearly followed similar trends (p < 0.01). Hararghe sheep was heavier (p < 0.01) by 4.3 and 3.1 kg in its FBW and total gain and more efficient in nutrients utilization (22.57 vs. 18.18) as compared to Afar sheep (AS).

# Conclusion

It is concluded that MEHP and MEMP are superior and optimum diets for sheep breeds, and Hararghe sheep is carried out betterthan AS in most growth performance parameters.

# Keneni, Y. G., Bahiru, L. A., & Marchetti, J. M. (2021). Effects of Different Extraction Solvents on Oil Extracted from Jatropha Seeds and the Potential of Seed Residues as a Heat Provider. *Bioenergy Research*, *14*(4), 1207–1222. Scopus. https://doi.org/10.1007/s12155-020-10217-5

# Abstract

The present study focuses on the determination of oil contents of thirteen different jatropha seed collections from Ethiopia. The oil was extracted with a Soxhlet extractor using n-hexane which was selected out of four different solvents: diethyl ether, ethanol, n-heptane, and n-hexane. Cotton and thimble were used as filter for the extractions. Some properties of the oil of Chali seed collection and a sample of mixed oils (a mixture of equal volume of oils from thirteen different seed collections) were determined. The energy contents of selected de-oiled jatropha seed residues were also estimated. In the extraction with cotton and thimble, the largest percentage of oil yield was obtained from Dana seed (48.29%) and Chali seed (45.79) collections, respectively. The acid

value (1.32 mg KOH/g) and percentage of free fatty acids (%FFA) (0.66%) of Chali seed oil were lower than the acid value (2.12 mg KOH/g) and %FFA (1.06%) of the mixed oil, and thus, the former oil is more suitable for alkaline-catalyzed biodiesel production. The iodine values of both Chali seed oil (116.02 g/100 g) and mixed oil (109.24 g/100 g) did not exceed the maximum standard for biodiesel according to the European EN 14214 specification, and the oils could be used for biodiesel production. The gross calorific values of de-oiled jatropha seed residues after oil extraction were found to range from 18.57 to 24.03 MJ/kg, and with the average value of 19.64 MJ/kg. Thus, the de-oiled seed residues can be used as the source of heat.

# Abera, G., & Gerkabo, H. (2021). Effects of green manure legumes and their termination time on yield of maize and soil chemical properties. *Archives of Agronomy and Soil Science*, 67(3), 397–409. Scopus. https://doi.org/10.1080/03650340.2020.1733536

#### Abstract

A two-year field experiment was conducted to examine the effects of interseeded green manure (GM) legumes in maize (Zea mays L.) cropping systems and their termination time on yield of maize and soil chemical properties in southern Ethiopia. Maize variety, BH540 was planted as the main crop while three GM legumes cowpea (Vigna unguiculata L. Walp), lablab (Lablab purpureus (L.) Sweet) and hairy vetch (Vicia villosa Roth) were interseeded between maize rows. The GM legumes were terminated and incorporated into soils at 30, 45 and 60 days after planting. The amounts of dry biomass produced varied significantly (p < 0.05) among GM legumes and their termination time. The results indicated that GM legumes accumulated over 39.3–65.5 kg N ha–1 yr–1 during 2014 cropping season and 53.3–156.6 kg N ha–1 yr–1 during 2016 cropping season. However, maize stover and grain N yields were not significantly influenced by GM. The results suggest GM legumes, lablab and cowpea improved soil chemical properties (N, P and K). Therefore, interseeding and incorporation of GM legumes can be considered as an alternative mechanism of soil fertility management for sustainable crop production in southern Ethiopia, where rotational and successional GM legumes cultivation is practically impossible.

# Assefa, S., Haile, W., & Tena, W. (2021a). Effects of phosphorus and sulfur on yield and nutrient uptake of wheat (Triticum aestivum L.) on Vertisols, North Central, Ethiopia. *Heliyon*, 7(3). Scopus. https://doi.org/10.1016/j.heliyon.2021.e06614

#### Abstract

Deficiency of phosphorus (P) and sulfur (S) is increasingly being reported in soils of Ethiopia. While some studies have shown significant response of wheat to P and S application, information on the response of wheat to P and S application interactively is conspicuously lacking. In this regard, we evaluated the response of wheat to P and S application interactively in the study area. A field experiment was conducted at two locations to determine the effects of P and S, on yield, uptake and P, S use efficiency of bread wheat. A factorial combination of four levels of P (0,11,22 and 44 kg h-1) and three levels S (0, 15 and 30 kg ha-1) laid out in Randomized Complete Block Design with three replications. Results revealed that interacted application of P and S at 22 and 15 kg ha-1 respectively increased grain yield of wheat by 40.1 % over control. The corresponding increase with straw was 53.4 % over control. Wheat yield obtained with combined application of P and S greater than single application of P or S indicating synergistic between them. The maximum grain N (56.3 kg ha-1), P (12.8 kg ha-1) and S (4.2 kg ha-1) uptakes were obtained due to combined application of P and S at 22 P and 15 S kg ha-1. Agronomic efficiencies of P and S decreased as the rates of P and S application increased. Combined fertilization of S and P is necessary in the study district and 15 kg S combined with 22 kg P ha-1 produced the highest yield. Thus, this treatment is found to be recommended for bread wheat production in Vertisols of the district. While, partial budget analysis result revealed that, combination of 22P and 15S kg ha-1 produced the highest MMR (54.9%) and thus, this treatment is found to be economically feasible treatment for bread wheat production in study area of the district. We recommend further experiments on different combination of P with S in different agro-ecologies and soil types are required for confirmation of results and the residual effect of P and S on the following crop is needed to study the long-term effect of P and S.

BORZOUEI, A., MANDER, U., TEEMUSK, A., SANZ-COBENA, A., ZAMAN, M., KIM, D.-G., MULLER, C., KELESTANIE, A. A., AMIN, P. S., MOGHISEH, E., DAWAR, K., & PÉREZ-CASTILLO, A. G. (2021). Effects of the nitrification inhibitor nitrapyrin and tillage practices on yield-scaled nitrous oxide emission from a maize field in Iran. *Pedosphere*, *31*(2), 314–322. Scopus. https://doi.org/10.1016/S1002-0160(20)60067-4

#### Abstract

Nitrification inhibitors can effectively decrease nitrification rates and nitrous oxide (N2O) emission while increasing crop yield under certain conditions. However, there is no information available on the effects of nitrification inhibitors and tillage practices on N2O emissions from maize cropping in Iran. To study how tillage practices and nitrapyrin (a nitrification inhibitor) affect N2O emission, a split factorial experiment using a completely randomized block design with three replications was carried out in Northeast Iran, which has a cold semiarid climate. Two main plots were created with conventional tillage and minimum tillage levels, and two nitrogen (N) fertilizer (urea) management systems (with and without nitrapyrin application) were created as subplots. Tillage level did not have any significant effect on soil ammonium (NH4+) and nitrate (NO3-) concentrations, cumulative amount and yield-scaled N2O emission, and aboveground biomass of maize, whereas nitrapyrin application showed significant effect. Nitrapyrin application significantly reduced the cumulative amount of N2O emission by 41% and 32% in conventional tillage and minimum tillage practices, respectively. A reduction in soil NO3– concentration by nitrapyrin was also observed. The average yield-scaled N2O emission was 13.6 g N2O-N kg-1 N uptake in both tillage systems without nitrapyrin application and was significantly reduced to 7.9 and 8.2 g N2O-N kg-1 N uptake upon the application of nitrapyrin in minimum tillage and conventional tillage practices, respectively. Additionally, nitrapyrin application increased maize biomass yield by 4% and 13% in the minimum tillage and conventional tillage systems, respectively. Our results indicate that nitrapyrin has a potential role in reducing N2O emission from agricultural systems where urea fertilizers are broadcasted, which is common in Iran due to the practice of traditional farming.

# MOONIS, M., LEE, J.-K., JIN, H., KIM, D.-G., & PARK, J.-H. (2021). Effects of warming, wetting and nitrogen addition on substrate-induced respiration and temperature sensitivity of heterotrophic respiration in a temperate forest soil. *Pedosphere*, *31*(2), 363–372. Scopus. https://doi.org/10.1016/S1002-0160(20)60069-8

#### Abstract

Soil heterotrophic respiration and its temperature sensitivity are affected by various climatic and environmental factors. However, little is known about the combined effects of concurrent climatic and environmental changes, such as climatic warming, changing precipitation regimes, and increasing nitrogen (N) deposition. Therefore, in this study, we investigated the individual and combined effects of warming, wetting, and N addition on soil heterotrophic respiration and temperature sensitivity. We incubated soils collected from a temperate forest in South Korea for 60 d at two temperature levels (15 and 20 °C, representing the annual mean temperature of the study site and 5 °C warming, respectively), three moisture levels (10%, 28%, and 50% water-filled pore space (WFPS), representing dry, moist, and wet conditions, respectively), and two N levels (without N and with N addition equivalent to 50 kg N ha-1 year-1). On day 30, soils were distributed across five different temperatures (10, 15, 20, 25, and 30 °C) for 24 h to determine short-term changes in temperature sensitivity (Q10, change in respiration with 10 °C increase in temperature) of soil heterotrophic respiration. After completing the incubation on day 60, we measured substrate-induced respiration (SIR) by adding six labile substrates to the three types of treatments. Wetting treatment (increase from 28% to 50% WFPS) reduced SIR by 40.8% (3.77 to 2.23 µg CO2-C g-1 h-1), but warming (increase from 15 to 20 °C) and N addition increased SIR by 47.7% (3.77 to 5.57 µg CO2-C g-1 h-1) and 42.0% (3.77 to 5.35 µg CO2-C g-1 h-1), respectively. A combination of any two treatments did not affect SIR, but the combination of three treatments reduced SIR by 42.4% (3.70 to 2.20 µg CO2-C g-1 h-1). Wetting treatment increased Q10 by 25.0% (2.4 to 3.0). However, warming and N addition reduced Q10 by 37.5% (2.4 to 1.5) and 16.7% (2.4 to 2.0), respectively. Warming coupled with wetting did not significantly change Q10, while warming coupled with N addition reduced Q10 by 33.3% (2.4 to 1.6). The combination of three treatments increased Q10 by 12.5% (2.4 to 2.7). Our results demonstrated that among the three factors, soil moisture is the most important one controlling SIR and Q10. The results suggest that the effect of warming on SIR and Q10 can be modified significantly by rainfall variability and

elevated N availability. Therefore, this study emphasizes that concurrent climatic and environmental changes, such as increasing rainfall variability and N deposition, should be considered when predicting changes induced by warming in soil respiration and its temperature sensitivity.

# Mulualem, D., Hailu, D., Tessema, M., & Whiting, S. J. (2021). Efficacy of calciumcontaining eggshell powder supplementation on urinary fluoride and fluorosis symptoms in women in the ethiopian rift valley. *Nutrients*, *13*(4). Scopus. https://doi.org/10.3390/nu13041052

#### Abstract

calcium binds Fluoride (F), thus preventing excess F absorption. We aimed to assess the efficacy of supplementing calcium-containing Eggshell Powder (ESP) on F absorption using urine F excretion and on fluorosis symptoms. In total, 82 women (41 Intervention Group, IG; 41 Control Group, CG) were recruited; overall, 39 in each group completed the trial. Morning spot urine was collected before (baseline, BL) and after (endline, EL) the intervention that was 6-months daily supplementation with 2.4 g ESP (providing ~1000 mg of calcium). Dental, skeletal, and non-skeletal fluorosis assessments was carried out at BL and, except for dental, at EL. Relative risk (RR) and linear generalized estimating equation were used to compare outcomes between groups. At BL, urinary F excretion in the IG and CG groups was similar, ~10 mg/L. At EL, urinary F excretion in IG women was six-fold lower ( $\beta = -6.1$  (95% CI: -7.1, -5.1)) compared to CG. The risk of developing skeletal and non-skeletal fluorosis were significantly (p < 0.001) reduced in the intervention group. A significant reduction in urinary F excretion and reduction in many fluorosis symptoms were ob-served among women supplemented with calcium-containing ESP, thus providing evidence for using this dietary calcium source for mitigation of fluorosis. Clinical trials registration: NCT03355222.

Wolde, S., Mirkena, T., Melesse, A., Dessie, T., & Abegaz, S. (2021a). EGG PRODUCTION AND QUALITY TRAITS OF SASSO-RIR, NORMAL FEATHERED LOCAL AND THEIR F1 CROSS CHICKENS MANAGED UNDER ON-STATION CONDITION IN SOUTHERN ETHIOPIA †. *Tropical and Subtropical Agroecosystems*, 24(3). Scopus. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85126509487&partnerID=40&md5=d9834a0ea815db746af47f1d9a88e1a4

# Abstract

#### **Background.**

Poultry production is a tool for livelihood improvement and poverty alleviation in the developing countries. Indigenous chickens are numerous but lower in egg production performance than exotic chickens in Ethiopia. Objective. To compare egg yield, feed conversion ratio (FCR), mortality, and egg quality traits of Normal feathered local (LL), Sasso-RIR (SRSR) and their F1-cross (LSR) chickens under on-station conditions.

### Methodology.

Data on egg production, feed intake and mortality were collected for 33 weeks whereas egg quality was assessed at 6, 9 and 12 months of age at poultry farm of Hawassa University. The experiment was laid out with Completely Randomized Design with four replications.

# **Results.**

Next to SRSR chickens, LSR performed higher than LL chickens in terms of egg number per hen (96.8), egg weight (46.9 g/egg), daily feed intake (102 g/hen), body weight (1882 g/hen), albumen height (5.97 mm), albumen weight (27.2 g/egg) and albumen weight ratio (56.8). FCR was best, intermediate and worst for SRSR (4.19), LL (4.57), and LSR (5.20) chickens, respectively. Higher egg weight (52.9 g), yolk weight (18.3 g), albumen weight (28.9 g), and yolk weight ratio (35.1) were obtained from eggs of older hens whereas higher albumen weight ratio (59.4) and shell weight ratio (11.0) were obtained from eggs of younger hens. For LL chickens, the lowest values of egg weight, egg length, yolk color, albumen weight, albumen weight ratio were obtained at older ages whereas the lowest value of yolk weight ratio was obtained at younger ages. Implications. The results of the present study contribute in knowing the effects of cross-breeding of LL chicken with SRSR chicken on egg yield and quality.

## **Conclusions.**

The exotic blood of Sasso-RIR chicken had played a significant role in upgrading most of the economically important egg production and quality traits. However, the influence of genotype on some egg quality traits depends on laying age of hen.

Yigezu, Z. D., & Jawo, T. O. (2021). Empirical analysis of fuelwood consumptions and its environmental implications in rural sub-city, Southern Ethiopia. *International Journal of Sustainable Energy*, 40(5), 448–459. Scopus. https://doi.org/10.1080/14786451.2020.1812609

#### Abstract

Consumption of fuelwood contributes to forest degradation and greenhouse gas emissions in developing countries. The aim of the present study was to assess the household energy sources and their contribution to climate change. Multi-stage sampling procedure was employed to select sample households. A total of 152 households with different wealth status were included in the present investigation. Firewood consumption and GHG emission at household level were estimated. Average annual firewood consumption per household was 2781.30kg (2.78t). The amount of firewood consumed per household could emit 337.62kg CO2e/yr. Use of improved stove could help to save 1.05t of firewood and protect  $4 \times 10$ –3ha of forest degradation per year per household. To reduce the use of biomass as household energy source and its environmental impacts, all stakeholders need to work on awareness creation and provision of alternative household energy sources and improved fuel-saving stoves.

Raj Nadimuthu, L. P., Victor, K., Basha, C. H., Mariprasath, T., Dhanamjayulu, C., Padmanaban, S., & Khan, B. (2021). Energy Conservation Approach for Continuous Power Quality Improvement: A Case Study. *IEEE Access*, *9*, 146959–146969. Scopus. https://doi.org/10.1109/ACCESS.2021.3123153

#### Abstract

This work focused on a harmonic mitigating filter and investigated the effect of the harmonic mitigating filter in the textile industry with innovative energy conservation strategies for energy bill reduction, which covers a pathway to climate change mitigation. Here, the effect of the harmonic filter is found out by the systematic energy audit methodology (Preliminary, Detailed

and Post-Audit phase). From the energy auditing, it has been found that the textile industry needed a passive harmonic filter for harmonic mitigation. Since, third, fifth, and seventh order of harmonic predominantly exists in the system. The high stability at higher current, known tuning frequency, low cost and low power consumption makes the passive filter to be the best fit for the system. The voltage and current Total Harmonic Distortion Factor (THDF) have been measured using the class 'A' power quality and energy analyzer. The harmonic filter's effect in harmonics mitigation is prominent; 66.45% of the reduction of current harmonics which is achieved after installing the passive filter at the Point of Common Coupling (PCC) of the system. Also, the reduction of harmonics ensures energy conservation through the reduction of additional losses (joule, copper and eddy current losses). The techno-economic analysis with payback period calculation is carried out and reported. Also, the effect of harmonics like mechanical anomalies (temperature rise) is carefully studied using an infrared thermo graphic technique in the textile industry's motor loads. The energy conservation and their carbon emission reduction are calculated and reported.

# Legamo, T. M., Ščasný, M., & Tasew, W. (2021). Energy expenditure and fuel choices among households in the Sidama region, Southern Ethiopia. *International Journal of Energy Economics and Policy*, *11*(2), 315–324. Scopus. https://doi.org/10.32479/ijeep.8559

# Abstract

Using the data from an original survey, we analyse energy use patterns and, in particular, energy use for cooking in households from Hawassa City, Southern Ethiopia. Cooking is the main energy-related activity on which households spend money. This expenditure represents 89% of total energy expenditure and a fifth of a household's total budget. Expenditure on modern energy and electricity represents only about a fifth of an energy budget, whilst fuelwood, a potentially health damaging energy, still prevails as the main energy used for cooking in Hawassa. There are, however, large differences in energy use between urban and suburban areas. While fuelwood and charcoal are the main sources for cooking among the poorest households, and fuelwood is the dominant source for cooking in suburban locations, electricity is the energy source used mainly in urban areas and especially among richer households. Our research is also in line with results found for other countries in sub-saharan Africa. Energy expenditure, as well as the use of electricity for cooking, are both sharply increasing with household income. The effect of income on using
fuelwood is the opposite. Large families are more likely to prefer fuelwood and less likely to choose charcoal. Female-headed households are more likely to choose charcoal for cooking; however, if females make decisions about household purchases, they prefer to use fuelwood. Formal education increases the likelihood of using cleaner electricity and decreases the usage of fuelwood. Formal education, alongside income, seems to be the key factor in moving from traditional health-damaging energy sources towards modern and clean energy sources.

#### Onyema, E. M., Shukla, P. K., Dalal, S., Mathur, M. N., Zakariah, M., & Tiwari, B. (2021). Enhancement of Patient Facial Recognition through Deep Learning Algorithm: ConvNet. *Journal of Healthcare Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/5196000

#### Abstract

The use of machine learning algorithms for facial expression recognition and patient monitoring is a growing area of research interest. In this study, we present a technique for facial expression recognition based on deep learning algorithm: Convolutional neural network (ConvNet). Data were collected from the FER2013 dataset that contains samples of seven universal facial expressions for training. The results show that the presented technique improves facial expression recognition accuracy without encoding several layers of CNN that lead to a computationally costly model. This study proffers solutions to the issues of high computational cost due to the implementation of facial expression recognition by providing a model close to the accuracy of the state-of-the-art model. The study concludes that deep l\earning-enabled facial expression recognition techniques enhance accuracy, better facial recognition, and interpretation of facial expressions and features that promote efficiency and prediction in the health sector.

Roy, P. K., Qamar, A. Y., Tanga, B. M., Fang, X., Kim, G., Bang, S., & Cho, J. (2021). Enhancing Oocyte Competence With Milrinone as a Phosphodiesterase 3A Inhibitor to Improve the Development of Porcine Cloned Embryos. *Frontiers in Cell and Developmental Biology*, 9. Scopus. https://doi.org/10.3389/fcell.2021.647616

#### Abstract

The objective of this study was to investigate the effect of milrinone supplementation as a phosphodiesterase 3A inhibitor during in vitro maturation (IVM) to coordinate the cytoplasmic and nuclear maturation of porcine oocytes and subsequent development of porcine cloned embryos. Brilliant cresyl blue (BCB)-stained (BCB +) oocytes, classified as well-developed, and BCB- oocytes were used in parthenogenesis (PA) and cloning, and their preimplantation development was compared. In PA embryos, BCB + oocytes had significantly higher rates of development than BCB- oocytes in terms of maturation (87.5 vs. 71.3%), cleavage (88.6 vs. 76.3%), and blastocyst development (34.3 vs. 25.3%) and also had higher cell numbers (46.9 vs. 38.9%), respectively (p < 0.05). In cloned embryos, the BCB + group also had a significantly higher blastocyst formation rate than the BCB- group (30.6 vs. 20.1%; p < 0.05). Supplementation with 75 µM milrinone during IVM of BCB- oocytes showed improvement in maturation and blastocyst development rates, which may be due to the coordinated maturation of the cytoplasm with the nucleus as an effect of milrinone. Moreover, the analysis of nuclear reprogramming via the examination of the expression levels of the reprogramming-related genes POU5F1, DPPA2, and NDP52IL in milrinone-supplemented BCB- oocytes showed higher expression levels than that in non-treated BCB- oocytes. These findings demonstrate that milrinone is useful in improving developmental competence in less competent oocytes during IVM and for proper nuclear reprogramming in the production of porcine cloned embryos by coordinating cytoplasmic and nucleus maturation.

Gebretsadik, A., Bogale, N., & Negera, D. G. (2021). Epidemiological Trends of Breast Cancer in Southern Ethiopia: A Seven-Year Retrospective Review. *Cancer Control*, 28. Scopus. https://doi.org/10.1177/10732748211055262

#### Abstract

#### Introduction

African women are affected by cancer at an early age of their productivity. However, the exact prevalence and incidence of cancer, including breast cancer is not known in most sub-Saharan African countries, including Ethiopia because of lack of well-established cancer registry. This study aims to assess the epidemiology of breast cancer at Hawassa University Comprehensive Specialized Hospital (HUCSH), the biggest referral hospital with cancer treatment center serving the southern part of the country.

#### Methods

Retrospective review of charts of all patients with a diagnosis of breast cancer between 2013 and 2019 at HUCSH was conducted. A standardized questionnaire was used to collect relevant data that include sociodemographic, symptoms, type of diagnosis, treatment, and outcomes. Data were entered using epidata version 3.1 and analyzed using MS Excel and SPSS version 20.

#### Results

Five hundred fifty-nine (18.6%) breast cancer cases were retrieved in 7 years between 2013 and 2019. Of this, 548 (98%) were women. The median ages of the patents were 38 years. Invasive ductal carcinoma was the leading 309 (55.3%) histologic type followed by 185 (33.1%) lobular carcinoma. One hundred seventy-seven (31.7%) were moderately differentiated and 155 (27.7%) were poorly differentiated. Three hundred seventy-two (66.5%) were advanced breast cancer (Stages III and IV). Trends of breast cancer showed the case load is continuously increasing except with a slight reduction of cases in between 2015 and 2016. The majority were advanced breast cancer occurring at an early age by the time diagnosis made. Invasive ductal carcinomas were the predominant one. The trend also showed a continuous increment of cancer case load. Therefore, cancer registration center establishment, community awareness creation, and intensive early detection strategy are mandatory.

Zeleke, M., Hailu, D., & Daka, D. (2021). Erectile dysfunction and associated factors among diabetic patients at, Hawassa, Southern, Ethiopia. *BMC Endocrine Disorders*, *21*(1). Scopus. https://doi.org/10.1186/s12902-021-00807-5

#### Abstract

#### Background

Erectile dysfunction is an inability to initiate and have a persistent erection firm enough to have satisfying sexual intercourse. The prevalence of erectile dysfunction in diabetic men is considerably high, but it is often underdiagnosed and under-managed. Objective: This study aimed to determine erectile dysfunction and associated factors among diabetic patients at, Hawassa, Southern, Ethiopia.

#### Methods

The institution-based cross-sectional study was conducted on 352 adult male diabetic patients randomly selected from Adare general and Hawassa comprehensive specialized hospitals using a simple random sampling technique. The number of patients to be selected from each hospital was proportionally assigned based on the total population of diabetes mellitus patients following chronic care during the study period. The descriptive statistics and multiple logistic regressions (bivariate and multivariate analysis) were carried out.

#### Result

The prevalence of erectile dysfunction was 72.2% (95%CI, 1.76–3.68). After adjusting all factors, old age, diabetes duration, drinking alcohol, and poor glycemic control had shown significant association with erectile dysfunction.

#### Conclusion

The occurrence of erectile dysfunction in this study community is very high. Drinking alcohol, poor glycemic control, age, and duration of diabetes were predictors of erectile dysfunction in this study area. Assessment and management of erectile dysfunction in the diabetic clinic should be part of routine medical care during follow-up visits with diabetic patients. Healthcare providers should emphasize screening and treating older patients and those who have had a diabetes diagnosis for a longer duration.

Tera, A., Getachew, T., Melesse, A., Rekik, M., Rischkowsky, B., Mwacharo, J. M., Abate, Z., & Haile, A. (2021). Estimates of genetic parameters and trends for reproduction traits in Bonga sheep, Ethiopia. *Tropical Animal Health and Production*, 53(1). Scopus. https://doi.org/10.1007/s11250-020-02445-w

#### Abstract

Investigation was carried out to assess the effects of environmental factors and to estimate genetic parameters and trends for reproductive traits in Bonga sheep, Ethiopia. Animals used in this study were managed by two communities involved in a community-based breeding programs (CBBPs) from 2009 to 2018. The database consisted of 15,595 individual phenotypic information from about 1500 ewes with variable number of records for each trait. The traits analyzed were age at first lambing (AFL), lambing interval (LI), and litter size (LS). Fixed effect analysis was done using the general linear model procedures of SAS. The Average Information Restricted Maximum Likelihood method of WOMBAT, fitting univariate animalmodel, was used to estimate heritabilities, repeatabilities and breeding values. Results showed that Bonga sheep had overall mean AFL, LI, and LS of  $453 \pm 109$  days,  $254 \pm 51$  days, and  $1.43 \pm 0.008$ , respectively. All traits were influenced (p < 0.01) by lambing year, lambing season, breeder communities, and parity of ewes. Estimates of heritability for AFL, LI, and LS were  $0.015 \pm 0.143$ ,  $0.009 \pm 0.070$ , and 0.085 $\pm$  0.110, respectively. The low heritabilities for the traits are expected and indicate low possibility of achieving rapid genetic progress through phenotypic selection. The repeatability estimates for LI and LS were low (0.109 and 0.196, respectively) indicating that non-genetic factors had significant influence to the variation in these traits among parities; therefore, selection decision on ewes should consider repeated records. The genetic trend for AFL, LI, and LS over the years was significant (p < 0.01). Positive values for LS and negative for AFL and LI were recorded, implying that the well-structured CBBPs have resulted in measurable genetic gains for the reproductive traits.

Wegi, T., Hassen, A., Bezabih, M., Nurfeta, A., Yigrem, S., & Tolera, A. (2021). Estimation of feed intake and digestibility in Zebu type Arsi steers fed natural pasture using the n-alkane technique. *Animal Feed Science and Technology*, 271. Scopus. https://doi.org/10.1016/j.anifeedsci.2020.114765

#### Abstract

An experiment was conducted to validate the use of n-alkanes technique to estimate feed intake and digestibility in cattle under the sub-humid tropical conditions. The experiment was conducted using Zebu type Arsi steers fed natural pasture at different levels of dry matter (DM) intake (DMI). Eight steers, blocked into four groups based on body weight (BW), were used for the experiment. The steers in each group were randomly assigned to either low intake (11 g DM/kg BW) or high intake (ad libitum at 50 g refusal per kg diet offered) diet. The steers were housed in individual pens, and each steer was dosed twice daily with paper bung containing 400 mg C32 alkane using a balling gun for 15 days. Steers received pasture diets twice a day (at 8:00 and 16:00 h) with half of the daily allocation offered at each feeding. Feed intake, refusal, and total fecal outputs were recorded, weighed and sub sampled for proximate and n-alkane concentrations analysis. The oddchain n-alkanes comprised the highest percentage during both wet and dry seasons. The alkanes C29, C31 and C33 were present in concentrations greater than 59 mg/kg DM in the two seasons. The mean fecal recovery rates ranged from 0.49 to 0.79 for low and 0.62 to 0.99 for high intake group, respectively during the wet season, whereas 0.68 to -1.05 for low and 0.61 to 0.9 for high intake group during the dry season, respectively. The DMI predictions using the double n-alkane technique were affected by season (P < 0.05) after fecal recovery correction. The C31/C32 and C33/C32 pairs accurately estimated the DMI regardless of intake levels during the wet season. During the dry season, the prediction for the low intake level improved after feacal recovery corrections, whereas that for the high intake level was accurate both with and without fecal recovery corrections. Moreover, using C35 alkane as internal marker provided an accurate estimate of DM digestibility (DMD) during both seasons for low intake group. The results obtained in this study confirm the accuracy of the n-alkane markers to estimate DMI and DMD in cattle consuming different levels of wet and dried pasture. However, accuracy can be reduced for digestibility estimation at higher levels of intake which need further validation.

Mahela, O. P., Sharma, Y., Ali, S., Khan, B., & Padmanaban, S. (2021). Estimation of Islanding Events in Utility Distribution Grid with Renewable Energy Using Current Variations and Stockwell Transform. *IEEE Access*, 9, 69798–69813. Scopus. https://doi.org/10.1109/ACCESS.2021.3078315

#### Abstract

This research work has designed an algorithm to identify islanding events using the current signals in a distribution grid interfaced with renewable energy (RE) sources situated in remote areas. A median-based islanding recognition factor (MIRF) is designed by processing the current signal using Stockwell transform (ST). A current rate of change of islanding recognition factor (CRCIRF) is computed by differentiating the root mean square (RMS) current concerning time. The MIRF and CRCIRF are multiplied element by element to calculate the current-based islanding recognition factor (IRFC) used to recognize islanding events and non-islanding events. Simple decision rules are used to discriminate Islanding events from the faulty and the operational events by comparing peak magnitude of IRFC with pre-set threshold values. This IDM effectively recognizes islanding events in the presence of noise with 10 dB signal-to-noise ratio (SNR) level. The performance of IDM is established on a practical distribution feeder. Developed work is executed in MATLAB/Simulink.

### Birkie, E. B. (2021). Ethnolinguistic perception and identity in Gurage. In Ado D., Gelagay A.W., & Johannessen J.J. (Eds.), *IMPACT Stud. Lang. Soc.* (Vol. 48, p. 118). John Benjamins Publishing Company; Scopus. https://doi.org/10.1075/impact.48.04bek

#### Abstract

This study was conducted with the objectives of exploring the perceptions and attitudes of speakers towards language use and ethnolinguistic identity within the complex sociopolitical and linguistic milieu of the Gurage people in Southern Nations, Nationalities and Peoples Regional State (SNNPRS) of Ethiopia. In so doing, five out of twelve groups with relatively different backgrounds were systematically selected for the study. Data was collected concurrently via questionnaires and semi-structured in-depth interviews involving a total of 386 participants. Respondents were asked to express their perceptions of the associations of language and ethnicity, and feelings about belongingness to the Gurage identity. The concurrent research design was informed by pragmatism

as a theoretical framework, so findings of the mixed methods approach were integrated at the end for comparative descriptive analyses. The empirical data reveal that there is an observably different pattern of perceived association of language and ethnicity and varying senses of belongingness to the common Gurage identity across sampled groups.

Bati, T. B., & Workneh, A. W. (2021). Evaluating integrated use of information technologies in secondary schools of Ethiopia using design-reality gap analysis: A school-level study. *Electronic Journal of Information Systems in Developing Countries*, 87(1). Scopus. https://doi.org/10.1002/isd2.12148

#### Abstract

The purpose of this study was to examine the level of readiness of Ethiopian secondary education systems in terms of access to technologies and preparedness in skills and motivation for the integrated use of information communication technologies (ICT) for quality education. To serve this end, a Design-Reality Gap Analysis approach was employed. Relevant data were collected from teachers, students, and school leaders through a questionnaire survey, and the result was cross-examined against the national goals and strategies. The Design-Reality Gap Analysis of integrated use of ICT in classroom teaching in Ethiopian secondary schools thus far revealed fewer successes and widespread challenges in the country's discourse to achieve the 2016-2020 national targets. The study showed that students have better access to mobile phones and other technologies at home and outside of schools. Major school-level factors for the gap observed were delay in implementation of a nationwide e-cloud based ICT infrastructure, lack of coordination for the pedagogical use of ICT, and insufficient capacity building training for teachers and school leaders. This suggests the importance of a strategy that integrates inside- and outside of schools ICT resources and services for improved use of ICT in student learning.

Betela, B., & Wolka, K. (2021). Evaluating soil erosion and factors determining farmers' adoption and management of physical soil and water conservation measures in Bachire watershed, southwest Ethiopia. *Environmental Challenges*, 5. Scopus. https://doi.org/10.1016/j.envc.2021.100348

#### Abstract

Soil degradation due to erosion, which emanates from improper land management, has been one of major challenges affecting agricultural production and food security. To control soil erosion, soil and water conservation (SWC) measures including soil and stone bunds have been developed and adopted. However, little is known on the impacts of SWC techniques in Africa. Objective of this study was to assess soil erosion and analyze effect of physical SWC measures on cropland productivity. Data were collected using focus group discussion, key informant interview and survey of 169 farm households (122 adopters and 47 non-adopters of physical SWC). Farmers were responded on soil erosion (rill and gully) and its impacts, long existed indigenous erosion mitigation measures as well as effects of introduced physical SWC techniques such as soil and stone bunds. Descriptive statistics and binary logistic regression model were used to analyze data. Based on visible erosion features such as rills and gullies, about 92% of respondents indicated that soil erosion is a major problem on cultivated land, where 64% of the farmers abandoned part of their plot due to exhausted soil fertility and gully development. About 97% of the farmers perceived that soil erosion reduces crop production. Traditional drainage ditch, grass strip and contour furrow are common indigenous SWC measures. More than 86% of the respondents believe that the introduced physical SWC measures (e.g., bunds) reduce erosion and improve crop production. Family size, participation in technical training, access to extension service, the perceived land tenure security, slope of the plot, and perceived severity of erosion had significant (p < 0.05) and a positive association with adoption of introduced physical SWC measures, while farm size had significant (p < 0.05) negative relationship. Increasing knowledge and skill of farmers, providing technical and resource supports and implementing appropriate policy could help sustainable land management that ensure environmental quality and food security in the study area as well as in the other areas having related biophysical and socioeconomic settings.

Sugebo, B., Demrew, Z., Feleke, S., & Biazen, M. (2021). Evaluation and characterization of rubber seed oil for biodiesel production. *Biomass Conversion and Biorefinery*. Scopus. https://doi.org/10.1007/s13399-021-01900-4

#### Abstract

The aim of the present study was to optimize oil yield from the rubber tree seed, determine the physicochemical properties of the oil, and synthesize and characterize the biodiesel from the oil. The oil was extracted by solvent extraction method and optimized using central composite design of response surface methodology. The oil physicochemical properties were determined using Association of Official Analytical Chemists (AOAC) procedure. The biodiesel was synthesized in a two-step acid–base catalyzed transesterification with 6:1 molar ratio of methanol to oil at 60 °C for 90 min. Fatty acid compositions of the biodiesel were determined using gas chromatography–mass spectrometry method. The maximum oil yield of 61.3 wt% was obtained with 9:1 solvent to solute ratio, extracted at 95 °C for 8 h. The physicochemical properties of the oil were suitable for biodiesel production and a maximum biodiesel yield of 81.55 wt% was obtained from the oil. The fuel properties of the biodiesel from the rubber seed oil was in line with the standards of ASTM6751 and EN590. The synthesized biodiesel was composed of 83.4% unsaturated and 16.1% saturated fatty acids. Unsaturated fatty acid composition could decrease the oxidation stability of the fuel. The present work indicates that rubber seed can be considered as important feedstock for biodiesel.

Muzemil, S., Chala, A., Tesfaye, B., Studholme, D. J., Grant, M., Yemataw, Z., Mekonin, S., & Olango, T. M. (2021). Evaluation of 20 enset (Ensete ventricosum) landraces for response to Xanthomonas vasicola pv. Musacearum infection. *European Journal of Plant Pathology*, *161*(4), 821–836. Scopus. https://doi.org/10.1007/s10658-021-02365-x

#### Abstract

Xanthomonas wilt, caused by Xanthomonas vasicola pv. musacearum (Xvm), formerly X. campestris pv. musacearum, is the most threatening and economically important disease of enset (Ensete ventricosum), the multipurpose food security crop orphan in south and southwestern Ethiopia. Xvm has also had a major impact on banana and plantain production in east Africa

following its detection in Uganda in 2001 and subsequent spread. The only current effective control of this disease relies on integrated disease management strategies including minimizing field pathogen inoculum and deployment of wilt-resistant enset landraces. Identifying landraces with stable and durable Xvm resistance will greatly accelerate breeding programmes. While previous reports have identified landraces with varying degrees of tolerance to Xvm, no systematic study has collectively assessed their relative resistance. Here we undertook a detailed "common garden" analysis of 20 enset landraces previously reported to exhibit lower susceptibility to Xvm using an aggressive Xvm inoculum isolated from a disease hotspot area. Detailed longitudinal and survival analyses were applied to each landrace, using a combination of area-under-disease progress stairs, disease index and apparent infection rate to capture disease metrics as well as disease progression symptoms. Considerable variation was observed among the 20 landraces; however, none exhibited full immunity to Xvm infection. Landraces Haella, Mazia and Lemat showed the lowest susceptibility to Xvm as evidenced by reduced disease units and higher survival rates compared to the susceptible control landrace Arkiya, which exhibited the highest infection level and lowest survival rate, consistent with a high degree of susceptibility to Xvm. Thus, we have in this controlled experiment identified new material suitable for incorporation into future breeding programmes to develop Xvm-resistant enset varieties.

Meenakshi, C. M., Ravi, R., Stephen Leon, J., Selvaraj, M., Manikandan, K., Suresh, G., & Lavanya, R. (2021). Evaluation of improvement in performance of FRP composite by using Al (OH3) as secondary reinforcement. 1921(1). Scopus. https://doi.org/10.1088/1742-6596/1921/1/012092

#### Abstract

Composites are the materials of this century, and it uses are predominately occupied in all areas, starts from kitchen utilities to aerospace sectors. Among different type of composite materials, the fiber reinforced polymeric (FRP) composite materials are the most used and accepted one. There are many researches undergoing to further improve the performance of these fiber reinforced polymeric composites. One of the proven methods for performance improvement is adding secondary reinforcement into the base matrix material. There are different types of secondary reinforcement like rice husk, MgCO3, Boron nitride powders, which are often used and their

respective performance recorded by different researchers. In this work, laminate of size 300 X 300 mm with 3 mm thickness fabricated using hand layup method in which epoxy has been chosen as the base matrix material. The laminate consisting of 3 layers (Glass-Flax-Glass) with 2% wt of Al (OH3) as secondary reinforcement and compared with the mechanical properties without using secondary reinforcement. From the result we understood that the tensile strength and flexural strength of laminate is increased by the addition of secondary reinforcement.

Mohan, S. K., Ganesan, A. T., Ramarao, M., Mangrulkar, A. L., Rajesh, S., Al Obaid, S., Alfarraj, S., Sivakumar, S., & Ganesan, M. (2021). Evaluation of Mechanical Properties of Sisal and Bamboo Fibres Reinforced with Polymer Matrix Composites Prepared by Compression Moulding Process. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/2832149

#### Abstract

Today's modern, dynamic world would be impossible to imagine without the concept of composite material advancement. Various studies are being conducted in this area in order to reach the desired level. In terms of compatibility, natural fibre reinforced polymer-based composites and synthetic fibre composites are very similar. Because they are lightweight, nontoxic, and nonabrasive, they are very popular with consumers. They are also readily available and affordable. Composite materials made from natural fibre have superior mechanical properties compared to those made from synthetic fibre. As part of this research, an epoxy-based composite with bamboo and sisal fibre reinforcement is examined. Reinforced with epoxy resin, bamboo fibre and sisal fibre are used to make composite materials. The effect of adding bamboo fibre and sisal fibre in various weight percentages on the mechanical behaviour of composites is investigated.

Lencha, S. M., Ulsido, M. D., & Muluneh, A. (2021). Evaluation of seasonal and spatial variations in water quality and identification of potential sources of pollution using multivariate statistical techniques for Lake Hawassa Watershed, Ethiopia. *Applied Sciences (Switzerland)*, *11*(19). Scopus. https://doi.org/10.3390/app11198991

#### Abstract

The magnitude of pollution in Lake Hawassa has been exacerbated by population growth and economic development in the city of Hawassa, which is hydrologically closed and retains pollutants entering it. This study was therefore aimed at examining seasonal and spatial variations in the water quality of Lake Hawassa Watershed (LHW) and identifying possible sources of pollution using multivariate statistical techniques. Water and effluent samples from LHW were collected monthly for analysis of 19 physicochemical parameters during dry and wet seasons at 19 monitoring stations. Multivariate statistical techniques (MVST) were used to investigate the influences of an anthropogenic intervention on the physicochemical characteristics of water quality at monitoring stations. Through cluster analysis (CA), all 19 monitoring stations were spatially grouped into two statistically significant clusters for the dry and wet seasons based on pollution index, which were designated as moderately polluted (MP) and highly polluted (HP). According to the study results, rivers and Lake Hawassa were moderately polluted (MP), while point sources (industry, hospitals and hotels) were found to be highly polluted (HP). Discriminant analysis (DA) was used to identify the most critical parameters to study the spatial variations, and seven significant parameters were extracted (electrical conductivity (EC), dissolved oxygen (DO), chemical oxygen demand (COD), total nitrogen (TN), total phosphorous (TP), sodium ion (Na+), and potassium ion (K+) with the spatial variance to distinguish the pollution condition of the groups obtained using CA. Principal component analysis (PCA) was used to qualitatively determine the potential sources contributing to LHW pollution. In addition, three factors determining pollution levels during the dry and wet season were identified to explain 70.5% and 72.5% of the total variance, respectively. Various sources of pollution are prevalent in the LHW, including urban runoff, industrial discharges, diffused sources from agricultural land use, and livestock. A correlation matrix with seasonal variations was prepared for both seasons using physicochemical parameters. In conclusion, effective management of point and non-point source pollution is imperative to improve domestic, industrial, livestock, and agricultural runoff to reduce pollutants entering the Lake. In this regard, proper municipal and industrial wastewater treatment should be complemented, especially, by stringent management that requires a comprehensive application of technologies such as fertilizer management, ecological ditches, constructed wetlands, and buffer strips. Furthermore, application of indigenous aeration practices such as the use of drop structures at critical locations would help improve water quality in the lake watershed.

Lambebo, M. K., Kifle, Z. D., Gurji, T. B., & Yesuf, J. S. (2021). Evaluation of wound healing activity of methanolic crude extract and solvent fractions of the leaves of vernonia auriculifera hiern (Asteraceae) in mice. *Journal of Experimental Pharmacology*, *13*, 677–692. Scopus. https://doi.org/10.2147/JEP.S308303

#### Abstract

#### Background

Medicinal plants play an important role in treating various diseases. Vernonia auriculifera Hiern is one of the medicinal plants used traditionally for the management of wounds. However, there were no scientific reports documented so far on the wound healing activities to substantiate the claim. Thus, the present study provides a scientific evaluation for the wound healing potential of the crude extract as well as solvent fractions of the leaves of Vernonia auriculifera Hiern.

#### Methods

Extraction was carried out by maceration using 80% methanol and part of the crude extract fractionated with chloroform, ethyl acetate, and aqueous solvents. Simple ointment bases were prepared using hard paraffin, cetostearyl alcohol, white soft paraffin and wool fat according to British Pharmacopoeia. Then, two types of ointment formulations were prepared from the extract, ie, 5% w/w and 10% w/w. Mice and rats were employed for wound healing study and dermal toxicity test, respectively. Wound healing effects were evaluated by percent of wound contraction, period of epithelialization, tensile strength, and histological analysis as parameters in excision, incision, and burn wound models. Finally, the data were expressed as mean  $\pm$  SEM, and the results were analyzed using one-way ANOVA followed by post hoc Tukey-test.

#### Results

In the excision wound model, the 10% w/w crude extract ointment showed significant wound contraction (P < 0.001) from day 4 to day 18 as compared to the negative control. Both the 5%

w/w (P < 0.001) and 10% w/w (P < 0.05) crude extract ointments have showed statistically significant difference in epithelialization period as compared to the negative control. Groups treated with the ethyl acetate and aqueous fractions ointments in incision wound model showed a statistically significant (P < 0.001) increase in tensile. The 10% w/w and 5% w/w ointments of the crude extract showed a significant (P < 0.001) increase in breaking strength compared to simple ointment and the untreated control groups. In burn wound model, significant reduction in epithelialization period was observed in 5% w/ w (P < 0.05) and 10% w/w (P < 0.001), and the percentage of wound contraction was significantly increased in most of post wounding days by 10% w/w (P < 0.001) and 5% w/w (P < 0.05) crude extract ointments and compared to the negative control.

#### Conclusion

The crude, aqueous, and ethyl acetate fraction of Vernonia auriculifera leaves possess wound healing activities. This finding justifies the use of the leaves of this plant for wound healing as claimed in the traditional medicine literature.

Fikadu, A. A., & Gebre, G. G. (2021). Evidence from Fogera district in Ethiopia on configuration of farmer's information literacy conditions that explain better productivity performance of the horticultural crops. *Agriculture and Food Security*, 10(1). Scopus. https://doi.org/10.1186/s40066-021-00299-5

#### Abstract

#### Background

The combinational/configurational effects of the agricultural information literacy indicators are believed to have an influence on the productivity performance of the horticultural crops. Previous studies have emphasized the contributions of the net-effect of each information literacy condition of smallholder farmers on the productivity performance of the horticultural

crops. Yet, these studies failed to make qualitative analysis on configurational effects of the agricultural information literacy conditions.

#### Methods

The study addresses the qualitative questions that are outside the scope of the conventional variable-oriented method. It aims to disentangle the causal complexity that links with productivity

performance in Fogera district of the Amhara region, Ethiopia. A fuzzy-set qualitative comparative analysis (fsQCA) of 80 smallholder farmers was conducted through a simple ransom sampling technique from two kebeles of Fogera district to examine the combinational effects of agricultural information literacy condition on the productivity performance instead of individual net-effect.

#### Results

The results of the fsQCA model indicated that a combination of two or three conditions include the high levels of farm organizational, farm record-keeping, and farming skills to be consistently sufficient to attain high productivity performance of horticultural crops. These configurations help to seek relevant policy information and make policy strategies on the horticultural sector to improve its productivity performance.

#### Conclusion

Thus, improving the joint information literacy effects of the farmers regarding their organizational, farm recording, and farming skills should give due attention by governmental and non-governmental organizations that work to improve the productivity performance of the horticultural crops.

Elias, E., Tsegaye, W., Stoecker, B. J., & Gebreegziabher, T. (2021). Excessive intake of iodine and low prevalence of goiter in school age children five years after implementation of national salt iodization in Shebedino woreda, southern Ethiopia. *BMC Public Health*, *21*(1). Scopus. https://doi.org/10.1186/s12889-021-10215-y

#### Abstract

#### Background

Iodine is a trace element required for the synthesis of thyroid hormones. The multiple effects of iodine deficiency on human health are called iodine deficiency disorders (IDDs). IDDs have been common nutritional problems in Ethiopia. In 2012, Ethiopia launched a national salt iodization program to address IDDs. The objective of this study was to assess the effects of this program after 5 years by measuring urinary iodine concentration (UIC) and prevalence of goiter in school age children as well as household salt iodine concentration (SIC).

#### **Methods**

A school-based cross-sectional design was employed. After ethical approval, 408 children from eight randomly selected primary schools provided urine samples. UIC was analyzed by inductively

coupled plasma mass spectrophotometry (ICP-MS). A 10 g salt sample was collected from each household of a sampled child. SIC was analyzed with a digital electronic iodine checker (WYD, UNICEF) and goiter was assessed by palpation.

#### Results

The mean ( $\pm$ SD) age of the children was 9  $\pm$  2 years. The prevalence of goiter was 4.2% and no child had grade 2 goiter. The median (IQR) UIC was 518 (327, 704) µg/L and UIC ranged from 3.1 to 2530 µg/L. Of the salt samples, 15.6% were not adequately iodized (< 15 ppm), 39.3% were adequately iodized ( $\geq$ 15 to  $\leq$ 40 ppm), and 45.1% were > 40 ppm. SIC ranged from 4.2 to 195 ppm. Of the mothers, 92% said iodized salt prevents goiter and 8% mentioned prevents mental retardation.

#### Conclusions

In 2017 iodine deficiency was no longer a public health problem in the study area. However, the high variability in UIC and SIC and excessive iodine intake are of great concern. It is vital to ensure that salt is homogenously iodized at the production site before being distributed to consumers.

Getaneh, T., Negesse, A., & Dessie, G. (2021). Experiences and reasons of attrition from option b+ among mothers under prevention of mother to child transmission program in northwest ethiopia: Qualitative study. *HIV/AIDS - Research and Palliative Care*, *13*, 851–859. Scopus. https://doi.org/10.2147/HIV.S314306

#### Abstract

#### Background

Human immunodeficiency virus-infected children share the highest risk of death compared with all other age groups, and more than 90% of this viral infection of children was accounted for by transmission from mother to infant. This rate can be prevented and reduced with implementation of option B+ effectively. However, unacceptably high lost follow-up of mothers highly affected the effectiveness of this program. In Ethiopia, only 71% of mothers were adherent on their follow-up. So, this study was aimed to understand the reasons and experiences of lost follow-up of mothers under the prevention of mother to child transmission (option B+) program in North West Ethiopia.

#### Methods

A qualitative study using a case study design was carried out using in-depth interviews among 20 mothers who had started the option B+ treatment protocol but discontinued their follow-up for more than two months, and 6 key informants and individuals who were engaged in management and control of human immunodeficiency virus at Woreda and Zonal level. An unstructured interview guide was used and translated into the local language. Study participants were selected using purposive sampling technique. After written consent was obtained, all study participants' interviews were audio-recorded and analyzed using deductive content analysis.

#### Results

A total of 26 mothers participated in this study. Accordingly, the most frequently raised reasons were lack of formal education which affects income level, lack of disclosure, lack of partner and family support, absence of male involvement and stigma-discrimination. But, unavailability of option B+ regimens in the nearest health facility or long distance from health facility, discordance and lack of experienced professionals in terms of counseling during initiation were also essential reasons.

#### Conclusion

Educational and economic empowerment intervention (particularly for vulnerable households), promoting family support and male involvement, active counseling at initiation and during follow up and community level awareness improvement should be addressed to increase option B+ regimen adherence and retention.

# Vijayan, D. S., Mohan, A., Jebasingh Daniel, J., Gokulnath, V., Saravanan, B., & Kumar, P. D. (2021). Experimental Investigation on the Ecofriendly External Wrapping of Glass Fiber Reinforced Polymer in Concrete Columns. *Advances in Materials Science and Engineering*, *2021*. Scopus. https://doi.org/10.1155/2021/2909033

#### Abstract

An ecofriendly fiber reinforced polymer (FRP) had been used in the last decade to enhance the short concrete column's strength and deformation capacity. This study involves the wrapping of FRP sheets with a thickness of 3 mm and 5 mm on a short column, and then the compressive strength is determined. The rectangular columns of size 150 mm  $\times$  300 mm are used for this study, and cast under the grades of M20 and M40 are wrapped with GFRP sheets at the

thickness of 3 mm and 5 mm. These results are clarified at a specific thickness of the FRP-wrapped columns. It provides a maximum axial compressive strength, and Young's modulus gets enhanced rigorously when it is to be compared to the normal concrete. This thesis deals with experimental studies of different parameters associated with wrapped glass fiber reinforced polymer (GFRP). In M20 grade, when the 3 mm wrapped specimen and the 5 mm wrapped specimen are compared, the specimen wrapped with 5 mm increases 5.182% more than the specimen wrapped with 3 mm. In M40 grade, when the 0 mm, 3 mm, and 5 mm wrapped specimens are compared, the specimen wrapped with 5 mm increases 2.47% more than the specimen wrapped with 0 mm. The 5 mm wrapping attains the maximum strength.

Agegnehu, G., Amede, T., Erkossa, T., Yirga, C., Henry, C., Tyler, R., Nosworthy, M. G., Beyene, S., & Sileshi, G. W. (2021). Extent and management of acid soils for sustainable crop production system in the tropical agroecosystems: A review. *Acta Agriculturae Scandinavica Section B: Soil and Plant Science*, 71(9), 852–869. Scopus. https://doi.org/10.1080/09064710.2021.1954239

#### Abstract

Increasing areas of agricultural land in high rainfall areas of Sub-Saharan Africa (SSA), where crop production used to be reliable, are affected by soil acidity. This review focuses on the extent, causes and effect of soil acidity on soil properties and crop yield and its management from the context of SSA. Studies showed that the detrimental effects of soil acidity can be mitigated through liming, integrated acid soil management and the use of acid-tolerant germplasms. Application of lime resulted in yield increments of 34–252% in wheat, barley and tef, 29–53% in faba bean and soybean, and 42–332% in potato in Ethiopia, 111–182% in maize in Kenya, and 45–103% in Mucuna in Nigeria under moderate to severe acid soil conditions. This was accompanied by a corresponding increase in soil pH up to 1.9 units and a decrease in exchangeable acidity and aluminum up to 2.1 cmol kg–1. Use of acid-tolerant crop varieties such as maize expressing superior tolerance to Al toxicity resulted in a yield increase of 51% under low soil pH in Cameroon and Kenya. Overall, soil acidity covering ~35% of SSA should be reclaimed with lime and integrated acid soil management interventions, which could significantly increase crop yield and enhance the resilience of the tropical agroecosystems.

Tekeba, A., Ayele, Y., Negash, B., & Gashaw, T. (2021). Extent of and Factors Associated with Self-Medication among Clients Visiting Community Pharmacies in the Era of COVID-19: Does It Relieve the Possible Impact of the Pandemic on the Health-Care System? *Risk Management* and *Healthcare Policy*, *14*, 4939–4951. Scopus. https://doi.org/10.2147/RMHP.S338590

#### Abstract

#### Background

Self-medication is one aspect of self-care that has been shown to benefit primary health care. When done correctly, it provides significant benefits to customers, such as selfreliance and cost savings. Inappropriate methods, on the other hand, such as incorrect selfdiagnosis and therapy selection, can be disastrous. The COVID-19 pandemic context may benefit the community in easing the burden on the health system. There have been no studies conducted on this possibility in the context of COVID-19 in a selected area, hence the purpose of this study was to determine the extent of and factors associated with self-medication among clients visiting community pharmacies in west Harerghe, Ethiopia from June 1 to 30, 2020.

#### Methods

This institution-based cross-sectional study used a systemic random sample of 416 communitypharmacy clients. To collect data, face-to-face interviews were conducted using pretested semistructured questionnaires modified from established techniques. EpiData 3.1 was used to enter data and SPSS 24 for analysis. To determine factors associated with self-medications, bivariate and multivariate logistic regression analyses were performed. AORs with 95% CIs are used to report associations, and the level of significance was set at P<0.05.

#### Results

The proportion of people self-medicating was 73.6% (95% CI 69.2% –77.9%). Self-medications were significantly associated with age 18–24 years (AOR 9.28, 95% CI 3.56–24.21) and 25–34 years (AOR 3.54, 95% CI 1.35–9.27), Amhara ethnicity (AOR 1.72, 95% CI 1.01–2.94), current single status (AOR 0.28, 95% CI 0.15–0.51), government employment (AOR 0.31, 95% CI 0.12–0.82), and limited knowledge (AOR 2.31, 95% CI 1.40–3.79).

#### Conclusion

Three in four participants practiced self-medication in the era of COVID-19. Repetition was significantly associated with age, ethnicity, current marital status, type of occupation, and

knowledge about self-medications. An alternative medical care-delivery system by all health-care providers and increasing community awareness should be promoted.

Ewunie, G. A., Morken, J., Lekang, O. I., & Yigezu, Z. D. (2021). Factors affecting the potential of Jatropha curcas for sustainable biodiesel production: A critical review. *Renewable and Sustainable Energy Reviews*, 137. Scopus. https://doi.org/10.1016/j.rser.2020.110500

#### Abstract

Scarcity, insecurity, and severe environmental impact of fossil fuel-based energy consumption have enthused the production and utilization of alternative energy resources. Biodiesel is identified as promising renewable energy that can substitute the petrol diesel consumption with numerous advantages. However, more than 95% of biodiesel is produced from edible oil crops, which jeopardizes the food supplies. As a result, exploring inexpensive and non-edible oil-bearing energy crops such as Jatropha curcas (Jatropha) has been the target of governments, researchers, industries, and policymakers. However, sustainable biodiesel production from this plant is not achieved yet due to various ecological, socioeconomic, legislative, and technological factors. Previous reports showed that the individual impact of those factors; however, all factors are strongly correlated, and the impact of one factor is significantly affected by the situation of other factors. Therefore, the present review is devoted to critically examine and discuss the sole and interactive effect of various factors affecting the cultivation of Jatropha for sustainable biodiesel production by reviewing more than 185 published articles. Various oil extraction and biodiesel production technologies and factors affecting the physicochemical properties of Jatropha oil and biodiesel were profoundly investigated. Moreover, the performance, combustion, and emission characteristic of diesel engines fuelled with Jatropha biodiesel were carefully reviewed and compared with petrol diesel. In conclusion, factors affecting the sustainable biodiesel production potential of Jatropha vary across growing regions due to variation in determinants, and the performance and emission characteristic of diesel engines fuelled with Jatropha biodiesel slightly differed from petrol diesel.

Atsbeha, A. T., & Gebre, G. G. (2021). Factors Affecting Women Access to AgriculturalExtension Services: Evidence from Poultry Producer Women's in Northwestern Tigray,Ethiopia.CogentSocialSciences,7(1).Scopus.https://doi.org/10.1080/23311886.2021.1975413

#### Abstract

Rural poultry production is an appropriate system for supplying the fast-growing human population with quality food and provides additional income to resource-poor farmers, especially women to improve their livelihoods. The main objective of this study was to identify factors that affect the access of women to poultry extension services in Northwestern, Tigray, Ethiopia. Multistage sampling techniques based on probability proportional to size were used to select districts, tabia (peasant association) and women poultry producers in the Northwestern Tigray. Variables on socio-economic characteristics of women poultry producers, access to information, access to training, access to credit service and times of visit by extension agents were generated from primary data collected from the study area. Data were subjected to logit econometric regression analysis. The result of the logistic regression model estimate revealed that out of the 10 factors, 6 variables were found to have a significant influence on the probability of women's access to poultry extension service. These variables included household size, age of women, farmland size, information about poultry extension service, number of visits by extension agent and access to poultry production training. The coefficients of access to information about poultry extension service and the number of visits by extension agent were statistically significant at 1% probability level of significance, whereas household size, age of women poultry producers, farmland size and access to poultry production training were statistically significant at 5% probability level of significance.

Debele, T. Z., Cherkos, E. A., Badi, M. B., Anteneh, K. T., Demssie, F. W., Abdo, A. A., & Mihret, M. S. (2021). Factors and outcomes associated with the induction of labor in referral hospitals of Amhara regional state, Ethiopia: A multicenter study. *BMC Pregnancy and Childbirth*, 21(1). Scopus. https://doi.org/10.1186/s12884-021-03709-5

#### Abstract

#### Background

Induction of labor is an artificial initiation of uterine contractions after fetal viability with the aim of vaginal delivery prior to the onset of spontaneous labor. Prevalence of induction of labor is increasing worldwide with subsequent increase in failure rate. However, there is limited evidence on labor induction in Ethiopia. Therefore, this study was aimed at assessing the prevalence and associated factors of failed induction of labor among women undergoing induction of labor at referral hospitals of Amhara national regional state, Ethiopia, 2016.

#### Method

A multicenter cross-sectional study was conducted at referral hospitals found in Amhara national regional state from February 01 to September 30, 2016. Multistage sampling technique was employed to select a total of 484 women who underwent labor induction. Pre-tested structured questionnaires and checklists were used to collect the data. Data were entered into EPI info version 7 and analyzed using SPSS version 20 software. Stepwise Binary Logistic regression model was fitted to identify factors associated with failed induction of labor. The level of significance was determined based on the adjusted odds ratio with 95% confidence interval at the p-value of  $\leq 0.05$ .

#### Result

The prevalence of failed induction of labor among women undergoing induction of labor was 31.4% (95% CI: 27.0, 36.0). Failed induction of labor was independently predicted by a Bishop score of  $\leq 5$  (AOR = 2.1; 95% CI: 1.3, 3.6), prolonged latent first stage of labor (AOR = 2.0; 95% CI: 1.2, 3.5), induction with oxytocin alone (AOR = 4.2; 95% CI: 2.2, 8.1), nulliparity (ARO = 1.9; 95% CI: 1.2, 2.9), post term pregnancy (AOR = 4.1; 95% CI: 1.8, 9.3) and hypertensive disorder of pregnancy (AOR = 2.4; 95% CI: 1.5, 5.1).

#### Conclusion

Failed induction of labor was high in the study area compared to the reports of previous studies done in Ethiopia. The majority of the determinants of failed induction of labor were connected

with unjustifiable and inconsistent indication of induction of labor. Thus, preparing standardized practical guidelines and preventing unjustifiable case selection may help reduce the current high failure rates.

# Borsamo, A., Oumer, M., Asmare, Y., & Worku, A. (2021). Factors associated with delay in seeking treatment among women with pelvic organ prolapse at selected general and referral hospitals of Southern Ethiopia, 2020. *BMC Women's Health*, 21(1). Scopus. https://doi.org/10.1186/s12905-021-01245-0

#### Abstract

Background: Pelvic organ prolapse (POP) is the descent of the vaginal wall, cervix, uterus, bladder, and rectum downward into the vaginal canal. Its prevalence is higher among women in developing countries because women are more prone to risk factors. In Ethiopia, women with prolapse seek treatments at advanced stages of prolapse; hence, surgical management has been widely practicing. Therefore, it was found to be very important to conduct research that assesses factors hindering early treatments in Southern Ethiopia. This study aimed to find out factors associated with the delay in seeking treatment of pelvic organ prolapse among patients at selected general and referral hospitals of Southern Ethiopia. Methods: Cross-sectional study design was employed in 123 participants of seven randomly selected General and Referral Hospitals of Southern Ethiopia from February 01 to April 30, 2020, by using a structured questionnaire. Pretrained two midwives in each center were deployed to collect data. Physicians performed diagnosis and physical examination. Data were entered and coded using EPI INFO version 7 and exported into SPSS version 25 for analysis. Bivariate and multivariable logistic regression analyses were performed. The goodness of fit was assessed by using the Hosmer and Lemeshow goodness test. Results: In this study, out of 123 clinically diagnosed POP cases, nearly half of them were stage III, and over one-third were stage IV. Therefore, 84.6% (104 participants) of the respondents were delayed for the treatment of POP. The mean length of delay for POP treatments was  $36.41 \pm$ 3.95 months. After adjusting for covariates, lack of supports [AOR (Adjusted Odds Ratio) = 5.2(95% CI 1.4–19.5)], low-income [AOR = 5.8 (95% CI 1.1–19.66)], and fear of social stigma [AOR = 4.7 (95% CI 1.2-18.59)] were significant factors for delayed treatments. Conclusions: Most of the POP patients were delayed for POP treatments. Factors like lack of support, low-income, and fear of losing social value/stigma were associated with treatment delay. Screening for the POP

cases, educating (making awareness) the community about this devastating disease to facilitate early treatment and to avoid social stigma, and raising access to treatment by making the nearby hospitals equipped with facilities to treat POP are recommended.

Tafesse, T., Yoseph, A., Mayiso, K., & Gari, T. (2021). Factors associated with stunting among children aged 6–59 months in Bensa District, Sidama Region, South Ethiopia: Unmatched case-control study. *BMC Pediatrics*, 21(1). Scopus. https://doi.org/10.1186/s12887-021-03029-9

#### Abstract

#### Background

Stunting remains one of the most common malnutrition problems among children in Ethiopia. Identifying the risk factors of stunting assists health planners to prioritize prevention strategies, and is a fundamental step for intervention. Therefore, this study aimed to assess factors associated with stunting among children aged 6–59 months in Bensa district, Sidama Region, South Ethiopia, 2018.

#### Methods

A facility-based unmatched case-control study was conducted from January 10 to March 10, 2018, on a sample of 237(79 cases and 158 controls) children aged 6–59 months with their respective mothers/caretakers. Data were collected using a structured, face-to-face interviewer-administered questionnaire and standard physical measurements. The data were entered into EP INFO version 7 and WHO Anthro software and analyzed using SPSS version 20. The variables were entered into the multivariable model using the backward stepwise regression approach. Multivariable logistic regression analysis was used to identify factors associated with stunting. Adjusted odds ratio (AOR) with 95% confidence interval (95%CI) and p-value <0.05 was used to declare the significance.

#### Results

Sex distribution was almost equal (Males = 52.3%, Females = 47.7%). The mean (standard deviation) age of cases and controls was 27.35 ( $\pm$ 12.71) and 28.70 ( $\pm$ 13.27) months respectively. The risk factors for stunting were diarrhea in the past two weeks (AOR = 2.71, 95% CI: 1.42–5.16), being male (AOR = 2.37, 95% CI: 1.224–4.59), inappropriate exclusive breastfeeding (AOR = 2.07, 95% CI: 1.07–4.01), having less than or equal to three under-five children in the household

(AOR = 2.18, 95%CI: 1.03–4.64), and mothers who had no formal education (AOR = 3.28, 95%CI :1.56–6.924).

#### Conclusions

Diarrhea in the past two weeks, sex of a child, inappropriate exclusive breastfeeding, number of under-five children in the household, and mothers who had no formal education were the risk factors of stunting. Thus organized efforts aimed at focus on prevention of diarrhea as part of an overall public health strategy for improving child health and nutrition. Educating mothers/caretakers on the importance of exclusive breastfeeding should be considered. Moreover, mothers need to be encouraged to space birth between children through the use of family planning services.

## Beyene, H., Kassa, D. H., Tadele, H. D., Persson, L., Defar, A., & Berhanu, D. (2021). Factors associated with the referral of children with severe illnesses at primary care level in Ethiopia: A cross-sectional study. *BMJ Open*, *11*(6). Scopus. https://doi.org/10.1136/bmjopen-2020-047640

#### Abstract

Context and objective Ethiopia's primary care has a weak referral system for sick children. We aimed to identify health post and child factors associated with referrals of sick children 0-59 months of age and evaluate the healthcare providers' adherence to referral guidelines. Design A cross-sectional facility-based survey. Setting This study included data from 165 health posts in 52 districts in four Ethiopian regions collected from December 2018 to February 2019. The data included interviews with health extension workers, assessment of health post preparedness, recording of global positioning system (GPS)-coordinates of the health post and the referral health centre, and reviewing registers of sick children treated during the last 3 months at the health posts. We analysed the association between the sick child's characteristics, health post preparedness and distance to the health centre with referral of sick children by multivariable logistic regressions. Outcome measure Referral to the nearest health centre of sick young infants aged 0-59 days and sick children 2-59 months. Results The health extension workers referred 39/229 (17%) of the sick young infants and 78/1123 (7%) of the older children to the next level of care. Only 18 (37%) sick young infants and 22 (50%) 2-59 months children that deserved urgent referral according to guidelines were referred. The leading causes of referral were possible serious

bacterial infection and pneumonia. Those being classified as a severe disease were referred more frequently. The availability of basic amenities (adjusted OR, AOR=0.38, 95% CI 0.15 to 0.96), amoxicillin (AOR=0.41, 95% CI 0.19 to 0.88) and rapid diagnostic test (AOR=0.18, 95% CI 0.07 to 0.46) were associated with less referral in the older age group. Conclusion Few children with severe illness were referred from health posts to health centres. Improving the health posts' medicine and diagnostic supplies may enhance adherence to referral guidelines and ultimately reduce child mortality.

### Destaw, F., & Fenta, M. M. (2021b). Farmers' Perception on Climate Variability and its Effects in Ambassel District, Northern Ethiopia. *Agricultural Research*. Scopus. https://doi.org/10.1007/s40003-021-00573-9

#### Abstract

Ethiopia currently faces many critical climate-related challenges that affect the lives and livelihoods of smallholder farmers. It is important to understand how differently situated communities perceive climate variability. This study investigates farmers' perception of historical changes in climate and associated effects on agriculture in Ambassel District, Northern Ethiopia. The study was based on multi-stage sampling techniques to select the study area and 147 sample household respondents. Both primary and secondary data were used for data analysis. Primary data were collected through a household survey, focus group discussion and key informant interviews. The collected data were analyzed using descriptive statistics. We used regression model to determine the relationship between historical climate data and yield for food crops. Chi-square tests were also employed to compare the difference among agro-ecological zones. The results revealed that majority of the farmer's perceived changes in the level of local climate and experienced its effects over two decades. As a result, both crop and livestock production by smallholder farmers have already been adversely affected. The regression analysis revealed significant relationship between rainfall and crop yields, teff (Eragrostis tef) and sorghum, which was consistent with perceived impacts of climate variability on crop production. Significant relationship was also observed between maximum temperature and sorghum yield. Therefore, there is a need to introduce water-related interventions such as small-scale irrigation and water harvesting as a drought adaptation strategy.

Ayenew, A., Tolera, A., Nurfeta, A., & Assefa, G. (2021). Farmers' preference and knowledge on indigenous multipurpose browse species towards their feed value in north western Ethiopia. *Tropical and Subtropical Agroecosystems*, 24(1). Scopus. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85100292281&partnerID=40&md5=493588f26a348d0161d0a363ce7d07c8

#### Abstract

#### Background

Nowadays, in Ethiopia crop production is the dominant practice and indigenous browse species can make a large contribution to livestock feeding during dry season. However, few researches has been undertaken on the nutritional value of indigenous multipurpose browse species in this region, which means indigenous knowledge of multipurpose browse species is not strongly supported by scientific information.

#### Objective

A study was conducted in the highland and lowlands of north western Ethiopia, to assess farmers' preference criteria, farmer's preference between the indigenous multipurpose browse species and the relationship of farmers' knowledge of multipurpose browse species (MPBs) foraging value with laboratory result. Methodology. Group discussions, preference ranking and scoring by a total of 60 farmers were conducted in two agro-ecologies.

#### Result

The farmers' preference among MPB species which are browsed by cattle sheep and goat were determined considering availability, biomass yield, foraging value, palatability, multi-functionality and growth and re-growth ability. In the highland, the comparison among indigenous MPB species for their benefits and desired tree characteristics showed that farmers preferred Albizia gummifera for its availability and multi-functionality. In terms of feed value, growth and re-growth ability and palatability, the score for Vernonia amygdalina was higher than other MPB species. Ficus thonningii was preferred for its biomass yield. There was also a strong relationship between farmers' feed value score and laboratory results. Farmers were able to differentiate effectively MPB species that had high and low protein content and in vitro digestibility using their indigenous feed value indicator system. In lowland, the score for Ficus sycomorus followed by Piliostigma thonningii was higher for availability and Cordia africana was scored higher for multi-functionality and growth and re-growth ability. In terms of feed value and palatability, Piliostigma

thonningii has the highest score. Albizia malacophylla was preferred and rated highest for biomass yield. But, the laboratory indicators were non-correlated (P > 0.05) with the farmers' assessment of feed value score. Implication. The result of this study confirms that farmers have their own criteria to evaluate browse species and can differentiate the browse species that had high and low fiber content based on their indigenous knowledge.

#### Conclusion

Therefore, we conclude that when incorporating locally available resources, farmers' preference criteria and indigenous knowledge is vital to efficiently utilize indigenous MPB species and to tackle feed shortage in the study area.

## Zula, A. T., & Desta, D. T. (2021). Fatty Acid-Related Health Lipid Index of Raw and Fried Nile Tilapia (Oreochromis niloticus) Fish Muscle. *Journal of Food Quality*, 2021. Scopus. https://doi.org/10.1155/2021/6676528

#### Abstract

Fried food consumption is popular in most parts of the world including Ethiopia. Among many fried products available in Ethiopia, fried fish is most commonly consumed in Hawassa Town due to the easy access to the fish from the lake. Recently, there is growing concern among fryers to recycle the oil while frying fish. However, there is limited evidence about the frying effect on the fatty-acid-related health lipid index of fried fish. Thus, the study was aimed to determine the fatty acid profile and the fatty-acid-related health lipid of raw and fried fish. Raw and fried fish were taken from the Hawassa open fish market. Fatty acid profiles were analyzed using a gas chromatography-mass spectrophotometer (GCMS), and the health lipid index was determined by calculation using the recommended formula. JMP pro 13 version software was used for data analysis. Our result showed that raw fish had a high amount of essential fatty acid, nutritive value index, hypocholesterolemic ratio, and peroxidizability index. In contrary to this, the fried fish had a high amount of trans-fatty acids, nonessential fatty acids, atherogenic index, and thrombogenic index. In conclusion, the fried fish loses its fatty-acid-related nutritional quality in uncontrolled frying conditions. Therefore, frying needs to be controlled, as it risks human health otherwise.

Diwan, T. D., Choubey, S., Hota, H. S., Goyal, S. B., Jamal, S. S., Shukla, P. K., & Tiwari, B. (2021). Feature Entropy Estimation (FEE) for Malicious IoT Traffic and Detection Using Machine Learning. *Mobile Information Systems*, 2021. Scopus. https://doi.org/10.1155/2021/8091363

#### Abstract

Identification of anomaly and malicious traffic in the Internet of things (IoT) network is essential for IoT security. Tracking and blocking unwanted traffic flows in the IoT network is required to design a framework for the identification of attacks more accurately, quickly, and with less complexity. Many machine learning (ML) algorithms proved their efficiency to detect intrusion in IoT networks. But this ML algorithm suffers many misclassification problems due to inappropriate and irrelevant feature size. In this paper, an in-depth study is presented to address such issues. We have presented lightweight low-cost feature selection IoT intrusion detection techniques with low complexity and high accuracy due to their low computational time. A novel feature selection technique was proposed with the integration of rank-based chi-square, Pearson correlation, and score correlation to extract relevant features out of all available features from the dataset. Then, feature entropy estimation was applied to validate the relationship among all extracted features to identify malicious traffic in IoT networks. Finally, an extreme gradient ensemble boosting approach was used to classify the features in relevant attack types. The simulation is performed on three datasets, i.e., NSL-KDD, USNW-NB15, and CCIDS2017, and results are presented on different test sets. It was observed that on the NSL-KDD dataset, accuracy was approx. 97.48%. Similarly, the accuracy of USNW-NB15 and CCIDS2017 was approx. 99.96% and 99.93%, respectively. Along with that, state-of-the-art comparison is also presented with existing techniques.

Birhanu, A. M., Teferra, T. F., & Lema, T. B. (2021). Fermentation Dynamics of Ethiopian Traditional Beer (Tella) as Influenced by Substitution of Gesho (Rhamnus prinoides) with Moringa stenopetala: An Innovation for Nutrition. *International Journal of Food Science*, 2021. Scopus. https://doi.org/10.1155/2021/7083638

#### Abstract

This study was designed to improve Ethiopian traditional beer (tella) with the substitution of gesho by moringa leaves to enhance micronutrients. Substitution of gesho by moringa from 50 to 100% against the biochemical dynamics and nutritional and sensorial profiles of tella was assessed. Incorporation of moringa suppressed the activity of yeast and favored those of lactic acid bacteria, which shifted the properties of the product from a mild alcoholic nature to a low alcoholic and mild acidic nature, revealing the probiotic potential of tella. Moringa leaves at 100% substitution for gesho resulted in the least yeast count compared to the other formulations. The storage of tella samples over periods of 10 days also strengthened the probiotic nature of tella by drastically reducing the yeast cell counts (from 5 logs to <1). This corresponded to the slow increase in the acidity (0.63 to 0.99%), indicating comparatively higher activity of lactic acid bacteria. The best nutritional contents (dietary minerals) and sensorial acceptance of the product were attained at the 50% substitution of gesho by moringa. The implication of the present study is that ethnic foods and beverages can be innovated to meet the nutritional needs of the community.

### Asfaw, D., & Gashaw, Z. (2021). Field Assignment, Field Choice and Preference Matching of Ethiopian High School Students. *Annals of Data Science*, 8(2), 185–204. Scopus. https://doi.org/10.1007/s40745-018-0182-z

#### Abstract

We examined the determinants of the admittance of students into their top wished-fields of study by university students using data from Ethiopian National Educational Assessment and Examination Agency. It is based on a 2016 cohort of 41,371 applicants in Social Science and 92,135 applicants in Natural Science, who were admitted to public universities in Ethiopia. We use a binary logistic regression model applied to four broadly defined fields in Social Science streaming and found that students' place of residence, gender, EHEECE admission grade and age of the student have a significant positive impact on the decision process towards admitting students into their top wished-fields. Results also showed that there were significant positive interaction effects of EHEECE admission grade, gender and wished-fields on the decision process. We noticed a fair selection between girls and boys into the field of Law and Theatrical Fine Art and Music. For girls the odds of being admitted into the field of Other Social Science and Humanities were relatively better than the odds of being admitted into Business and Economics. We use a polytomous logit regression model applied to seven broadly defined fields in Natural Science streaming and found no selection bias in admitting applicants into the field of first and second ordered preferences among girls and boys, whilst there were a variation among the fields ranked thereafter.

Branesh Robert, J., Angeline Prabhavathy, R., Joanna, P. S., Christopher Ezhil Singh, S., Murugan, S., Rajkumar, S., & Sharma, S. (2021). Flexural Behaviour of RC Beams with a Circular Opening at the Flexural Zone and Shear Zone Strengthened Using Steel Plates. *Advances in Civil Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/6733402

#### Abstract

In this paper, an investigation on the behaviour of RC beams with circular openings in the flexural zone and shear zone strengthened using steel plates is presented. Totally seven beams were cast: a control beam, one beam with a circular opening of size of one-third the depth of the beam (100 mm $\phi$ ) in the flexural zone, one beam with opening strengthened using the steel plate, one beam with a circular opening of size of 100 mm $\phi$  in the shear zone, one beam with an opening in the shear zone strengthened using the steel plate, one beam with two circular openings of size of 100 mm $\phi$  in the shear zone, and another beam with two openings in the shear zone strengthened using the steel plate. The experiments were conducted in a loading frame of 400 kN capacity. The beams were subjected to two-point loading. The ultimate load carrying capacity reduced marginally by 1.78% and 2.8% compared to that of the control beam when a circular opening of 100 mm $\phi$  was provided in the flexural zone and shear zone, respectively, and when the opening was strengthened with steel plates, it reduced by 3.04% and 25%, respectively, but the ductility increased when steel plates were provided. Beams with an opening of size of one-third the depth of the beam (100 mm $\phi$ ) in the flexural zone strengthened with the steel plate can be provided, as the load carrying capacity

is only marginally reduced compared to the control beam, and the ductility is more when compared with beams with unstrengthened openings.

Yalew, A., Tekle Silasie, W., Anato, A., & Fikrie, A. (2021). Food aversion during pregnancy and its association with nutritional status of pregnant women in Boricha Woreda, Sidama Regional State, Southern Ethiopia, 2019. A community based mixed crossectional study design. *Reproductive Health*, 18(1). Scopus. https://doi.org/10.1186/s12978-021-01258-w

#### Abstract

#### Background

Despite high prevalence, food aversions are closely linked to the dietary intake of pregnant women. Thus, understanding this behavior is important in addressing the issue of maternal nutrition. Therefore, the aim of this study is to provide information on the prevalence and associated factors of food aversion and its relationship with the nutritional status of pregnant women in Boricha Woreda, Sidama Regional state, Southern Ethiopia, 2019.

#### Methods

A community based mixed cross sectional study was conducted among 505 randomly selected pregnant mothers at Boricha Woreda, Southern Ethiopia from June 1–20, 2019. Pre-tested and structured face-to-face interview questionnaire and focus group discussion guide were used to collect quantitative and qualitative data respectively. The quantitative data were cleaned, coded and entered into Epi Info version 7.1.4.0 and then exported to SPSS IBM version 20 for further analysis. The qualitative data were analyzed manually using a content analysis. The bi-variable and multivariable logistic regression was used to identify the possible factors of food aversion. AOR with the respective 95% CIs was used to declare statistical significance.

#### Results

Nearly, seven-in-ten (69.2%) of the pregnant women were averted of at least one food. Cereal (45.9%) and enset (44.2%) were averted by majority of the participants. The mean ( $\pm$  SD) MUAC measurement was 22.7 ( $\pm$  2.4) cm. Pregnant women of age group of 24–28 [AOR = 3.04, 95% CI (1.72–5.35)] and 29–33 years [AOR = 2.00, 95% CI (1.02–3.92)], nausea during [AOR = 1.77, 95% CI (1.16–2.70)] and having additional meal [AOR = 1.68, 95% CI (1.02–2.75)] were significantly associated with food aversion. Maternal nutritional status and food aversion was sstatistically significant (p-value < 0.001).

#### Conclusion

High prevalence of food aversions (69.2%) and under nutrition (34.6%) among pregnant women is found. Therefore, the Woreda Health Office needs to intensify the integration of maternal nutrition into ANC services and training of health providers as well as critical appraisal of health extension workers should also be considered.

### Geleta, C. D., & Kannan, N. (2021). Forecasting reference evapotranspiration under climate change scenario in Lake Finchaa Watershed, Ethiopia. *International Journal of Agricultural Technology*, *17*(3), 827–846. Scopus.

#### Abstract

Forecasting the influences of climate change on hydro-climatic and agro-meteorological variables are continued and picked up extensively within the field of hydrology, climatology and agricultural water sciences. Reference Evapotranspiration (ETo) is an important agro-meteorological parameter for irrigation planning and management and highly susceptible to climate perturbation. The effects of climate change on the rate of ETo in Lake Finchaa watershed under of RCP4.5 and RCP8.5 (Representative Concentration Pathway) scenarios at the end of 2055 was investigated. The ETo under current climate condition was estimated by FAO-Penman Monteith (FAO-PM) and Hargreaves-Samani (H-S) models and used to establish the relationship between the models through regression analysis for prediction of future ETo. The signal of selected Regional Climate Models in the Coordinated Regional Climate Downscaling Experiment (RCM-CORDEX) was transferred to the observed temperature data using the change factor downscaling method. The ability of climate models in reproducing observation data was statistically evaluated and validated. The analysis result indicated that the rate of annual average ETo would be rising up to 4.42% at the end of 2055 due to the increase in temperature. The obtained result also showed that annual net rainfall deficit will increase by 77.93 mm per year in Lake Finchaa watershed for the same period. These may increase crop water requirement in the watershed and reduce the water retention and infiltration time into soil, which may lead to decline of water table level, that possibly lead to a reduction in the stream flow into Finchaa hydropower reservoir.

#### Kassa, M., Kebede, F., & Haile, W. (2021). Forms and Dynamics of Soil Potassium in Acid Soil in the Wolaita Zone of Southern Ethiopia. *Applied and Environmental Soil Science*, 2021. Scopus. https://doi.org/10.1155/2021/9917316

#### Abstract

Quantity-intensity (Q/I) characteristics are among conventional approaches for studying potassium dynamics and its availability. This was assessed to determine availability in four districts: namely, Sodo Zuria, Damot Gale, Damot Sore, and Boloso Sore, at three different land use systems (ensetcoffee, crop land, and grazing land). Fractionation and dynamics of K sources were studied in soil samples, which were collected from 0-20 cm depth of each land system. The study revealed that water extractable K (H2O-K) concentrations ranged from 0.13 to 0.34 cmolc kg-1 soils at ensetcoffee and grazing land use systems, respectively, and had a mean value of 0.28 cmolc kg-1 soils ammonium acetate extractable (NH4OAC-K) and nitric acid extract (HNO3-K) had a mean value of 0.25 cmolc kg-1 soils. In this study, the means of nonexchangeable- and exchangeable-K concentrations were of 0.11 and 0.14 cmolc kg-1 soils for land use types. Significant correlations were found between soil properties and Q/I parameters and among equilibrium solution parameters and Q/I parameters. There was no significant variation among the mean quantity values of the soils. The soils had higher change in exchangeable-K and potential buffering capacity than the enset-coffee land use soils, and the cop land had the highest values for these parameters. However, the enset-coffee land use soils had higher K-intensity. Therefore, application of site specific soil fertility management practices and research can improve soil K status and Q/I parameters to sustain productivity soils.

### Fessha, Y. T., & Dessalegn, B. (2021). Freedom of religion and minority rights in South Africa. *Religions*, 12(10). Scopus. https://doi.org/10.3390/rel12100901

#### Abstract

The South African Constitution contains an extensive list of rights, several of which are relevant, directly or indirectly, to accommodate the needs of persons that belong to a religious minority group in South Africa. This article examines the extent to which these protections are utilized by individuals and courts and explores the interplay between these various sources of protection that

religious minority groups and their members can rely on. It will examine the courts' case law on freedom of religion to determine whether the courts have relied on one or all of the rights offered by the Constitution when dealing with claims made by persons belonging to a religious minority group. The reasons for and impacts of the choices that the courts have made will also be investigated. Equally important are the choices made by persons belonging to a religious minority group when approaching courts to vindicate their rights.

# Fekadu, S., Kanehiro, Y., Kartika, A. V., Hamada, K., Sakurai, N., Mizote, T., Akada, J., Yamaoka, Y., Iizasa, H., & Yoshiyama, H. (2021). Gastric epithelial attachment of Helicobacter pylori induces EphA2 and NMHC-IIA receptors for Epstein-Barr virus. *Cancer Science*, *112*(11), 4799–4811. Scopus. https://doi.org/10.1111/cas.15121

#### Abstract

Epstein-Barr virus (EBV)-associated gastric cancer belongs to 1 of the 4 subtypes of gastric cancer and accounts for 10% of total gastric cancers. However, most cases of gastric cancer have a history of Helicobacter pylori infection. Therefore, we investigated the possibility that H. pylori infection promotes the development of EBV-associated gastric cancer. H. pylori was exposed to principal EBV receptor, CD21, negative gastric epithelial cells, and then infected with EBV recombinant expressing enhanced green fluorescent protein. Changes in EBV infectivity due to prior H. pylori exposure were analyzed using flow cytometry. The treatment of gastric epithelial cells with H. pylori increased the efficiency of EBV infection. An increase was also observed when CagAdeficient, VacA-deficient, and FlaA-deficient H. pylori strains were used, but not when cag pathogenicity island-deficient H. pylori was used. The treatment of epithelial cells with H. pylori induced the expression of accessory EBV receptors, EphA2 and NMHC-IIA, and increased the efficiency of EBV infection depending on their expression levels. When gastric epithelial cells were treated with EPHA2 or NMHC-IIA siRNA, EBV infection via H. pylori attachment was decreased. The adhesion of H. pylori induced the expression of accessory EBV receptors in gastric epithelial cells and increased the efficiency of EBV infection.
Menuta, F., & Kifle, Y. (2021). Gender and women representation in Gurage culture of *Ethiopia* (Vol. 48, p. 170). Scopus. https://doi.org/10.1075/impact.48.06men

#### Abstract

The aim of this chapter is to describe the social, cultural and political representation of women in the Gumer district of the Gurage Zone of the snnprs of Ethiopia. We conducted semi-structured interviews and focus group discussions (fgd) with men and women in the district, and analysed the text using critical discourse analysis (cda). We had 19 interviewees and five fgd participants. We also made observation of events in wikjər 'evening gathering' and shopping in the big and small markets where men and women shop categorically, buying different items in different sections of the market. We also consulted documents dealing with gender and women's roles in Gurage. The findings showed that there are noticeable differences between men and women in role categories, social positions, expected behaviours, and in the responses to different gender discourses. The differences were observed in the discourses of blessing, name bestowing, mourning ceremonies and proverbs, in addition to those found during interviews. Different factors, such as financial resources, societal views about men and women, and long-established cultural belief in the society contributed to the lower representation of women in social and political positions.

#### Gebre, G. G., Isoda, H., Amekawa, Y., Rahut, D. B., Nomura, H., & Watanabe, T. (2021a). Gender-based Decision Making in Marketing Channel Choice – Evidence of Maize Supply Chains in Southern Ethiopia. *Human Ecology*, 49(4), 443–451. Scopus. https://doi.org/10.1007/s10745-021-00252-x

#### Abstract

We examine factors affecting the choice of marketing channels for maize among male, female, and joint decision-making farm households using data from households in Dawuro zone, southern Ethiopia. Econometric results suggest that female and joint decision-makers are more likely to sell maize to consumers or retailers in the main local market where the maize price is higher than to wholesale merchants directly from the farm. Individual decision-makers (male or female) who grow improved maize varieties are more likely to sell to wholesalers directly from the farm. This may be an indication of the effectiveness of joint decisions over individual decisions related to the market price. We also found that improved maize varieties distributed to farmers in the study area are of poor quality and that there is a lack of modern storage facilities so that farmers have to sell immediately after harvest during the lower price season. Thus, there is a need for policies promoting the distribution of high-quality maize seeds and encouraging investments in the establishment of modern maize storage facilities in the study area.

### Kaske, D., Yacob, K., & Sakato, T. (2021). Gender-Based Violence Case Management Service. *Violence and Gender*, 8(2), 117–124. Scopus. https://doi.org/10.1089/vio.2020.0070

#### Abstract

Gender-based violence (GBV) against women and girls is one of the most prevalent human rights violations being practiced across different countries, including Ethiopia. The main objective of the study is to assess the GBV case management service and associated factors on female survivors at the Association for Women Sanctuary and Development, Ethiopia. The mixed research approach that includes both quantitative and qualitative was employed with an institutional-based crosssectional survey design. A total of 110 survivors were included in the study from two safehouses. A structured questionnaire was used as a survey instrument and interview guide employed for qualitative data collection. The factors associated with GBV were identified for analysis and categorized into individual, relationship, community, and societal level factors. A binary logistic regression and thematic analysis were used for quantitative and qualitative data, respectively. Findings indicate that survivors were brought to a safehouse due to sexual, physical, and psychological or verbal abuse. Most of the violence was committed by an intimate partner, relatives, and strangers. About 35.5% of survivors were not getting appropriate gender-based case management services. There is a need for urgent attention of those stakeholders who are engaged in the provision of case management services to improve their services regarding the four principles of GBV case management services, namely right to safety, confidentiality, respect, and dignity, plus the right to the best possible assistance without discrimination.

Wondimu, Z., Dong, H., Paterson, A. H., Worku, W., & Bantte, K. (2021). Genetic diversity, population structure, and selection signature in Ethiopian sorghum [Sorghum bicolor L. (Moench)] germplasm. *G3: Genes, Genomes, Genetics, 11*(6). Scopus. https://doi.org/10.1093/g3journal/jkab087

#### Abstract

Ethiopia, the probable center of origin and diversity for sorghum [Sorghum bicolor L. (Moench)] and with unique ecogeographic features, possesses a large number of sorghum landraces that have not been well studied. Increased knowledge of this diverse germplasm through large-scale genomic characterization may contribute for understanding of evolutionary biology, and adequate use of these valuable resources from the center of origin. In this study, we characterized genetic diversity, population structure and selection signature in 304 sorghum accessions collected from diverse sorghum growing regions of Ethiopia using genotyping-by-sequencing. We identified a total of 108,107 high-quality single-nucleotide polymorphism (SNPs) markers that were evenly distributed across the sorghum genome. The average gene diversity among accessions was high (He  $\frac{1}{4}$  0.29). We detected a relatively low frequency of rare alleles (26%), highlighting the potential of this germplasm for subsequent allele mining studies through genome-wide association studies. Although we found no evidence of genetic differentiation among administrative regions (FST ¼ 0.02, P ¼ 0.12), population structure and cluster analyses showed clear differentiation among six Ethiopian sorghum populations (FST ¼ 0.28, P ¼ 0.01) adapting to different environments. Analysis of SNP differentiation between the identified genetic groups revealed a total of 40 genomic regions carrying signatures of selection. These regions harbored candidate genes potentially involved in a variety of biological processes, including abiotic stress tolerance, pathogen defense and reproduction. Overall, a high level of untapped diversity for sorghum improvement remains available in Ethiopia, with patterns of diversity consistent with divergent selection on a range of adaptive characteristics.

Mohammed, A., Faustinelli, P. C., Chala, A., Dejene, M., Fininsa, C., Ayalew, A., Ojiewo, C. O., Hoisington, D. A., Sobolev, V. S., Martínez-Castillo, J., & Arias, R. S. (2021). Genetic fingerprinting and aflatoxin production of Aspergillus section Flavi associated with groundnut in eastern Ethiopia. *BMC Microbiology*, 21(1). Scopus. https://doi.org/10.1186/s12866-021-02290-3

#### Abstract

#### Background

Aspergillus species cause aflatoxin contamination in groundnut kernels, being a health threat in agricultural products and leading to commodity rejection by domestic and international markets. Presence of Aspergillus flavus and A. parasiticus colonizing groundnut in eastern Ethiopia, as well as presence of aflatoxins have been reported, though in this region, no genetic studies have been done of these species in relation to their aflatoxin production.

#### Results

In this study, 145 Aspergillus isolates obtained from groundnut kernels in eastern Ethiopia were genetically fingerprinted using 23 Insertion/Deletion (InDel) markers within the aflatoxinbiosynthesis gene cluster (ABC), identifying 133 ABC genotypes. Eighty-four isolates were analyzed by Ultra-Performance Liquid Chromatography (UPLC) for in vitro aflatoxin production. Analysis of genetic distances based on the approximately 85 kb-ABC by Neighbor Joining (NJ), 3D-Principal Coordinate Analysis (3D-PCoA), and Structure software, clustered the isolates into three main groups as a gradient in their aflatoxin production. Group I, contained 98% A. flavus, including L- and non-producers of sclerotia (NPS), producers of B1 and B2 aflatoxins, and most of them collected from the lowland-dry Babile area. Group II was a genetic admixture population of A. flavus (NPS) and A. flavus S morphotype, both low producers of aflatoxins. Group III was primarily represented by A. parasiticus and A. flavus S morphotype isolates both producers of B1, B2 and G1, G2 aflatoxins, and originated from the regions of Darolabu and Gursum. The highest in vitro producer of aflatoxin B1 was A. flavus NPS N1436 (77.98 µg/mL), and the highest producer of aflatoxin G1 was A. parasiticus N1348 (50.33 µg/mL), these isolates were from Gursum and Darolabu, respectively.

#### Conclusions

To the best of our knowledge, this is the first study that combined the use of InDel fingerprinting of the ABC and corresponding aflatoxin production capability to describe the genetic diversity of

Aspergillus isolates from groundnut in eastern Ethiopia. Three InDel markers, AFLC04, AFLC08 and AFLC19, accounted for the main assignment of individuals to the three Groups; their loci corresponded to aflC (pksA), hypC, and aflW (moxY) genes, respectively. Despite InDels within the ABC being often associated to loss of aflatoxin production, the vast InDel polymorphism observed in the Aspergillus isolates did not completely impaired their aflatoxin production in vitro.

Yu, X., Megens, H.-J., Mengistu, S. B., Bastiaansen, J. W. M., Mulder, H. A., Benzie, J. A. H., Groenen, M. A. M., & Komen, H. (2021). Genome-wide association analysis of adaptation to oxygen stress in Nile tilapia (Oreochromis niloticus). *BMC Genomics*, 22(1). Scopus. https://doi.org/10.1186/s12864-021-07486-5

#### Abstract

#### Background

Tilapia is one of the most abundant species in aquaculture. Hypoxia is known to depress growth rate, but the genetic mechanism by which this occurs is unknown. In this study, two groups consisting of 3140 fish that were raised in either aerated (normoxia) or non-aerated pond (nocturnal hypoxia). During grow out, fish were sampled five times to determine individual body weight (BW) gains. We applied a genome-wide association study to identify SNPs and genes associated with the hypoxic and normoxic environments in the 16th generation of a Genetically Improved Farmed Tilapia population.

#### Results

In the hypoxic environment, 36 SNPs associated with at least one of the five body weight measurements (BW1 till BW5), of which six, located between 19.48 Mb and 21.04 Mb on Linkage group (LG) 8, were significant for body weight in the early growth stage (BW1 to BW2). Further significant associations were found for BW in the later growth stage (BW3 to BW5), located on LG1 and LG8. Analysis of genes within the candidate genomic region suggested that MAPK and VEGF signalling were significantly involved in the later growth stage under the hypoxic environment. Well-known hypoxia-regulated genes such as igf1rb, rora, efna3 and aurk were also associated with growth in the later stage in the hypoxic environment. Conversely, 13 linkage groups containing 29 unique significant and suggestive SNPs were found across the whole growth period under the normoxic environment. A meta-analysis showed that 33 SNPs were significantly

associated with BW across the two environments, indicating a shared effect independent of hypoxic or normoxic environment. Functional pathways were involved in nervous system development and organ growth in the early stage, and oocyte maturation in the later stage.

#### Conclusions

There are clear genotype-growth associations in both normoxic and hypoxic environments, although genome architecture involved changed over the growing period, indicating a transition in metabolism along the way. The involvement of pathways important in hypoxia especially at the later growth stage indicates a genotype-by-environment interaction, in which MAPK and VEGF signalling are important components.

Bates, A. E., Primack, R. B., Biggar, B. S., Bird, T. J., Clinton, M. E., Command, R. J., Richards, C., Shellard, M., Geraldi, N. R., Vergara, V., Acevedo-Charry, O., Colón-Piñeiro, Z., Ocampo, D., Ocampo-Peñuela, N., Sánchez-Clavijo, L. M., Adamescu, C. M., Cheval, S., Racoviceanu, T., Adams, M. D., ... Duarte, C. M. (2021). Global COVID-19 lockdown highlights humans as both threats and custodians of the environment. *Biological Conservation*, 263. Scopus. https://doi.org/10.1016/j.biocon.2021.109175

#### Abstract

The global lockdown to mitigate COVID-19 pandemic health risks has altered human interactions with nature. Here, we report immediate impacts of changes in human activities on wildlife and environmental threats during the early lockdown months of 2020, based on 877 qualitative reports and 332 quantitative assessments from 89 different studies. Hundreds of reports of unusual species observations from around the world suggest that animals quickly responded to the reductions in human presence. However, negative effects of lockdown on conservation also emerged, as confinement resulted in some park officials being unable to perform conservation, restoration and enforcement tasks, resulting in local increases in illegal activities such as hunting. Overall, there is a complex mixture of positive and negative effects of the pandemic lockdown on nature, all of which have the potential to lead to cascading responses which in turn impact wildlife and nature conservation. While the net effect of the lockdown will need to be assessed over years as data becomes available and persistent effects emerge, immediate responses were detected across the world. Thus, initial qualitative and quantitative data arising from this serendipitous global quasi-experimental perturbation highlights the dual role that humans play in threatening and protecting

species and ecosystems. Pathways to favorably tilt this delicate balance include reducing impacts and increasing conservation effectiveness.

Paulson, K. R., Kamath, A. M., Alam, T., Bienhoff, K., Abady, G. G., Abbas, J., Abbasi-Kangevari, M., Abbastabar, H., Abd-Allah, F., Abd-Elsalam, S. M., Abdoli, A., Abedi, A., Abolhassani, H., Abreu, L. G., Abu-Gharbieh, E., Abu-Rmeileh, N. M. E., Abushouk, A. I., Adamu, A. L., Adebayo, O. M., ... Kassebaum, N. J. (2021). Global, regional, and national progress towards Sustainable Development Goal 3.2 for neonatal and child health: All-cause and cause-specific mortality findings from the Global Burden of Disease Study 2019. *The Lancet*, 398(10303), 870–905. Scopus. https://doi.org/10.1016/S0140-6736(21)01207-1

#### Abstract

#### Background

Sustainable Development Goal 3.2 has targeted elimination of preventable child mortality, reduction of neonatal death to less than 12 per 1000 livebirths, and reduction of death of children younger than 5 years to less than 25 per 1000 livebirths, for each country by 2030. To understand current rates, recent trends, and potential trajectories of child mortality for the next decade, we present the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2019 findings for all-cause mortality and cause-specific mortality in children younger than 5 years of age, with multiple scenarios for child mortality in 2030 that include the consideration of potential effects of COVID-19, and a novel framework for quantifying optimal child survival.

#### Methods

We completed all-cause mortality and cause-specific mortality analyses from 204 countries and territories for detailed age groups separately, with aggregated mortality probabilities per 1000 livebirths computed for neonatal mortality rate (NMR) and under-5 mortality rate (U5MR). Scenarios for 2030 represent different potential trajectories, notably including potential effects of the COVID-19 pandemic and the potential impact of improvements preferentially targeting neonatal survival. Optimal child survival metrics were developed by age, sex, and cause of death across all GBD location-years. The first metric is a global optimum and is based on the lowest observed mortality, and the second is a survival potential frontier that is based on stochastic frontier analysis of observed mortality and Healthcare Access and Quality Index.

#### **Findings**

Global U5MR decreased from 71.2 deaths per 1000 livebirths (95% uncertainty interval [UI]  $68 \cdot 3 - 74 \cdot 0$  in 2000 to  $37 \cdot 1$  ( $33 \cdot 2 - 41 \cdot 7$ ) in 2019 while global NMR correspondingly declined more slowly from 28.0 deaths per 1000 live births (26.8-29.5) in 2000 to 17.9 (16.3-19.8) in 2019. In 2019, 136 (67%) of 204 countries had a U5MR at or below the SDG 3.2 threshold and 133 (65%) had an NMR at or below the SDG 3.2 threshold, and the reference scenario suggests that by 2030, 154 (75%) of all countries could meet the U5MR targets, and 139 (68%) could meet the NMR targets. Deaths of children younger than 5 years totalled 9.65 million (95% UI 9.05–10.30) in 2000 and 5.05 million (4.27-6.02) in 2019, with the neonatal fraction of these deaths increasing from 39% (3.76 million [95% UI 3.53–4.02]) in 2000 to 48% (2.42 million; 2.06–2.86) in 2019. NMR and U5MR were generally higher in males than in females, although there was no statistically significant difference at the global level. Neonatal disorders remained the leading cause of death in children younger than 5 years in 2019, followed by lower respiratory infections, diarrhoeal diseases, congenital birth defects, and malaria. The global optimum analysis suggests NMR could be reduced to as low as 0.80 (95% UI 0.71-0.86) deaths per 1000 livebirths and U5MR to 1.44 (95% UI 1.27-1.58) deaths per 1000 livebirths, and in 2019, there were as many as 1.87 million (95% UI 1.35–2.58; 37% [95% UI 32–43]) of 5.05 million more deaths of children younger than 5 years than the survival potential frontier.

#### Interpretation

Global child mortality declined by almost half between 2000 and 2019, but progress remains slower in neonates and 65 (32%) of 204 countries, mostly in sub-Saharan Africa and south Asia, are not on track to meet either SDG 3.2 target by 2030. Focused improvements in perinatal and newborn care, continued and expanded delivery of essential interventions such as vaccination and infection prevention, an enhanced focus on equity, continued focus on poverty reduction and education, and investment in strengthening health systems across the development spectrum have the potential to substantially improve U5MR. Given the widespread effects of COVID-19, considerable effort will be required to maintain and accelerate progress. Funding: Bill & Melinda Gates Foundation.

Nigatu, Z. M., Fan, D., & You, W. (2021). GRACE products and land surface models for estimating the changes in key water storage components in the Nile River Basin. *Advances in Space Research*, 67(6), 1896–1913. Scopus. https://doi.org/10.1016/j.asr.2020.12.042

#### Abstract

The Nile River Basin (NRB) is facing extreme demand for its water resources due to an alarming increase in population and the changing climate. The NRB is not compatible with ground-based in-situ observations owing to its large basin area size and limited hydrological data access from basin countries. Thus, it lends itself to remotely sensed approaches with high spatial resolution and extended temporal coverage. The Gravity Recovery and Climate Experiment (GRACE) avails a unique opportunity to investigate the changes in key components of terrestrial water storage (TWS). GRACE TWS solutions have specific tuning parameters and processing strategies that result in regionally specific variations and error patterns. We explored the TWS time series spatiotemporal changes, trends, uncertainties, and signal-to-noise ratio among different GRACE TWS data. We had also investigated the key terrestrial water storage components such as surface water, soil moisture, and groundwater storage changes. The results show that GRACE spherical harmonic solutions' uncertainty is higher than the mass concentration (mascon) over the NRB, and the Center for Space Research-mascons had the best performance. The evapotranspiration correlation (R2 = 0.85) has the highest correlation with GRACE' TWS, whereas the normalized difference vegetation index (R2 = 0.82) has the second highest correlation. Notably, significant long-term (2003-2017) negative groundwater and soil moisture trends demonstrate a potential depletion of the NRB. Despite an increase in precipitation and the TWS time series, the rate of decline increased rapidly after 2008, thereby indicating the possibility of human-induced change (e.g. for irrigation purposes). Therefore, the results of this study provide a guide for future studies related to hydro-climatic change over the NRB and similar basins.

Nigussie, A., Haile, W., Agegnehu, G., & Kiflu, A. (2021a). Grain Yield and Nitrogen Uptake of Maize (Zea mays L.) as Affected by Soil Management Practices and Their Interaction on Cambisols and Chernozem. *International Journal of Agronomy*, 2021. Scopus. https://doi.org/10.1155/2021/3411456

#### Abstract

Although numerous factors contribute to wide yield gaps, low external inputs, particularly N, and poor cropping practices such as soil tillage and monocropping are among the major factors affecting low maize production. In view of this, field experiments were implemented on two sites with Cambisols and Chernozem soil types in two consecutive years to evaluate the impacts of different soil management practices on the grain yield and quality, nitrogen uptake, and selected soil properties. A three-factor experiment was arranged as a split-split plot arrangement randomized complete block design with three replications. The minimum tillage (MT) and conventional tillage (CT) were used as the main plot, haricot bean-maize rotation and maize monocropping were used as the subplot, and four levels of nitrogen fertilization (control, 20 t ha-1 compost, 46 kg N ha-1 + 10 t ha-1 compost, and 92 kg N ha-1) were used as the sub-subplot. Analysis of variance showed that soil management practices were significantly affecting grain yield, N-uptake, and soil properties. In sites, the conventional tillage and rotation system increased the grain yield and N-uptake in contrast to the minimum tillage and monocropping, respectively. Similarly, nitrogen evidently affected the grain yield, N-uptake, and selected soil properties. However, tillage methods differed in their effects on soil chemical properties; soil organic carbon and total nitrogen concentrations were improved through MT compared to CT. Grain yield was signicantly associated with NDVI, grain N-content, and N-uptake. Therefore, a CT plus haricot bean-maize rotation system with the addition of solely 92 kg N ha-1 and integrated 46 kg N ha-1 + 10 t compost ha-1 could be recommended for Hawassa Zuria (Cambisols) and Meskan (Chernozem) districts, respectively. However, in order to ensure sustainable maize production in the investigated areas, an integrated N treatment with MT and a rotation system may be recommended, which could improve soil properties.

Noulèkoun, F., Birhane, E., Kassa, H., Berhe, A., Gebremichael, Z. M., Adem, N. M., Syoum, Y., Mengistu, T., Lemma, B., Hagazi, N., Abrha, H., Rannestad, M. M., & Mensah, S. (2021). Grazing exclosures increase soil organic carbon stock at a rate greater than "4 per 1000" per year across agricultural landscapes in Northern Ethiopia. *Science of the Total Environment*, 782. Scopus. https://doi.org/10.1016/j.scitotenv.2021.146821

#### Abstract

The establishment of grazing exclosures is widely practiced to restore degraded agricultural lands and forests. Here, we evaluated the potential of grazing exclosures to contribute to the "4 per 1000" initiative by analyzing the changes in soil organic carbon (SOC) stocks and sequestration (SCS) rates after their establishment on degraded communal grazing lands in Tigray region of Ethiopia. We selected grazing areas that were excluded from grazing for 5 to 24 years across the three agroecological zones of the region and used adjacent open grazing lands (OGLs) as control. Soil samples were collected from two depths (0–15 cm and 15–30 cm) and SOC and aboveground C stocks were quantified in both exclosures and OGLs. The mean SOC stock and SCS rate in exclosures (0-30 cm) were 31 Mg C ha-1 and 3 Mg C ha-1 year-1, which were respectively 166% and 12% higher than that in the OGLs, indicating a positive restoration effect of exclosures on SOC storage. With increasing exclosure age, SOC stock and SCS rate increased in the exclosures but decreased in the OGLs. Higher SOC stock and SCS rate were recorded in 0–15 cm than in 15-30 cm. The relative (i.e., to the SOC stock in OGLs) rates of increase in SOC stocks (70–189‰ year–1) were higher than the 4‰ year–1 and were initially high due to low initial SOC stock but declined over time after a maximum value of SOC stock is reached. Factors such as aboveground biomass, altitude, clay content and precipitation promoted SOC storage in exclosures. Our study highlights the high potential of exclosures for restoring SOC in the 0-30 cm soil depth at a rate greater than the 4‰ value. We argue that practices such as grazing exclosure can be promoted to achieve the climate change mitigation target of the "4%" initiative.

## Tesfaye, M., Tesfaye, G., & Getahun, A. (2021). Growth and status of Nile tilapia (Oreochromis niloticus L.) stock in Lake Chamo, Ethiopia. *Lakes and Reservoirs: Research and Management*, 26(3). Scopus. https://doi.org/10.1111/lre.12375

#### Abstract

Global inland freshwater fisheries support livelihoods for several million people. These important resources, however, are suffering from excessive overfishing as a result of increasing fishing pressures attributable to an increased human population and subsequent demand for food and economic livelihoods. To this end, very little is known about the vital population parameters and stock status of Nile tilapia (Oreochromis niloticus) in Lake Chamo in Ethiopia. Thus, the present study focused on determining the Nile tilapia population parameters and assessing their stock status in Lake Chamo, using length-frequency and catch-effort data collected between February 2018 and January 2019 from commercial fish catches from 10 major fish landing sites. The TropFishR software package was used to determine von Bertalanffy growth parameters, and length-converted catch curve and empirical models were used to calculate mortality parameters. The maximum sustainable yield (MSY) and its corresponding level of effort (f MSY) were determined using the length-based Thompson & amp; Bell yield prediction model. The growth parameters L  $\infty$ , K and  $\Phi'$  of the Nile tilapia stock were found to be 59.4-cm, 0.41/year and 3.16, respectively. The annual rate of total (Z), natural (M) and fishing mortality (F) were estimated to be 2.442, 0.558 and 1.884/year, respectively. The calculated current yield (711 t/year) is lower than the predicted values of MSY (771 t/year). The present level of fishing effort (2564 nets/day) is more than twice higher than the optimum level of fishing effort (1026 nets/day), clearly indicating overfishing of the Nile tilapia stock in the lake. This finding is also substantiated by the high level of exploitation rate (E = 0.771). Thus, a recommendation based on the results of the present study is a 60% reduction in the fishing effort (1538 nets/day), which will also provide a higher fish yield. The results of the present study also are useful facilitate development of appropriate management strategies for the Nile tilapia fishery in Lake Chamo.

Nigussie, A., Haile, W., Agegnehu, G., & Kiflu, A. (2021b). Growth, Nitrogen Uptake of Maize (Zea mays L.) and Soil Chemical Properties, and Responses to Compost and Nitrogen Rates and Their Mixture on Different Textured Soils: Pot Experiment. *Applied and Environmental Soil Science*, 2021. Scopus. https://doi.org/10.1155/2021/9931763

#### Abstract

Integrated nutrient management, which primarily involves the combined application of organic and inorganic nutrient sources, is one of the simplest approaches to handle declining soil fertility challenges and increase crop productivity and production. Keeping in view this fact, a pot experiment was conducted to evaluate the effects of compost and inorganic nitrogen fertilizer and their mixture on soil properties, growth, and nitrogen uptake of maize on loam and clay textured soils at the Awada Agricultural Research Subcenter. Treatments comprised factorial combinations of five compost rates  $(0, 5, 10, 15, \text{ and } 20 \text{ t} \cdot \text{ha-1})$  and four rates of inorganic nitrogen fertilizer  $(0, 5, 10, 15, \text{ and } 20 \text{ t} \cdot \text{ha-1})$ 46, 92, and 138 kg·N·ha-1) laid out as a completely randomized design with three replications. Results showed that both the main and interaction effects of compost and mineral N fertilizer rates significantly affected the selected soil chemical properties and yield, and nitrogen concentration of maize. There were significant associations between plant parameters and soil nitrogen contents. The addition of 92 kg·ha-1·N + 10 t·ha-1 compost and 46 kg·ha-1·N + 10 t·ha-1 compost was the best treatments for loam and clay textured soils of the study areas, which improved shoot dry matter by 179.5 and 284.5%, compared to the unfertilized pot, respectively. From the results of this experiment, we concluded that the integrated application of compost and mineral nitrogen fertilizer enhanced soil chemical properties and thus improved nitrogen uptake and sustainable production of maize in the study areas.

Mahela, O. P., Khan, B., Alhelou, H. H., Tanwar, S., & Padmanaban, S. (2021). Harmonic mitigation and power quality improvement in utility grid with solar energy penetration using distribution static compensator. *IET Power Electronics*, 14(5), 912–922. Scopus. https://doi.org/10.1049/pel2.12074

#### Abstract

Distribution static compensator is based on power electronic devices technology which is utilized to supply rapid changes in active power as well as reactive power of utility grids. This is useful to achieve corrections in power factor, balancing of load, compensation of current and filtering of harmonics. Therefore, proposed work investigates the improvement of the power quality by utilizing the distribution static compensator, which is equipped by battery energy storage system and interfaced to distribution network with solar photo voltaic (PV) energy integration. In the present study, distribution static compensator is controlled using a control strategy based on the synchronous reference frame theory. Customised IEEE-13 nodes test system incorporating solar PV generation and distribution static compensator, is utilized to perform the harmonic mitigation and power quality analysis. Disturbances of power quality and harmonics have been investigated due to abrupt changes in the insolation of solar radiation, outage of PV plant from grid and synchronization of PV plant to grid. MATLAB/Simulink environment is utilized to perform the study. Effectiveness of a developed approach is validated by comparing results of simulation with results extracted in real time using real time digital simulator. Results indicate that the developed method is more effective for harmonic mitigation and improving power quality of electrical power in distribution network integrated with solar PV generation. Performance of the approach is compared with the performance of methods reported in the literature to establish the suitability of the method for harmonics mitigation and power quality improvement in grid with solar energy.

Mebrate, B., & Mohammed, A. (2021). Harnack inequality and an asymptotic mean-value property for the Finsler infinity-Laplacian. *Advances in Calculus of Variations*, 14(3), 365–382. Scopus. https://doi.org/10.1515/acv-2018-0083

#### Abstract

In this paper, we prove a Harnack inequality for nonnegative viscosity supersolutions of nonhomogeneous equations associated with normalized Finsler infinity-Laplace operators. Viscosity solutions to homogeneous equations are also characterized via an asymptotic mean-value property, understood in a viscosity sense.

Belay, S., Giday, M., & Manyazewal, T. (2021). Harnessing Clinical Trial Capacity to Mitigate Zoonotic Diseases: The Role of Expert Scientists in Ethiopia. *Frontiers in Public Health*, 9. Scopus. https://doi.org/10.3389/fpubh.2021.621433

#### Abstract

#### Background

The emergence and resurgence of zoonotic diseases have continued to be a major threat to global health and the economy. Developing countries are particularly vulnerable due to agricultural expansions and domestication of animals with humans. Scientifically sound clinical trials are important to find better ways to prevent, diagnose, and treat zoonotic diseases, while there is a lack of evidence to inform the clinical trials' capacity and practice in countries highly affected with the diseases. This study aimed to investigate expert scientists' perceptions and experiences in conducting clinical trials toward zoonotic diseases in Ethiopia.

#### Methods

This study employed a descriptive, qualitative study design. It included major academic and research institutions in Ethiopia that had active engagements in veterinary and public health researches. It included the National Veterinary Institute, the National Animal Health Diagnostic and Investigation Center, the College of Veterinary Medicine at Addis Ababa University, the Ethiopian Public Health Institute, the Armauer Hansen Research Institute, and the College of Health Sciences at Addis Ababa University. In-depth interviews were conducted with expert

scientists. Data were collected from October 2019 to April 2020. Data analysis was undertaken using open code 4.03 for qualitative data analysis.

#### Results

Five major themes, with 18 sub-themes, emerged from the in-depth interviews. These were: challenges in the prevention, control, and treatment of zoonotic diseases; One Health approach to mitigate zoonotic diseases; personal and institutional experiences in conducting clinical trials on zoonotic diseases; barriers in conducting clinical trials toward zoonotic diseases; and strategies that promote conducting clinical trials on zoonotic diseases. Conducting clinical trials on zoonotic diseases in Ethiopia is hampered by a lack of clearly articulated ethics and regulatory frameworks, trial experts, financial resources, and good governance.

#### Conclusion

In Ethiopia, conducting clinical trials on zoonotic diseases deserves due attention. Strengthening institutional and human resources capacity is a pre-condition to harness effective implementation of clinical trials on zoonotic diseases in the country. In Ethiopia where skilled human resource is scarce, One Health approach has the potential to form multidisciplinary teams to systematically improve clinical trials capacity and outcomes in the country.

Wolde, S., Mirkena, T., Melesse, A., Dessie, T., & Abegaz, S. (2021b). Hatchability and growth performances of normal feathered local, Sasso-RIR and their F1-cross chickens managed under on-station condition in southern Ethiopia. *Tropical Animal Health and Production*, 53(5). Scopus. https://doi.org/10.1007/s11250-021-02957-z

#### Abstract

The Normal feathered local chicken (LL), Sasso-RIR (SRSR) and their F1-cross (LSR) chickens were hatched to evaluate for egg hatchability, body weight, feed efficiency, and survival rate. After 14 days of brooding, 150 chicks of each genotype were randomly selected and further replicated into five pens in a deep litter grower house consisting of 30 chicks each in a completely randomized design, and evaluated for a period of 16 weeks. Hatchability of fertile eggs was highest for LL (80.0%), intermediate for LSR (68.6%), and lowest for SRSR (55.9%) chickens. The body weight (BW) of chicks at 2 weeks of age was 80.0, 76.3, and 61.5 g/bird for SRSR, LSR, and LL, respectively, the latter being the lowest (p < 0.05). The respective BW at 8 weeks of age was 732,

587, and 451 g while at 18 weeks it was 1877, 1379, and 1070 g/bird and different from each other (p < 0.05). During 3- to 8-week and 9- to 18-week growth periods, the LL chickens were inferior (p < 0.05) in feed intake (29.7 and 66.9 g/d/bird) whereas the SRSR chickens were superior (p < 0.05) in body weight gain (15.5 and 16.3 g/d/bird) and feed conversion ratio (2.67 and 5.35 g feed/g gain), respectively. The mortality rate of chicken was not affected by genotypes. It can be concluded that Sasso-RIR chicken genotype had played a significant role in upgrading the growth rate and market weight of the local normal feathered chicken without adverse effect on hatchability, feed efficiency, and survival rate.

Tenaw, Z., Siyoum, M., Tsegaye, B., Werba, T. B., & Bitew, Z. W. (2021). Health Professionals Job Satisfaction and Associated Factors in Ethiopia: A Systematic Review and Meta-analysis. *Health Services Research and Managerial Epidemiology*, 8. Scopus. https://doi.org/10.1177/2333928211046484

#### Abstract

#### Background

Health professionals' job satisfaction is crucial for health professionals' life which determines health care service quality. This study aimed to estimate pooled prevalence of job satisfaction of health professionals and associated factors in Ethiopia.

#### Methods

Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) was followed to prepare this study. Studies were searched from PubMed (EBSCOhost), Directory of open access journals (DOAJ), Global health, African Index Medicus, IRIS (WHO digital publication), African Journals Online (AJOL), Google Scholar, and Google. Random-effect model was used to estimate the pooled prevalence of job satisfaction and associated factors. Heterogeneity was assessed using I2 test statistics. Publication bias was checked using funnel plot, Egger's regression test, and sensitivity analysis.

#### Results

The pooled prevalence of health professionals' job satisfaction was computed from 35 studies, and it was 46.68% (95%, confidence interval (CI): 41.82, 51.54, I2 = 95.8%). Specifically, job satisfaction was 57.56%, 48.80%, 48.57%, 48.48%, 44.56%, 39.20%, and 16.5% among pharmacy

professionals, health officers, midwives, nurses, anesthetists, physicians, and health extension workers, respectively. Secured working environment (pooled odds ratio [POR] = 6.50, 95% CI: 3.41-9.58), coworkers relationship (POR = 5.14, 95% CI: 1.27, 9.02), good relationship with supervisors (POR = 5.86, 95% CI: 2.56-9.16) and having bachelor's degree (POR = 2.52, 95% CI: 1.31, 3.72) were significantly associated with job satisfaction.

#### Conclusion

Job satisfaction among Ethiopian health professionals is considerably low. Secured working environment, positive relationships among staff, and having a bachelor's enhanced the job satisfaction. Designing strategies to improve safety in the work environment and improved communication among workers could improve job satisfaction.

Gebere, Y. F., Bimerew, L. G., Malko, W. A., & Fenta, D. A. (2021). Hematological and CD4+ T- cell count reference interval for pregnant women attending antenatal care at Hawassa University Comprehensive Specialized Hospital, Hawassa Southern Ethiopia. *PLoS ONE*, *16*(4 April). Scopus. https://doi.org/10.1371/journal.pone.0249185

#### Abstract

#### Background

Pregnancy is a state characterized by physiological, hematological, and immunological changes. However, the reference intervals (RI) being used in clinical practice in Ethiopia are derived from non-local general populations. Therefore; this study was aimed to determine the reference interval of hematological and immunological profiles among healthy pregnant mothers attending Hawassa University Hospital.

#### Methods

A cross-sectional study in a total of 360 healthy pregnant women was enrolled from January to April 2019, at Hawassa University hospital. Sociodemographic and obstetric data were collected using a structured questionnaire. Blood samples collected from each participant were used to define the hematological parameters. The median and 95% intervals were calculated for the immunological and hematological profiles. P-value 0.05 was considered statistically significant.

#### Result

A total of 360 healthy pregnant women were enrolled in this study. The age range of the participants was 18–45 years. 342(95%) were married and 270 (75%) of the participants were

multigravida. The overall median CD4+ T-cell and total WBC counts (cells/mm3) were 602 and 7.58 respectively. The overall median value for lymphocytes, neutrophils, monocytes, eosinophils, and basophil count was (cells/mm3) was 2.21, 6.74, .63, .53, and 0.09 respectively. Whereas the median RBC and platelet count was  $4.48 \times 106/\mu$ Land  $212 \times 106/\mu$ L. The median value of hematological profiles in the first, second, and third trimesters was TWBC (103/ $\mu$ L) (7.90, 8.30, 8.65), RBC (106/ $\mu$ L) (4.5, 4.6, 4.62), and PLT (103/ $\mu$ L) (210, 209,161) respectively. The CD4 T cell count median value was (600, 598, and 591) in the first, second, and third trimesters. Significant changes were observed in hematological and immunological parameters between trimesters (P < 0.05).

#### Conclusion

Significant changes were observed in hematological and immunological parameters between trimesters (P < 0.05). Considerable differences were also seen between the values in this study and other studies from Ethiopia and other countries, indicated the need for the development of local reference intervals for pregnant women.

Mengistu, S. B., Palstra, A. P., Mulder, H. A., Benzie, J. A. H., Trinh, T. Q., Roozeboom, C., & Komen, H. (2021). Heritable variation in swimming performance in Nile tilapia (Oreochromis niloticus) and negative genetic correlations with growth and harvest weight. *Scientific Reports*, *11*(1). Scopus. https://doi.org/10.1038/s41598-021-90418-w

#### Abstract

Nile tilapia is predominantly produced in smallholder ponds without aeration. We hypothesize that Nile tilapia with high oxygen uptake efficiency (O2UE) may perform better under these conditions than Nile tilapia with low O2UE. Critical swimming speed (Ucrit, in cm s–1) is a potential indicator for O2UE. Our objectives were to estimate variance components for Ucrit and fish size at swim testing early in life, and genetic correlations (rg) between Ucrit with harvest weight (HW) and daily growth coefficient (DGC) later after grow-out in a non-aerated pond. Substantial heritability was found for absolute Ucrit (0.48). The estimated rg between absolute Ucrit and fish size at testing were all strong and positive (range 0.72-0.83). The estimated rg between absolute Ucrit and fish size with HW, and absolute Ucrit and DGC were – 0.21 and – 0.63 respectively, indicating that fish with higher absolute Ucrit had lower growth in the non-aerated pond as compared to fish with

lower absolute Ucrit. These results suggest a juvenile trade-off between swimming and growth performance where fish with high Ucrit early in life show slower growth later under conditions of limited oxygen availability. We conclude that Ucrit in Nile tilapia is heritable and can be used to predict growth performance

Hamada, Y., Getahun, H., Tadesse, B. T., & Ford, N. (2021). HIV-associated tuberculosis. *International Journal of STD and AIDS*, 32(9), 780–790. Scopus. https://doi.org/10.1177/0956462421992257

#### Abstract

Tuberculosis (TB) remains a leading cause of morbidity and mortality among people living with HIV. HIV-associated TB disproportionally affects African countries, particularly vulnerable groups at risk for both TB and HIV. Currently available TB diagnostics perform poorly in people living with HIV; however, new diagnostics such as Xpert Ultra and lateral flow urine lipoarabinomannan assays can greatly facilitate diagnosis of TB in people living with HIV. TB preventive treatment has been underutilized despite its proven benefits independent of antiretroviral therapy (ART). Shorter regimens using rifapentine can support increased availability and scale-up. Mortality is high in people with HIV-associated TB, and timely initiation of ART is critical. Programs should provide decentralized and integrated TB and HIV care in settings with high burden of both diseases to improve access to services that diagnose TB and HIV as early as possible. The new prevention and diagnosis tools recently recommended by WHO offer an immense opportunity to advance our fight against HIV-associated TB. They should be made widely available and scaled up rapidly supported by adequate funding with robust monitoring of the uptake to advance global TB elimination.

Hailu, D., Tadele, H., Tadesse, B. T., Alemayehu, A., Abuka, T., Woldegebriel, F., Gedefaw, A., Mengesha, S., & Haji, Y. (2021). Home delivery practice and its predictors in South Ethiopia. *PLoS ONE*, *16*(8 August). Scopus. https://doi.org/10.1371/journal.pone.0254696

#### Abstract

#### Background

Institutional delivery is one of the key interventions to reduce maternal death. It ensures safe birth, reduces both actual and potential complications, and decreases maternal and newborn death. However, a significant proportion of deliveries in developing countries like Ethiopia are home deliveries and are not attended by skilled birth attendants. We investigated the prevalence and determinants of home delivery in three districts in Sidama administration, Southern Ethiopia.

#### Methods

Between 15–29 October 2018, a cross sectional survey of 507 women who gave birth within the past 12 months was conducted using multi-stage sampling. Sociodemographic and childbirth related data were collected using structured, interviewer administered tools. Uni-variate and backward stepwise multivariate logistic regression models were run to assess independent predictors of home delivery.

#### Results

The response rate was 97.6% (495). In the past year, 22.8% (113), 95% confidence interval (CI) (19%, 27%) gave birth at home. Rural residence, adjusted odds ratio (aOR) = 13.68 (95%CI:4.29–43.68); no maternal education, aOR = 20.73(95%CI:6.56–65.54) or completed only elementary school, aOR = 7.62(95% CI: 2.58–22.51); unknown expected date of delivery, aOR = 1.81(95% CI: 1.03–3.18); being employed women (those working for wage and self-employed), aOR = 2.79 (95%CI:1.41–5.52) and not planning place of delivery, aOR = 26.27, (95%CI: 2.59–266.89) were independently associated with place of delivery.

#### Conclusion

The prevalence of institutional delivery in the study area has improved from the 2016 Ethiopian Demography Health Survey report of 26%. Uneducated, rural and employed women were more likely to deliver at home. Strategies should be designed to expand access to and utilization of institutional delivery services among the risky groups.

Kaliappan, S., Saravanakumar, R., Karthick, A., Kumar, P. M., Venkatesh, V., Mohanavel, V., & Rajkumar, S. (2021). Hourly and Day Ahead Power Prediction of Building Integrated Semitransparent Photovoltaic System. *International Journal of Photoenergy*, *2021*. Scopus. https://doi.org/10.1155/2021/7894849

#### Abstract

The building integrated semitransparent photovoltaic (BISTPV) system is an emerging technology which replaces the conventional building material envelopes and roof. The performance prediction of the BISTPV system places a vital role in the reduction of the energy consumption in the building. In this work, the artificial neural network (ANN) is used to predict the performance of this system by optimizing the important parameter of the feature selection. The Elman neural network (EN) algorithm, feed forward neural network (FN), and generalized regression neural network model (GRN) are investigated in this study. The performance metrics of the errors are analysed such as the root mean square error (RMSE), mean absolute percentage error (MAPE), and mean square root (MSE). According to the findings, the model behaves consistently at the specified time and place in the experiment. Forecasters utilizing neural network models will have better accuracy if they use techniques like EN, FFN, and GRN having the RMSE of 0.25, 0.37, and 0.45, respectively.

## Hernandez-Ramirez, G., Ruser, R., & Kim, D.-G. (2021). How does soil compaction alter nitrous oxide fluxes? A meta-analysis. *Soil and Tillage Research*, 211. Scopus. https://doi.org/10.1016/j.still.2021.105036

#### Abstract

Nitrous oxide (N2O) is a potent greenhouse gas and precursor of ozone layer depletion. Managed terrestrial ecosystems are major anthropogenic sources of N2O, primarily generated in the soil. The physical makeup of the soil interplays with the underlying biochemistry that produces N2O. Therefore, it has been conceptualized that either compacting or loosening the soil will alter N2O emissions; however, a unified framework of these relationships is yet to be established. Here, we compiled, reviewed and analyzed available field studies that have evaluated how applied compaction or alleviation of compacted soils impacts N2O emissions. Of the 108 available

pairwise comparisons, 82 % of the cases showed detrimental increases in N2O emissions caused by increased compaction. Overall, N2O emissions nearly doubled because of soil compaction effects (P < 0.05). This doubling of N2O emissions was linked to a relative reduction of 9 % in soil porosity (i.e., 0.05 cm3 cm-3) caused by applied compaction. This linkage to soil porosity was clearly evident in both croplands and pastures. Across the managed terrestrial ecosystems evaluated, the strongest relative effects of compaction on N2O emissions were found in forest and pasture soils. Overall, N2O emissions in forest soils showed a fivefold increase caused by compaction (P < 0.05; n = 11). This massive response in forest soils can be attributed to: i) their low N2O emission baseline; ii) their acidic pH, which intrinsically favors N2O emissions; iii) having some of the heaviest traffic loads found across our meta-analysis (e.g., 16 Mg); and iv) an increase in soil microporosity. Pasture soils also displayed substantial compaction effects on N2O emissions, with a threefold increase (P & lt; 0.05; n = 25). This was explained in part by the elevated nitrogen input rates in pastures (e.g., 600-1000 kg N ha-1). Conversely, alleviation of soil compaction by implementing controlled traffic farming (CTF) in vegetable and grain croplands reduced N2O emissions consistently in all available pairwise comparisons (P & lt; 0.05; n = 19). At the field scale, CTF greatly decreased N2O emissions by one-third compared with farmlands managed with conventional random traffic (4.48 versus 2.86 kg N2O-N ha-1). However, after reviewing the available literature, we witnessed a paucity of information about how long it takes for soils to self-alleviate from the detrimental effects of compaction on N2O emissions. Additionally, insights gained through meta-analysis revealed the interplay of soil compaction with underlying heavy textures, acidic pH, and reduced porosities, which collectively exacerbate N2O emissions. Nevertheless, these complex interactions operate differentially across contrasting land use options.

### Ketema, A., & Dwarakish, G. S. (2021a). Hydro-meteorological impact assessment of climate change on Tikur Wuha watershed in Ethiopia. *Sustainable Water Resources Management*, 7(4). Scopus. https://doi.org/10.1007/s40899-021-00547-3 Abstract

This study focused on examining the potential effects of climate change on hydro-meteorological variables at the Tikur Wuha watershed (TWW). The weighted average of the validated Coordinated Regional Climate Downscaling Experiment (CORDEX) data of the five Regional Climate Models (RCMs) from multiple General Circulation Models (GCMs) was used to simulate

the potential impacts of climate change on streamflow using Soil and Water Assessment Tools (SWAT) model in TWW. The result revealed that the Bega, Kiremt, and annual rainfall increased in both mid and end century for all scenarios. In contrast, the Belg rainfall decreased for all cases except for RCP8.5 at the end century. The rainfall increased more in the end century than mid-century. The increase in rainfall is higher in the Bega compared to Belg and Kiremt season. No significant change in variability of precipitation is observed in the study area. Both the average minimum and maximum temperature increased for all cases except a slight reduction in the RCP4.5 scenario in mid-century. Climate change affects the streamflow in the study watershed by increasing the wet season flow and reducing the dry season flow.

## Nigatu, Z. M., Fan, D., You, W., & Melesse, A. M. (2021). Hydroclimatic extremes evaluation using GRACE/GRACE-FO and multidecadal climatic variables over the nile river basin. *Remote Sensing*, *13*(4), 1–25. Scopus. https://doi.org/10.3390/rs13040651

#### Abstract

Hydroclimatic extremes such as droughts and floods triggered by human-induced climate change are causing severe damage in the Nile River Basin (NRB). These hydroclimatic extremes are not well studied in a holistic approach in NRB. In this study, the Gravity Recovery and Climate Experiment (GRACE) mission and its Follow on mission (GRACE-FO) derived indices and other standardized hydroclimatic indices are computed for developing monitoring and evaluation methods of flood and drought. We evaluated extreme hydroclimatic conditions by using GRACE/GRACE-FO derived indices such as water storage deficits Index (WSDI); and standardized hydroclimatic indices (i.e., Palmer Drought Severity Index (PDSI) and others). This study showed that during 1950–2019, eight major floods and ten droughts events were identified based on standardized-indices and GRACE/GRACE-FO-derived indices. Standardized-indices mostly underestimated the drought and flood severity level compared to GRACE/GRACE-FO derived indices. Among standardized indices PDSI show highest correlation ( $r^2 = 0.72$ ) with WSDI. GRACE- /GRACE-FO-derived indices can capture all major flood and drought events; hence, it may be an ideal substitute for data-scarce hydro-meteorological sites. Therefore, the proposed framework can serve as a useful tool for flood and drought monitoring and a better understanding of extreme hydroclimatic conditions in NRB and other similar climatic regions.

Chala, G., Eguale, T., Abunna, F., Asrat, D., & Stringer, A. (2021). Identification and Characterization of Campylobacter Species in Livestock, Humans, and Water in Livestock Owning Households of Peri-urban Addis Ababa, Ethiopia: A One Health Approach. *Frontiers in Public Health*, 9. Scopus. https://doi.org/10.3389/fpubh.2021.750551

#### Abstract

Campylobacter is the most common cause of bacterial infectious diarrhea and acute gastroenteritis globally, and is recognized as a significant zoonotic pathogen. Antimicrobial resistance amongst Campylobacter isolates is a significant global concern. A cross-sectional study was conducted to identify and characterize Campylobacter species in humans, animals and water sources in livestock owning households of peri-urban Addis Ababa, Ethiopia; and to characterize antimicrobial resistance. A total of 519 fecal samples from humans (n = 99), livestock (n = 179), poultry (n = 179), poul 69), and water (n = 172) were collected. Samples were cultured for viable Campylobacter spp. and multiplex PCR utilized for the identification and confirmation. Antimicrobial susceptibility of the isolates was assessed using the Kirby-Bauer disc diffusion method. Campylobacter spp. was detected in 67/519 (13.0%) of the total tested samples, and the household level prevalence of Campylobacter was 42.4%. The prevalence of Campylobacter spp. was: humans (10.1%), cattle (18.5%), poultry (13.0%), sheep (13.3%), goats (7.1%), and water (10.5%). Campylobacter jejuni and C. fetus were the most frequently isolated species, followed by C. coli. The majority of isolates obtained from human samples had co-occurrence with isolates from cattle, poultry or water samples from the same household. The use of stored water, the practice of indoor and outdoor manure collecting, and animal species Campylobacter positivity were significantly associated with greater odds of human Campylobacter spp. positivity. All Campylobacter isolates from humans, poultry, sheep, goats and water, and 96.0% of isolates from cattle were resistant to at least one or more of the tested antimicrobials, with 95.5% of isolates resistant to three or more classes of antimicrobials. A One Health approach is recommended to further investigate Campylobacter species infections, and other zoonotic infectious diseases, in the livestock owning populations in Ethiopia, where there is close interaction between humans, animals and the environment.

Swarnkar, N. K., Mahela, O. P., Khan, B., & Lalwani, M. (2021). Identification of IslandingEvents in Utility Grid with Renewable Energy Penetration Using Current Based PassiveMethod.IEEEAccess,9,93781–93794.Scopus.https://doi.org/10.1109/ACCESS.2021.3092971

#### Abstract

Renewable energy (RE) generation levels are increasing in modern power systems at a fast rate due to their advantages of clean and non-exhaustible nature of energy. However, this type of generation creates technical challenges in terms of operation and control due to uncertain and unpredictable nature of generation. Islanding is an operational scenario where there is a loss of grid and RE generators continue to feed power to the local load. This has harmful effects on the RE generators and operating personal. Hence, it is expected that islanding scenario is identified in minimum time and RE generators are disconnected within 2~s duration after island formation. This paper designed an islanding identification scheme (IDS) by designing a current islanding detection indicator (CIDI) that combines the features computed by processing the current signals, negative sequence current (NSC) and negative sequence voltage (NSV) using the Stockwell transform (ST) and the Hilbert transform (HT). Information contained by the total harmonic distortions of voltage (THD\_v) and current (THD\_i) is also used while designing the CIDI. Islanding and non-islanding events of category-I II are identified and discriminated from each other by comparison of peak magnitude of CIDI with the first threshold value (FTV) and second threshold value (STV). This IDS effectively recognizes the islanding events even in the noisy environment with minimum non-detection zone (NDZ) and minimum time. The efficiency is greater than 98% even with the noise of 20dB SNR (signal to noise ratio). The performance of proposed IDS is better compared to IDS using discrete wavelet transform (DWT), Empirical mode decomposition (EMD), Slantlet transform Ridgelet probabilistic neural network (RPNN), and artificial neural network (ANN). The effectiveness of IDS is validated on IEEE-13 nodes test system using MATLAB software, practical distribution network and in real time scenario by use of real time digital simulator (RTDS).

Getaneh, T., Negesse, A., Dessie, G., Desta, M., Temesgen, H., Getu, T., & Gelaye, K. (2021b). Impact of cesarean section on timely initiation of breastfeeding in Ethiopia: A systematic review and meta-analysis. *International Breastfeeding Journal*, *16*(1), 51. Scopus. https://doi.org/10.1186/s13006-021-00399-9

#### Abstract

#### Background

Timely initiation of breastfeeding is feeding of breast milk within one hour of birth, however, three in five babies were not breastfed in the first hour of birth globally. There is evidence that cesarean section is the major constraint for this low prevalence, but the impact of cesarean section on timely initiation of breastfeeding in Ethiopia is limited. Therefore, this meta-analysis aimed to provide evidence for policy makers, health professionals and program implementers.

#### Methods

This systematic review followed the Preferred Reporting Items for Systematic reviews and Meta-Analysis guidelines. Electronic bibliographic databases such as PubMed/Medline, EMBASE, PsycINFO, CINHAL, Scopus, Google Scholar, Science Direct and Cochrane Library were used to search relevant studies and was conducted up to February 2021. Random effects model metaanalysis was applied to estimate the pooled impact of cesarean section on timely initiation of breastfeeding with 95% confidence intervals (CI). I2 statistical test and, funnel plot and Egger's test were used to check heterogeneity and publication bias across included studies respectively.

#### Results

According to meta-analysis of 17 studies, the pooled estimate of timely initiation of breastfeeding among women who had cesarean section in Ethiopia was 40.1% (95% CI 33.29, 46.92). The meta-analysis of 29,919 study participants showed that cesarean section was associated with a 79% lower odds of timely initiation of breastfeeding compared with vaginal birth (OR 0.21; 95% CI 0.16, 0.28).

#### Conclusions

In Ethiopia, almost only one-third of mothers who gave birth by cesarean section initiate breastfeeding within one hour of birth, much lower than the pooled prevalence among general population. Special health promotion, intervention and healthcare provider support during immediate or early skin to skin contact, and having focused breastfeeding guidelines for postoperative patient and trained health professionals should be considered for mothers who give birth through cesarean section.

Sarathchandra, C., Alemu Abebe, Y., Worthy, F. R., Lakmali Wijerathne, I., Ma, H., Yingfeng, B., Jiayu, G., Chen, H., Yan, Q., Geng, Y., Weragoda, D. S., Li, L.-L., Fengchun, Y., Wickramasinghe, S., & Xu, J. (2021). Impact of land use and land cover changes on carbon storage in rubber dominated tropical Xishuangbanna, South West China. *Ecosystem Health and Sustainability*, 7(1). Scopus. https://doi.org/10.1080/20964129.2021.1915183

#### Abstract

Land use and land cover (LULC) play a significant role in carbon regulation. South-China accounts for ~65% of China's carbon sink. In Xishuangbanna (South-China), rubber is expanding rapidly creating an urgent need to understand and monitor LULC change and how spatial variation affects carbon storage (CS). This is vital for the formation and implementation of better land use management practices. We studied LULC changes of 22-year period; addressing how these changes have affected the CS. We quantified LULC changes between 1988 and 2010 using remote sensing methods and calculated CS changes using InvEST. Results showed that between 1988 and 2010, the rate of deforestation accelerated to 203.2 km2 y–1 and ~23% of forest were lost. Conversion of natural forest to rubber was responsible for 78% of this deforestation. Rubber expansion rate was 153.4 km2 y–1. Changes to LULC drove a temporal CS reduction 0.223 Tg C/km2. Local stakeholders have strong economic interest in converting land to more profitable plantations. Government efforts is required to control land conversion through new policies and incentives to retain natural forest. Assessment of specific potential land use change will be required to avoid promoting the conversion of high carbon storage land uses to low carbon storage land uses.

Jambo, Y., Alemu, A., & Tasew, W. (2021). Impact of small-scale irrigation on household food security: Evidence from Ethiopia. *Agriculture and Food Security*, 10(1). Scopus. https://doi.org/10.1186/s40066-021-00294-w

#### Abstract

#### Background

Adamitulu Jido Komoblcha is one of the districts located in lowland areas of the Oromia region with irrigation potentials of 14,000 hectares out of which only 2568 hectares are under small-scale irrigation practices. Though there are a lot of households using irrigation in the study area, the impact that it has brought on the food security of the household is not yet well studied in the area. Several related studies reviewed lack appropriate impact evaluation methods in studying the impact of small-scale irrigation on food security that may result in overestimation or underestimation of the impact. To this end, the main motivation behind this study was to examine whether small-scale irrigation in the study area is creating positive change on household food security or not using the propensity score matching approach.

#### Methodology

Both primary and secondary data were collected and used in the study. The primary data were collected from randomly selected 94 irrigation users and 100 non-user households from February to March 2018. Secondary data were collected from a review of different works of literature. Both descriptive statistics and econometric models were applied to analyze the data using Stata software version 13. The study applied the propensity score matching (PSM) model to analyze the impact of small-scale irrigation on food security. In analyzing the impact of small scale irrigation on food security, we have used calorie intake, crop harvest and consumption both from own production and bought from the sale of the crop harvest produced through irrigation as an indicator of food security.

#### Results

The study has found that participation in irrigation is positively determined by age, education, land size, access to extension service, and participation in off or non-farm activities. In contrast to this, participation in irrigation is negatively determined by distance from farm plot to water source and distance from the main market. The results of the nearest neighbor and caliper matching estimators show that participation in small-scale irrigation increased the daily calorie intake of the small-scale

irrigation users by 643.76 kcal over non-user households. Similarly, it increased their daily calorie intake to 596.43 kcal and 591.74 kcal, respectively, with radius and kernel matching estimators. The result further indicted that irrigation had positive impact on crop production, consumption and revenue generation which all together indicated improvement in food security. The sensitivity analysis test shows that impact results estimated by this study were insensitive to unobserved selection bias which shows it is a real impact of the irrigation.

#### Conclusion

It was concluded that irrigation has a positive and significant impact on household food security. Concerned bodies that working on small-scale irrigation development therefore should continue investment in irrigation activities for poverty reduction strategies and scale-up irrigation interventions to the other areas where there is potentially irrigable land.

Hurisso, T. T., Davis, J. G., Chala, A., Getachew, A., & Wolde-Meskel, E. (2021). Impacts of Grinding and Acidification of Animal Bones with Coffee Wastewater on Plant Dry Matter Yield and Recovery of Phosphorus. *Communications in Soil Science and Plant Analysis*, 52(10), 1076–1088. Scopus. https://doi.org/10.1080/00103624.2021.1872603

#### Abstract

In sub-Saharan Africa, soil fertility depletion and limited access to mineral phosphorus (P) fertilizers are considered among the main constraints of crop productivity. The goal of our work is to make P fertilizer from locally available materials, thus reducing the costs due to importation and transportation for smallholder-farmers with limited financial capacities. Cattle bones collected from slaughterhouses were ground to two fineness-level, acidified using coffee wastewater (pH ~4.3), and then compared to commercially available diammonium phosphate (DAP) in a pot experiment using Zea mays (maize) and Phaseolus vulgaris (common bean). Finely ground bones increased maize and common bean dry matter yield (DMY) and P uptake compared to coarsely ground bones, but a significant interaction between grinding and acidification also suggests that acidification with coffee wastewater increased availability of bone-based P, at least two-times more DMY and P uptake under acidified finely ground bones than for non-acidified treatments. In addition, acidified finely-ground bones produced maize and common bean DMY, P uptake and P recovery efficiency that were comparable to those of DAP. These results demonstrate the utility

of acidified finely ground bones to enhance crop yields, potentially serving as an alternative P-rich resource to imported and expensive fertilizers that depend on nonrenewable resources.

Tadesse, E., Negash, M., & Asfaw, Z. (2021). Impacts of traditional agroforestry practices, altitudinal gradients and households' wealth status on perennial plants species composition, diversity, and structure in south-central Ethiopia. *Agroforestry Systems*, *95*(8), 1533–1561. Scopus. https://doi.org/10.1007/s10457-021-00659-x

#### Abstract

Conspicuous trees and other perennial plants in smallholders' farms have been acknowledged for their biodiversity conservation values. Impacts of agroforestry practices, elevation gradients, wealth status on perennial plant composition, diversity, and structure were empirically assessed. Four agroforestry practices were considered, namely, dispersed trees in perennial crops, homesteads, boundary plantations, and woodlots. In all, 540 sample plots were randomly selected and surveyed. A total of 138 perennial plant species belongs to 113 genera and 62 families were identified and recorded. Of the species, 79% were trees, 18% shrubs, and 3% non-woody perennials. Also, 83% of identified plant species were native. A substantial proportion of the species (71%) were naturally regenerated. The highest native woody plant species were found in homesteads (75%) and the least in woodlots (15%). Dimensionality in species compositions across agroforestry practices was graphically displayed using none-metric multidimensional scaling and there were significant differences (p < 0.001). Species richness was significantly highest in homesteads (72.3  $\pm$  3.5), while Shannon diversity (2.5  $\pm$  0.2) in boundary plantation (p < 0.001). Middle altitude and rich households had harbored significantly the highest species richness, Shannon diversity index, and Simpson evenness index (p < 0.05). The general linear model showed the primary interactions of determinants had significantly positive effects on biodiversity values (p < 0.001). The study reveals agroforestry interventions should consider agroforestry practices, socioeconomic settings, elevation gradients, and interactions among them in favoring or disfavoring the growing of native perennial plant species on the agricultural landscape in the central highland of Ethiopia and beyond in the tropics.

Fakhar, M. S., Kashif, S. A. R., Liaquat, S., Rasool, A., Padmanaban, S., Iqbal, M. A., Baig, M. A., & Khan, B. (2021). Implementation of APSO and Improved APSO on Non-Cascaded and Cascaded Short Term Hydrothermal Scheduling. *IEEE Access*, *9*, 77784–77797. Scopus. https://doi.org/10.1109/ACCESS.2021.3083528

#### Abstract

Short-term hydrothermal scheduling (STHTS) is a highly non-linear, multi-model, non-convex, and multi-dimensional optimization problem that has been worked upon for about 5 decades. Many research articles have been published in solving different test cases of STHTS problem, while establishing the superiority of one type of optimization algorithm over the type, in finding the near global best solution of these complex problems. This paper presents the implementation of an improved version of a variant of the Particle Swarm Optimization algorithm (PSO), known as Accelerated Particle Swarm Optimization (APSO) on three benchmark test cases of STHTS problems. The adaptive and variable nature of the local and global search coefficients for the proposed APSO significantly improve its performance in obtaining the optimal solution for the STHTS test cases. Two of these cases are non-cascaded cases of STHTS problem (NCSTHTS) and one case is cascaded case of STHTS problem (CSTHTS). The results are compared with the results of the previous implementations of the other algorithms, the parametric and non-parametric statistical tests have been implemented to establish the superiority of results of one type of algorithms.

#### Arunkumar, G., Dhanamjayulu, C., Padmanaban, S., Prusty, B. R., & Khan, B. (2021). Implementation of Optimization-Based PI Controller Tuning for Non-Ideal Differential Boost Inverter. *IEEE Access*, 9, 58677–58688. Scopus. https://doi.org/10.1109/ACCESS.2021.3071538

#### Abstract

The demand for renewable energy to sustain today's vulnerability towards depleting fossil fuels is a crucial agenda for research. Various inverter topologies have been proposed to convert renewable sources into a usable form. But output THD, additional filtering components at line frequency (leading to bulky circuitry), lower efficiency, etc., are some of the limitations faced in all those topologies. This paper aims to change a voltage source inverter's traditional

behavior, which generates lesser output voltage with higher THD. The paper proposes a closedloop non-ideal differential boost inverter (DBI) employing a PI controller. The optimization techniques such as, genetic algorithm (GA) and bacterial foraging optimization algorithm (BFOA) are incorporated to accentuate the PI controller's performance to produce a better response during line and load disturbance conditions with reduced THD. DBI performance is evaluated on a laboratory prototype with different loading conditions. A comparison between the algorithms and the previous topologies from the literature survey has also been provided to validate this research's claims. This paper's required simulation study is carried out using MATLAB, and real-time validation is carried out using dSPACE 1104 with sampling time of one µs.

# Taye, T., Moges, A., Muluneh, A., Lebay, M., & Abiye, W. (2021). Implication of Long-Term Terracing Watershed Development on Soil Macronutrients and Crop Production in Maybar Subwatershed, South Wello Zone, Ethiopia. *Air, Soil and Water Research, 14*. Scopus. https://doi.org/10.1177/11786221211004220

#### Abstract

Long-term watershed management in Ethiopia was evaluated in various agro-ecologies starting in the 1980s. Our research was carried out to investigate the effects of long-term watershed management on soil macronutrient status and crop production in the Maybar subwatershed terrace positioning system, which has a long-term data set on various aspects, such as hydroclimatology, agriculture, and social studies. Crop yield data were collected from 40 fixed plots of that data set, and soil samples were collected by topo-sequencing of the catchment from the cultivation field based on different terrace position plot arrangements. The results showed higher crop yield and production of biomass in the upper section or deposition zone of soil and water conservation structure than below the structure or loss zone, but did not vary significantly from the annual production potential. The annual production of cereals was marginally decreased, but not pulse crops, reducing the wheat harvest production from the middle to the loss zone (23.8%) rather than the deposition zone to middle portion of the terrace (8.0%). In comparison, to increase the slope position of the terrace, the redaction percentage of pulse crops (field pea and lentil) is greater, because in the first terrace location (upper to middle) and in the second terrace, the output capacity of field pea was reduced by 22.4%. The condition of soil fertility between the 2 consecutive systems for soil and water protection differed from the upper to the lower land positions. Improvement in soil chemical and physical properties relatively increased toward the upper land position. Soil organic matter, available phosphorus, bulk density, and soil moisture content were significantly affected by soil and water conservation structures ( $P \le .05$ ). Long-term terrace growth typically has a positive effect on improvements in onsite soil resources and the capacity for crop production. It therefore has a beneficial impact on onsite natural resources, such as enhancing soil macronutrients and increasing productivity in crop yields.

Taye, T., & Moges, A. (2021). Implication of long-term watershed development on landuse/land cover change and sediment loss in Maybar Sub-Watershed, South Wello Zone,Ethiopia.CogentFoodandAgriculture,7(1).Scopus.https://doi.org/10.1080/23311932.2020.1863596

#### Abstract

Long-term-watershed management in Ethiopia has been assessed in different locations since the 1980s, but there are no adequate studies of its effect on the aspects of natural resources. A boundary map of geographical coordination and Google Earth imagery was created from the ground base survey. This study was conducted to investigate the implications of long-term watershed management on the land use/land cover change and trend of runoff-sediment loss. Data for this study were obtained from- Time-series satellite Landsat images of the years 1986, 1997, 2008, and 2019, and runoff, and sediment load and discharge data from the Maybar watershed station dataset. Analyses of these data show, from 1986 to 2019, forest and settlement land area coverage had been increased from 20.9% to 39.2% and from 9.2% to 22.6%, respectively. In contrast, cultivation land, open woodland, and grassland coverage was reduced from 26.7% to 18.4%, from 32.7% to18.9%, and from 10.6% to 1.1%, respectively. The discharge–runoff and runoff–sediment load processes were affected by the watershed development activity which the trend of annual sediment loss and runoff generation slightly reduced through time. Therefore, the long-term growth of watersheds has a beneficial effect on changes in on-site natural resources, such as improving vegetation coverage and reducing the generation of runoff.

Kibret, K. S., Marohn, C., & Cadisch, G. (2021). Improved food-insecurity prediction in smallholder-dominated landscapes using MODIS Enhanced Vegetation Index and Google Earth Engine: A case study in South Central Ethiopia. *European Journal of Remote Sensing*, 54(1), 624–640. Scopus. https://doi.org/10.1080/22797254.2021.1999176

#### Abstract

Recent droughts and food insecurity underline the need for objective, timely, spatially explicit food aid prediction in Ethiopia. We developed a generic user-friendly method to detect greening of agricultural areas and derive predictions of agricultural production for potentially foodinsecure areas. We used the Enhanced Vegetation Index (EVI) from combined Terra/Aqua MODIS (Moderate Resolution Imaging Spectroradiometer) images to generate EVI time series over multiple growing seasons. Maximum seasonal greening (EVImax), as proxy for biomass and expected crop yield, was related to rainfall variability and to indicate areas of risk for crop failure due to drought within the necessary reaction time for emergency aid. Four agroecological zones were covered from 2003 to 2019. Vegetation periods per 250m pixel were calculated back from EVImax. EVImax was validated against measured yields on large-scale farms. Interannual means and variability of EVImax served to assess production and drought risk. Yield predictions corresponded well with wheat production ( $r2 \approx 0.5 \text{ p} \le 0.05$ ). High temporal variability and low absolute EVI indicated drought-prone areas. EVI was positively correlated with rainfall data in cropped drought-prone areas ( $r2 \approx 0.4$ ,  $p \leq 0.05$ ), but negatively in temporally waterlogged highlands (r2 $\cong$ 0.3, p $\le$ 0.05). Our user-friendly approach on Google Earth Engine can accurately detect imminent food insecurity and facilitate timely interventions.

# Kumar, S. D., Sankar, L. P., Sathish, T., Vijayan, V., Parthiban, A., Kamalakannan, R., & Rajkumar, S. (2021). Improving the mechanical properties of natural fiber composites of hemp fiber with ramie and banana fiber through compression molding method. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/7813634

#### Abstract

Natural fiber composite is the most preferable research area in the modern situation due to its availability, applications, and ecofriendly quality. This paper deals with the influence of hemp fiber with the various compositions of the ramie fiber and some basic mechanical properties of

banana fiber composites. The hemp fiber is maintained as 20 percentage of total volume. Then, the remaining volume percentage is shared with the ramie fiber and banana fiber with various combinations. Eleven specimens were prepared to identify the some basic mechanical properties. The chemical compositions were mentioned as a pie chart, and then experimental results were plotted as graphical representations like line diagram and radar diagram for clear identification that the composite with higher ramie fiber concentration provided the greater results in the mechanical behaviors. The suitable composite combinations were recommended based on their superior properties as conclusions.

# Andualem, D., Gelgele, M., & Bayssa, M. (2021). In vitro gas production kinetics of selected multipurpose tree browses in Gelana rangelands. *Livestock Research for Rural Development*, 33(2). Scopus. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85106381450&partnerID=40&md5=a9e6f3ea05c97669c5ef0bc4233678f4

#### Abstract

This study was conducted in Gelana Rangelands, Southern Ethiopia to evaluate potential yield, chemical composition and in-vitro gas production potential of selected indigenous multipurpose browse trees. Eight browse species were selected based on their relative palatability, preference by ruminant, multiple function and availability in the dry season. The leaves of selected browse species were collected during wet and dry seasons for the determination of chemical composition and in vitro gas production test. A significant difference (P<0.05) in leaf biomass yield was observed between browse species where the value ranged from 0.77 to 3.3 (kg/tree). The average Dry Matter (DM) yield was higher (P < 0.05) in the wet than the dry season. Crude protein (CP) content was higher (P < 0.05) in the wet season except for R. albersii which had a higher value in the dry season. Both the value of Neutral Detergent Fiber (NDF) and Acid Detergent Fiber (ADF) were highest (P < 0.05) in F. thonningii while the lowest values for both NDF and ADF were recorded in R. albersii. The condensed tannin (CT) value ranged from 0.2 to 11.13% (DM) in V. amygalina and D. angustifolia, respectively in the wet season while the CT values of browse trees ranged from 0.45% to 9.95% DM in the same species in the dry season, respectively. The total gas production at 24 hr incubation ranged from 13-50 ml/200 mg DM, gas production at 48 hr incubation 24-55.5 ml/200 mg DM in the wet season, and 21-51to 30-65 ml/200 mg DM in the dry season, respectively. Organic Matter Digestibility (OMD) ranged from 56.72-90.23 %,
Metabolizable Energy (ME) 4.25-9.15 MJ/kg DM, and Short Chain Fatty Acid(SCFA) 0.25-1.13 mmol/L in wet season while 54.78-95.63 %, 5.13-9.27 MJ/kg DM and 0.44-1.16 mmol/L in dry season, respectively. R. albersii, V. amygalina and C. africana leaves were best in terms of gas volume, OMD, ME and SCFA production potential characteristics. Therefore, the three tree species had the best nutritive value and could be considered as potential sources of animal feed supplement during the dry season when regular feed resources are limited in quality and quantity.

# Bekele, E. K., Tyler, R. T., Henry, C. J., House, J. D., & Nosworthy, M. G. (2021). In vitro protein digestibility of direct-expanded chickpea–sorghum snacks. *Legume Science*, *3*(4). Scopus. https://doi.org/10.1002/leg3.87

# Abstract

Blending cereals with pulses provides a balanced protein with higher biological value as their amino acid compositions are complementary. Extrusion not only can improve protein digestibility but also may reduce essential amino acid content. This study investigated the effects of extrusion parameters and blend ratio on in vitro protein digestibility (IVPD) and IVPD-corrected amino acid score (IVPDCAAS) of direct-expanded chickpea-sorghum snacks. Chickpea-sorghum blends (50:50, 60:40, and 70:30 chickpea:sorghum, w/w) were extruded at 10 combinations of moisture content (16%, 18%, and 20%) and barrel temperature (120°C, 140°C, and 160°C), and at 169°C and 15% moisture, the conditions identified in a previous study as producing maximal expansion. Chickpea and sorghum flours were extruded at 140°C and 18% moisture for comparison purposes. The IVPD of raw 50:50, 60:40, and 70:30 chickpea–sorghum blends ranged from 76% to 78%; values for raw chickpea and sorghum flours were 79% and 74%, respectively. Extrusion increased IVPD (P < 0.05) of all flours and blends. An increase in extrusion temperature increased the IVPD of extrudates (P < 0.05), whereas an increase in moisture content had the opposite effect (P < 0.05). The IVPDCAAS of raw 50:50, 60:40, and 70:30 chickpea-sorghum blends were 0.64, 0.72, and 0.73, respectively; values for raw chickpea and sorghum flours were 0.74 and 0.27, respectively. Extrusion increased IVPDCAAS (P < 0.05). The 70:30 chickpea-sorghum blend extruded at the maximal expansion exhibited the highest protein quality indicating this to be the optimal condition for snack production.

Assele, D. D., Lendado, T. A., Awato, M. A., Workie, S. B., & Faltamo, W. F. (2021). Incidence and predictors of mortality among patients with head injury admitted to Hawassa University Comprehensive Specialized Hospital, Southern Ethiopia: A retrospective followup study. *PLoS ONE*, *16*(8 August). Scopus. https://doi.org/10.1371/journal.pone.0254245

# Abstract

#### Introduction

Head injury is the leading cause of morbidity and mortality throughout the world, especially in resource-limited countries including Ethiopia. However, little is known about the mortality rate and its predictors among these patients in Ethiopia. Thus, the study aims to assess the incidence rate of mortality and its predictors among patients with head injury admitted at Hawassa University Comprehensive Specialized Hospital.

#### Methods

Institutional based retrospective follow-up study was conducted among 1220 randomly selected head injury patients admitted from July 2017 to July 2019. Bivariable and multivariable Cox regression models were fitted to identify the predictors of mortality. Proportionality assumption was tested by a global test based on the Schoenfeld residuals test.

#### **Results**

The incidence of the mortality rate was 2.26 (95%CI: 1.9-2.6) per 100-person day observation. The independent predictors of time to death were age above 65 years (AHR:3.49, 95% CI:1.63, 7.48), severe TBI (AHR: 8.8, 95%CI:5.13, 15.0), moderate TBI (AHR:3, 95% CI:1.73,5.31), hypotension (AHR:1.72, 95%CI: 1.11,2.66), hypoxia (AHR:1.92, 95%CI: 1.33,2.76), hyperthermia (AHR:1.8, 95%CI: 1.23,2.63) and hypoglycemic (AHR:1.94, 95% CI: 1.34, 2.81) positively associated with mortality, while underwent neurosurgery was negatively associated with mortality (AHR: 0.25, 95% CI: 0.11,0.53).

## Conclusion

The incidence of mortality rate among head injury patients was high. Older age, moderate and severe TBI, hypotension and hypoxia at admission, neurosurgical procedure, and the episode of hyperthermia and hypoglycemia during hospitalization were the independent predictors of mortality among head injury patients. Therefore, intervention to reduce earlier deaths should focus on the prevention of secondary brain insults.

Hordofa, D., Abunna, F., Megersa, B., & Abebe, R. (2021). Incidence of morbidity and mortality in calves from birth to six months of age and associated risk factors on dairy farms in Hawassa city, southern Ethiopia. *Heliyon*, 7(12). Scopus. https://doi.org/10.1016/j.heliyon.2021.e08546

#### Abstract

Calf morbidity and mortality are major causes of economic losses on dairy farms worldwide, with a far greater impact in developing countries such as Ethiopia. A prospective longitudinal study on dairy farms in the city of Hawassa was conducted between August 2018 and July 2019, to estimate the cumulative incidence of calf morbidity and mortality and to identify the associated risk factors. For this purpose, 221 calves from 20 farms were examined every 15 days from birth to the age of six months. We used the Kaplan Meier (K-M) method, log rank test, and Cox proportional hazards regression to analyze the data. Of the calves examined, 48.4% (n = 107) had various clinically visible health problems, while 19.5% (n = 43) died from various causes. Using the K-M method, the cumulative incidence of all-cause morbidity at the end of the sixth month of life was 50.12% (95% CI: 43.58%–57.05%), while the cumulative incidence of all-cause mortality was 20.04% (95% CI: 12.56%–26.06%). The most commonly diagnosed disease syndrome was diarrhea (64.5%), followed by pneumonia (15%), septicemia (6.5%), joint disease (4.7%), conjunctivitis (3.7%), umbilical infections (2, 8%) and other unknown causes (11.2%). Diarrhea was also the leading cause of death (46.5%). The other causes of calf mortality were pneumonia (16.3%), septicemia (7%), and unknown diseases (30.2%). In the K-M hazard analysis, the greatest risk of calf morbidity and mortality was observed during the first month of life and then the risk decreased significantly as the calves grew. Of the 21 potential risk factors studied, the multivariable Cox proportional hazards regression model showed that time calves ingested their first colostrum, calving difficulty, and calving season were the three predictors that were significantly associated with a higher risk of morbidity and mortality. A higher risk of morbidity was observed in calves that had ingested their first colostrum six hours after birth (HR = 1.9; P = 0.003), had calving difficulties (HR = 2.96; P < 0.001) and were born in the rainy season (HR = 1.64; P = 0.017) compared to calves that had consumed colostrum immediately after birth, had no difficulties at birth and were born in the dry season. The same three factors have been identified to influence calf mortality. The mortality risk was 2.73 (P = 0.002), 4.62 (P < 0.001) and 2.74 (P = 0.002) times

higher in calves that had difficulty calving, ingested their first colostrum meal six hours after birth and were born in the rainy season, respectively. In general, the calf morbidity and mortality rates identified in this study were beyond economically justifiable limits and calls for educating farmers to raise awareness of some easy-to-fix issues such as colostrum feeding.

Worojie, T. B., Asfaw, B. T., & Mengesha, W. A. (2021b). Indigenous biosystematics of yams (Dioscorea spp.) in Southwest Ethiopia: Folk taxonomy, ethnolinguistic analysis, and folk descriptors. *Journal of Ethnobiology and Ethnomedicine*, 17(1). Scopus. https://doi.org/10.1186/s13002-020-00427-8

### Abstract

Background: In Southwest Ethiopia, various plant species are coexisting in wild and cultivated forms. This provides an ideal setting for studying folk biosystematics of neglected species. One of such species is the Dioscorea species, in which we studied to assess the commonly applied folk wisdom of identifying, naming, and classifying yams by Sheko and Bench farmers. Methods: This study was conducted in Bench-Maji and Sheka Zones using 272 farmers. Data on the lists of local names and system of folk taxonomy; the inherent logic, etymons, and consistency of names; and the folk descriptors and other criteria involved in taxonomy were collected. Data were collected by establishing participatory research appraisal tools, i.e., informant interviews and researcher direct observation. Results: The result suggests that there exists a well-developed folk taxonomic system in Sheko and Bench. This is evident in the recognition of four distinct folk ranks: subvariety, variety, supra-variety, and folk generic. Taxa assigned to each ranks have distinct features that mark them as members of a separate categories. Farmers over-differentiate 58 individual taxa at the intraspecific levels. Of these, 37 represented varietal taxa while the rest are sub-varietal taxa. Structurally, over 78% of the varieties are labeled with unitary names while all the sub-varieties consisted of binomial names. Farmers used a total of 26 characters and 74 character states for identifying the different taxa. More than 84% of these refer to aspects of plant characteristics. Tuber characters played a key role in the local identification of varietal and sub-varietal taxa while contexts and gender played a key role in the recognition of supra-variety groups. Conclusions: This study documented a great wealth of knowledge on indigenous biosystematics of yams, constitutes an essential step towards setting development priorities aimed at in situ conservation.

The study clearly demonstrated the value of folk biosystematics for assessing the actual extent and spatial dynamics of yam diversity in traditional farming.

# Cochrane, L., & Thornton, A. (2021). Individual and Institutional Drivers of Inequality in Rural Agricultural Contexts: Evidence from Southern Ethiopia. *Northeast African Studies*, 21(1), 19–44. Scopus.

# Abstract

Ethiopia has experienced high rates of macroeconomic growth and reports a significant decline of people living in poverty. At the same time, inequality is increasing. In order to understand what is driving inequality, in particular in rural agricultural contexts, we use a mixed-methods approach rooted in knowledge coproduction. The results identify penultimate causes for reasons why individuals accumulate or lose assets and resources, as has been identified in other literature. A focus on the individual and penultimate causes, however, makes invisible the structures and systems that contribute to those occurrences. We find that individual drivers of divergence (e.g., illness, debt, death) exist within systems and structures that marginalize some while providing opportunity for others. So-called "development" activities are part of these drivers, often negatively affecting the already marginalized and vulnerable. The findings suggest that individual-and community-level interventions will only enable a certain degree of change, unless and until the structural and systemic components of inequality and marginalization are transformed.

# Yuvarani, P., Vijayachitra, S., Ranganayaki, V., Sathish Kumar, S., Srujan Raju, K., Sivachitra, M., & Komalnu Raghavan, I. (2021). Industrial Waste Water Recycling Using Nanographene Oxide Filters. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/4528949

#### Abstract

Nanomaterials play a vital role in healthcare, electronics, manufacturing industries, biotechnology, and security systems. One such material is graphene and its oxides are specifically used for recycling industrial waste water. Graphene, a single layer in honeycomb cross section, provides excellent attention because of its significant optical, mechanical, and physical properties. GO was utilized to decrease the acidic or essential centralization of the mechanical wastewater into reusable

water for the modern reason utilizing graphene channels. In this paper, sample solution (waste water) is taken from paper industry. Graphene channels can be created from the pencil graphite. Graphene has the high goals of separating capacity, and graphene is considered as "a definitive RO film" in light of its stronger, thinner, and more chemically safe nature than the polymer layers. Graphene oxide layers are likewise to be used in the desalination plant in place of the RO membrane.

Nijjar, S., Sudhakara, P., Sharma, S., Saini, S., Teklemariam, A., Mariselvam, V., Sampath, S. K., & Song, J. I. (2021). Influence of Alkali Treatment and Maleated Polypropylene (MAPP) Compatibilizer on the Dry-Sliding Wear and Frictional Behavior of Borassus Fruit Fine Fiber (BFF)/Polypropylene (PP) Polymer Composites for Various Engineering Applications. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/5822245

### Abstract

Tribological properties of the novel Borassus fruit fine fiber- (BFF-) reinforced polypropylene (PP) composites with respect to fiber matrix surface modifications have been described. Composites were fabricated by an injection molding process using Borassus fruit fine fiber (BFF) of 5 wt.% as reinforcement and polypropylene (PP) as a matrix component. Fibers were treated with alkali (T) to remove the residual lignin (if present) and to enhance the interfacial adhesion between the fiber/matrix interface. Alkali treatment reveals additional reactive functional groups here on the surface of the Borassus fiber, allowing effective interaction bonding with the polypropylene matrix. Borassus fibers are primarily treated with an alkali solution to extract weaker unstructured amorphous constituents so that the fibers retain crystallized components, thereby strengthening the fiber's strength. A 5 wt.% of maleated polypropylene (MAPP) was used as a compatibilizer to improve the interfacial adhesion between fiber and the polymer matrix. The wear and frictional behavior of BFF/PP composites with respect to the modifications were evaluated by steel counterface utilizing pin-on-disc test contraption under dry-sliding conditions. The sliding velocity, applied load, and sliding distance were maintained as 2.198 m/s, 9.81-29.43 N, and 4000 m, respectively. The results demonstrate that the reinforcement of BFF to polypropylene matrix and the modifications improved the wear properties of the neat polymer matrix. Findings concluded that the abrasive wear resistance of T + PP + MAPP composite showed

better interfacial adhesion and bonding, thus resulting in better tribological performance as compared to the other three compositions under different loading conditions. The effective substantial improvement of the coefficient of friction has been observed in alkali-treated fiber and polypropylene matrix with MAPP compatibilizer (T + PP + MAPP) composites due to the presence of MAPP compatibilizer and alkali-treated fibers. The frictional coefficient of T + PP + MAPP possesses better interfacial bonding strength upon NaOH treatment, and coupling agent, which results in enhancement of effective contact surface area and good surface friction characteristics, has been observed under different loading conditions. The fracture mechanism of worn-out portions of BFF/PP composites was studied using high-resolution scanning electron microscopy to analyze various imperfections like debonding, splits, fiber cracks, and wreckage or fragments formation.

Sankar, C., Gangatharan, K., Christopher Ezhil Singh, S., & Sivaraj, M. (2021). Influence of AZ91 alloy reinforced with nano B4C particles on microstructural characterization, hardness and tribological properties prepared through powder metallurgy. *Materials Research Express*, 8(10). Scopus. https://doi.org/10.1088/2053-1591/ac2ce5

#### Abstract

In this present work, a milled B4C nanoparticle was reinforced into the AZ91 alloy with different weight percentages (5, 10, 15, and 20%) by powder metallurgy. XRD and SEM for the crystalline behavior and morphology of the AZ91-xB4C composite. The wear resistance on the load and Sliding Distance (SD) of the specimen has been experimented with the pin-on-disc apparatus and Vickers hardness machine to measure hardness. Wear loss decreased gradually with the addition of milled B4C nanoparticles is identified for AZ91-xB4C nanocomposites. Coefficients of Friction (CoF) increased with an increase in load for AZ91-xB4C nanocomposites. Microhardness was linear with the increase in the wt. % of milled B4C nanoparticles. The worn surface micrograph was also studied using a scanning electron microscope.

Desta, D. T., Kelikay, G. N., Zekwos, M., Eshete, M., Reda, H. H., Alemayehu, F. R., & Zula, A. T. (2021). Influence of fermentation time on proximate composition and microbial loads of Enset, (Ensete ventricosum), sampled from two different agroecological districts. *Food Science and Nutrition*, 9(10), 5641–5647. Scopus. https://doi.org/10.1002/fsn3.2527

#### Abstract

In southern Ethiopian households, kocho is one of the staple foods which can be kept longer and fermented naturally using locally prepared pits, but evidence about the influences of fermentation of kocho at a different time and agroecology on proximate compositions and microbial loads are limited. Fermented kocho samples at different fermentation times were collected from highland and midland districts of Sidama region of Ethiopia. The standard procedure of AOAC (2005) method was followed. Four microbiological load analyses were conducted. Factorial analysis using JMP 13 was conducted. Across the fermentation time, total carbohydrate, ash, crude protein, and crude fat ranged 36%–40%, 1.9%–3.2%, 3%–4.3%, and 0.1%–0.3%, respectively. The highest total ash content was observed in week one of fermentation both in midland and highland samples. However, in midland, the increment of fermentation time showed a reduction of total ash percentage. Crude protein and fat were observed similar both in midland and highland (p > .05). The titrable acidity of Kocho varied from 0.16% to 0.22%. It was shown that it increased in the first three months of fermentation. It was also found to be increased as the fermentation time is increasing. Aerobic mesophilic, lactic acid bacteria, yeast, and mold were highly observed in Kocho as compared to Enterobacteriaceae. The loads varied across the fermentation time. Enterobacteriaceae and yeast and mold count of Kocho decreased with increased fermentation time. In conclusion, agroecology did not affect crude protein percentage as the fermentation time is increased. However, it was shown that fermentation increases protein and fat percentages. The increment of the acidic contents may also suppress the microbial growth for better food safety of kocho products.

Prakash, K. B., Fageehi, Y. A., Saminathan, R., Manoj Kumar, P., Saravanakumar, S., Subbiah, R., Arulmurugan, B., & Rajkumar, S. (2021). Influence of Fiber Volume and Fiber Length on Thermal and Flexural Properties of a Hybrid Natural Polymer Composite Prepared with Banana Stem, Pineapple Leaf, and S-Glass. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/6329400

# Abstract

There is more demand for natural fiber-reinforced composites in the energy sector, and their impact on the environment is almost zero. Natural fiber has plenty of advantages, such as easy recycling and degrading property, low density, and low price. Natural fiber's thermal properties and flexural properties are less than conventional fiber. This work deals with the changes in the thermal properties and mechanical properties of S-glass reinforced with a sodium hydroxide-treated pineapple leaf (PALF) and banana stem fibers. Banana stem and pineapple leaf fibers (PALF) were used at various volume fractions, i.e., 30%, 40%, and 50%, and various fiber lengths of 20 cm, 30 cm, and 40 cm with S-glass, and their effects on the thermal and mechanical properties were studied, and their optimum values were found. It was evidenced that increasing the fiber volume and fiber length enhanced the flexural and thermal properties up to 40% of the fiber volume, and started to decrease at 50% of the fiber volume. The fiber length provides an affirmative effect on the flexural properties and a pessimistic effect on the thermal properties. The PALF S-glass combination of 40% fiber load and 40 cm fiber length provides maximum flexural strength, flexural modulus, storage modulus, and lowest loss modulus based on hybrid Taguchi grey relational optimization techniques. PALF S-glass hybrid composite has been found to have 7.80%, 3.44%, 1.17% higher flexural strength, flexural modulus, and loss modulus, respectively, and 15.74% lower storage modulus compared to banana S-glass hybrid composite.

Arulmurugan, B., Balaji, D., Rajkumar, S., Kamaraj, M., Mageshwaran, V., Sathishkumar, M., Manikandan, M., & Arivazhagan, N. (2021). Influence of Filler Wire and Welding Process to Mitigate the Microsegregation of Alloy C-2000 Using Continuous and Pulsed Current Gas Tungsten Arc Welding Techniques. *Journal of Materials Engineering and Performance*, 30(8), 6050–6067. Scopus. https://doi.org/10.1007/s11665-021-05810-4

#### Abstract

This study examines the joining of a 4 mm thick plate of alloy C-2000 by continuous current gas tungsten arc welding (CCGTAW) and pulsed current gas tungsten arc welding (PCGTAW) techniques by using ERNiCrMo-4 (filler-4) and ERNiCrMo-17 (filler-17) as filler wires. This article aims to present a comprehensive structure-property relationship of these welded joints. Weld microstructure was characterized with optical microscope and scanning electron microscope. The results show that PCGTA weldments possess a refined microstructure compared to the CCGTA weldments in both filler wires. Energy-dispersive x-ray spectroscopy study divulged the existence of chromium (Cr)-rich and slight molybdenum (Mo)-rich segregation in the fusion zone interdendritic region of all the four weldments. However, the extent of microsegregation is very low in PCGTA-filler-4 weldment when compared with the other weld joints. Significant grain refinement (8.9 to 9.77%) was observed when shifting the welding mode from CCGTAW to PCGTAW. Weldment produced with PCGTAW-filler-4 offers higher tensile strength (~4 to 6%), higher toughness (~5 to 7.5%), and higher hardness (~3 to 6%) compared to other weldments.

Jeffrey, J. A., Sivakumar, A., Kumar, R. N., Anbazhagan, A., Manojkumar, G., Al Obaid, S., Alfarraj, S., Sivakumar, S., & Rajkumar, S. (2021). Influence of Flax Fibre Hybridization on Mechanical Behaviour of Sisal Fibre-Polypropylene Composites Prepared with an Injection Moulding Machine. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/4594465

#### Abstract

Due to their low weight, high specific strength, and low environmental impact, sisal fibrepolypropylene composites have gained popularity. However, the material has a low modulus and poor moisture resistance, among other shortcomings. This study investigated how flax fibre hybridization affects the physical parameters of sisal fibre-polypropylene composites. We used maleic anhydride-grafted polypropylene to improve compatibility between fibres and polypropylene. Adding flax fibres to polypropylene-silica composites resulted in increased tensile strength, flexibility, and impact strength, according to researchers. Water resistance was further improved by adding flax fibres. Tensile strength values of polypropylene-sisal fibre composites filled with 0, 5, 10, 15, and 20 wt% of flax fibres were 29.46, 30.56, 31.57, 33.12, and 34.64 MPa, respectively.

# Endalamaw, T. B., & Darr, D. (2021). Institutional and technological innovation for the bamboo sector as an instrument for development and climate change resilience in Ethiopia. *African Journal of Science, Technology, Innovation and Development*, *13*(7), 817–828. Scopus. https://doi.org/10.1080/20421338.2020.1837447

#### Abstract

Given a huge resource base, numerous product and service functions, bamboo can top many of the species recommended for integrated rural development in the context of climate change. Despite this potential, there is gap in knowledge and innovation to make optimum use of this resource. This study provides insights into the need for and processes of institutional and technological innovation to materialize bamboo's potential. The study is based on the theory of systems of innovation and empirical data collected from bamboo farmers, enterprises and 26 experts. The results demonstrate that traditional knowledge and technical skills in rural areas are key sources of knowledge for product innovation and climate change adaptation. The study reveals that enterprises have a primary role both in the generation of innovation and the production of value-added products. Institutional actors (GOs and NGOs) play an intermediary role in promoting bamboo sector innovation through training provision, policy development and stimulating social learning among actors. The study reveals that further effort is needed to upgrade the capacity of farmers and firms to produce globally competitive products. Therefore, development should be geared towards establishing and nurturing a bamboo sector innovation system which facilitates entry into the global value chain.

Tschopp, R., Gebregiorgis, A., Tassachew, Y., Andualem, H., Osman, M., Waqjira, M. W., Hattendorf, J., Mohammed, A., Hamid, M., Molla, W., Mitiku, S. A., Walke, H., Negron, M., Kadzik, M., & Mamo, G. (2021). Integrated human-animal sero-surveillance of brucellosis in the pastoral afar and somali regions of ethiopia. *PLoS Neglected Tropical Diseases*, *15*(8). Scopus. https://doi.org/10.1371/journal.pntd.0009593

#### Abstract

#### Background

Brucellosis is widespread in Ethiopia with variable reported prevalence depending on the geographical area, husbandry practices and animal species. However, there is limited information on the disease prevalence amongst pastoral communities, whose life is intricately linked with their livestock.

### Methodology

We conducted an integrated human-animal brucellosis sero-surveillance study in two adjacent pastoral regions, Afar and Somali region (SRS). This cross-sectional study included 13 woredas (districts) and 650 households. Blood samples were collected from people and livestock species (cattle, camel, goats and sheep). Sera were analyzed with C-ELISA for camels and shoats (sheep and goats), with I-ELISA for cattle and IgG ELISA for humans. Descriptive and inferential statistics analyses were performed.

#### Results

A total of 5469 sera were tested by ELISA. Prevalence of livestock was 9.0% in Afar and 8.6% in SRS (ranging from 0.6 to 20.2% at woreda level). In humans, prevalence was 48.3% in Afar and 34.9% in SRS (ranging from 0.0 to 74.5% at woreda level). 68.4% of all households in Afar and 57.5% of households in SRS had at least one animal reactor. Overall, 4.1% of animals had a history of abortion. The proportion of animals with abortion history was higher in seropositive animals than in seronegative animals. Risk factor analysis showed that female animals were significantly at higher risk of being reactors (p = 0.013). Among the species, cattle had the least risk of being reactors (p = 0.014). In humans, there was a clear regional association of disease prevalence (p = 0.002). The older the people, the highest the odds of being seropositive.

# Conclusion

Brucellosis is widespread in humans and animals in pastoral communities of Afar and SRS with the existence of geographical hotspots. No clear association was seen between human and particular livestock species prevalence, hence there was no indication as whether B. abortus or B. melitensis are circulating in these areas, which warrants further molecular research prior to embarking on a national control programs. Such programs will need to be tailored to the pastoral context.

Dharmaraj, R., Arunvivek, G. K., Karthick, A., Mohanavel, V., Perumal, B., & Rajkumar, S. (2021). Investigation of Mechanical and Durability Properties of Concrete Mixed with Water Exposed to a Magnetic Field. *Advances in Civil Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/2821419

# Abstract

Water is a crucial element in the concrete mix and is alone responsible for concrete work ability and cement hydration. The massive quantity of potable water consumed during the production of concrete is a concern. In general, fresh and hard concrete qualities are most influenced by the quantity and water quality. The use of magnetic water in concrete gives many benefits when it comes to increasing its properties. A substantial quantity of water can be saved by substituting potable water with magnetized water in concrete. In this study, the effects of magnetized water on the concrete's mechanical and durability properties were tested. Four different combinations were made using potable water and magnetic water. Mechanical properties including compression, flexural, tensile strength, and SEM analysis were evaluated. Water absorption, acid resistance, and corrosion resistance were all tested as part of the durability tests. According to the results of the experiments, employing magnetic water for concrete preparation and curing enhanced the mechanical properties and durability. Concrete mix MMMC prepared and subjected to curing using magnetized water has a 14.86% greater compressive strength than ordinary concrete. Similarly, tensile and flexural strength of mix MMMC amplified to 14.32% and 14.02%, respectively. Besides, the consumption of chemical admixtures also considerably reduced in magnetized water imbibed concrete.

Munimathan, A., Sathish, T., Mohanavel, V., Karthick, A., Madavan, R., Subbiah, R., Masi, C., & Rajkumar, S. (2021). Investigation on Heat Transfer Enhancement in Microchannel Using Al2O3/Water Nanofluids. *International Journal of Photoenergy*, 2021. Scopus. https://doi.org/10.1155/2021/6680627

#### Abstract

Nowadays, reducing heat generation in electronic devices while using microchannel cooling is used to solve this problem. Because the trend is globally marching toward the compact size, the component's dimensions get smaller, but the warmth involved within the component increases. Studies of heat transfer rate are conducted to determine the effect of a fully heated microchannel conductor's heat transfer performance. Experiments are performed using nanofluid Al2O3/water through a concentration percentage of 0.1% and 0.25% and deionized water through a microchannel conductor with 25 rectangular microchannel numbers with a dimension of  $(0.42 \times 0.42 \times 100)$  mm3. This present work deals with the effect of nanofluids and their concentration percentages. Finally, it concluded that better heat transfer performance was seen in nanofluids compared to deionized water. The reason is the high viscosity of nanofluid Al2O3/water due to these nanoparticles is deposited on the wall surface of the microchannel and outcomes trendy improvement in the heat transfer. Finally, a high concentration percentage of nanofluids revealed a practical improvement in the transfer of microchannel. As a result, 0.25% of the concentration percentage achieved a satisfactory result compared to the remaining fluids and almost 32.5% and 26% of thermal resistance decrease.

# Rajkumar, S., Arulmurugan, B., Teklemariam, A., Tafesse, D., Mekonnen, A., & Mulugeta, L. (2021). *Investigation on mechanical properties of AA2024/HBN composites prepared by stir casting method*. 47, 396–399. Scopus. https://doi.org/10.1016/j.matpr.2021.04.593

#### Abstract

The present study was used to improve the material properties such as tensile strength (UTS) and hardness (HV). hard boron nitride (HBN) reinforced AA2024 aluminum matrix composites (AMCs) was created through the stir casting process. The impact of different weight percentages of HBN (0%, 5%, 10%, 15%, 20%) filler on the mechanical properties of AMCs has been investigated. According to ASTM specifications, the hardness, tensile strength, and compression

strength of HBN filled, and unfilled base AA2024 alloy composites was measured. The results show that HBN filled AA2024 alloy strengthened HBN composites had improved mechanical properties than unfilled AA2024 base alloy.

# Verma, A., Singh, A., Anand, D., Aljahdali, H. M., Alsubhi, K., & Khan, B. (2021). IoT Inspired Intelligent Monitoring and Reporting Framework for Education 4.0. *IEEE Access*, 9, 131286–131305. Scopus. https://doi.org/10.1109/ACCESS.2021.3114286

# Abstract

Education 4.0 contemplates the involvement of emerging technologies like IoT (Internet of Things), Fog and cloud computing. Ubiquitous real-time monitoring in the challenging environment of an educational institution is the key requirement for proper implementation of Education 4.0 around the world. Conspicuously, this research presents a novel monitoring and irregularity detection framework for educational institutions. In this research, acquisition of data while deploying IoT is being suggested in the comprehensive environs of educational institutions. Pre-processing of acquired data for feature extraction is implemented using the Fog-Cloud nodes. Subsequently, the Temporal Chunk (TC), which is articulated with Temporal Data Mining, is further employed to detect irregularities based on SoTL (Set of threshold limits) and HAA (Historical Adversity Approximation). Successively, a Multi-Layered Bi-Directional Long Short Term Memory (M-Bi-LSTM) oriented irregularity prediction model is deployed. Furthermore, a fog-inspired alert generation and reporting module are employed for real-time reporting to notify the concerned stakeholder for in- time preventive action corresponding to a predicted irregularity. To authenticate the proposed framework and to avoid the experimental implementation cost, experimental simulations are performed. The experimental results verify that the proposed framework is capable of performing better in comparison to other contemporary decision-making methods for delay efficiency, data classification, irregularity prediction, and system stability. Moreover, the proposed framework can successfully estimate most of the irregularities in an educational environment and provide support for the proper implementation of Education 4.0 in a proficient and realistic manner.

Obsa, A. K., Tegene, Y., & Gebretsadik, A. (2021). Iron and folic acid supplementation compliance and associated factors among pregnant women attending antenatal clinic in Shalla district, southwest Ethiopia: A cross-sectional study. *Journal of Nutrition and Metabolism*, 2021. Scopus. https://doi.org/10.1155/2021/6655027

## Abstract

#### Background

Iron-folate supplementation for a pregnant mother is a cost-effective intervention to reduce iron deficiency anemia during pregnancy. The aim of this study was to assess the iron-folic acid supplements and associated factors among pregnant women attending antenatal clinics in the public health center of Shalla district, Southwest Ethiopia.

#### Methods

Institutional-based cross-sectional study design was conducted among 402 randomly selected pregnant mothers between February and April 2019. Data were collected using an interviewer-administered structured questionnaire from pregnant mothers attending antenatal care and using iron-folate supplements. Descriptive and multivariate logistic regression analyses were employed.

#### Results

Pill count compliance rate was found to be (154) 38.3%. Pregnant mothers who had anemia in their previous pregnancy [(AOR = 11.35, 95% CI: 4.76-27.03)], counseling on iron-folate supplements [(AOR = 11.39, 95% CI: 5.09-27.03)], awareness of the benefit of the iron-folate supplements [(AOR = 2.22, 95% CI: 1.18-3.92)], and being a member of the Health Development Army [(AOR = 2.11, 95% CI: (1.2, 3.9)] were significantly associated with compliance with iron-folate supplement.

# Conclusion

Compared to the World Health Organization cut-off point, the pill count compliance rate of ironfolate supplementation among pregnant women in the study area was very low. Previous history of anemia and lack of knowledge about its benefit were some of the factors associated with it. Therefore, the healthcare providers should give continuous awareness creation and counseling services focusing on the benefit of iron-folate supplementation for pregnant mothers and their neonates. Orsango, A. Z., Habtu, W., Lejisa, T., Loha, E., Lindtjørn, B., & Engebretsen, I. M. S. (2021). Iron deficiency anemia among children aged 2–5 years in southern Ethiopia: A communitybased cross-sectional study. *PeerJ*. Scopus. https://doi.org/10.7717/peerj.11649

#### Abstract

#### Background

Iron-deficiency anemia (IDA) is a common type of nutritional anemia in low-income countries, including Ethiopia. However, there is limited data on iron deficiency anemia prevalence and associated factors in Ethiopia, particularly for children aged 2 to 5 years. Objectives: To establish the prevalence of iron deficiency anemia and associated risk factors, focusing on iron-rich food consumption among children aged 2 to 5 years in southern Ethiopia.

#### Methods

A community-based cross-sectional study was conducted in southern Ethiopia in 2017, involving 331 randomly selected children aged 2 to 5 years old. A structured questionnaire was used to collect information about the children and the households. Venous blood was collected from each child in a test tube to measure hemoglobin, ferritin, and C-reactive protein (CRP). Hemoglobin levels were determined using HemocueÒ301 and adjusted for altitude. Anemia was defined as hemoglobin levels <11 g/dl. Ferritin was adjusted for inflammation based on CRP concentration and low ferritin concentration defined as adjusted ferritin concentration &lt;12  $\mu$ g/L. IDA was considered when a child had both hemoglobin level <11g/dl and low ferritin concentration. Bivariable and multivariable logistic regression models were performed to identify factors associated with IDA and iron-rich food consumption.

#### **Results**

The prevalence of iron deficiency anemia was 25%, and the total anemia prevalence was 32%. Only 15% of children consumed iron-rich foods in the preceding 24 h, and 30% of children consumed iron-rich foods at least once in the preceding week. IDA decreased as the height for age z-score increased (Adjusted Odds Ratio 0.7; 95% CI [0.5-0.9]). Mothers with increased educational level (AOR 1.1; 1.0–1.2) and households with increased dietary diversity (AOR 1.4; 1.2–1.6) consumed more iron-rich foods.

### Conclusions

Iron deficiency anaemia was a moderate public health problem in southern Ethiopia, and the ironrich food consumption was low. Interventions should focus on food supplementation and fortification, food diversification and nutritional education, and promoting women's education.

Abda, S., Haile, T., & Abera, M. (2021). Isolation, identification antimicrobial susceptibility and associated risk factors of Salmonella in semi-intensive poultry farms of Kafa zone, Southwest Ethiopia. *Veterinary and Animal Science*, 14. Scopus. https://doi.org/10.1016/j.vas.2021.100206

#### Abstract

Salmonellosis is one of the major causes of poultry disease. The study aimed to isolate, identify, determine susceptibility and associated risk factors of salmonella specious in semi-intensive poultry farms of Kafa zone, southwest Ethiopia. A cross-sectional study was conducted on four purposively selected districts. Three farms were randomly selected per district and fecal samples were taken from a total of 302 chickens. Questionnaire was administered to farm owners and data was analyzed using STATA statistical software package. The overall prevalence of Salmonella enterica species in Kafa zone was 9.27% with Gimbo district 10.39%, Bita district 10.66%, Shishoende district 12% and Chena district 4%. Source of chickens, farm types and breed risk factors showed significant association (P < 0.05) with the disease prevalence. Having diarrhea and continuous farm systems significantly associated (P < 0.05). All isolates were 100% resistant to Oxtytetracycline and Ampicillin. Among 28 isolated Salmonella enterica species, 92.85% (n = 26) of them were showed multidrug resistance while 2 (7.14%) of them showed extensively drug resistance. Half of multidrug-resistant isolates were resistant to 5–6 antimicrobials, while 7.14% of isolates showed resistance to 7 antimicrobials. This study shows prevalence of Salmonella and its association with the breed, farm type, source of chicken and presence of diarrhea. A high antimicrobial resistance observed shows presence of concerns due to the emergence of Antimicrobial Resistance (AMR) in the poultry farms. Therefore, awareness should be created to the farmers on measures to avoid the risk factors of poultry disease and the occurrence of antimicrobials resistance in poultry farms.

Williams, J. E., McGuire, M. K., Meehan, C. L., McGuire, M. A., Brooker, S. L., Kamau-Mbuthia, E. W., Kamundia, E. W., Mbugua, S., Moore, S. E., Prentice, A. M., Otoo, G. E., Rodríguez, J. M., Pareja, R. G., Foster, J. A., Sellen, D. W., Kita, D. G., Neibergs, H. L., & Murdoch, B. M. (2021). Key genetic variants associated with variation of milk oligosaccharides from diverse human populations. *Genomics*, *113*(4), 1867–1875. Scopus. https://doi.org/10.1016/j.ygeno.2021.04.004

# Abstract

Human milk oligosaccharides (HMO), the third most abundant component of human milk, are thought to be important contributors to infant health. Studies have provided evidence that geography, stage of lactation, and Lewis and secretor blood groups are associated with HMO profile. However, little is known about how variation across the genome may influence HMO composition among women in various populations. In this study, we performed genome-wide association analyses of 395 women from 8 countries to identify genetic regions associated with 19 different HMO. Our data support FUT2 as the most significantly associated (P < 4.23–9 to P &lt; 4.5–70) gene with seven HMO and provide evidence of balancing selection for FUT2. Although polymorphisms in FUT3 were also associated with variation in lacto-N-fucopentaose II and difucosyllacto-N-tetrose, we found little evidence of selection on FUT3. To our knowledge, this is the first report of the use of genome-wide association analyses on HMO.

Leslie, J. F., Moretti, A., Mesterházy, Á., Ameye, M., Audenaert, K., Singh, P. K., Richard-Forget, F., Chulze, S. N., Del Ponte, E. M., Chala, A., Battilani, P., & Logrieco, A. F. (2021). Key global actions for mycotoxin management in wheat and other small grains. *Toxins*, 13(10). Scopus. https://doi.org/10.3390/toxins13100725

#### Abstract

Mycotoxins in small grains are a significant and long-standing problem. These contaminants may be produced by members of several fungal genera, including Alternaria, Aspergillus, Fusarium, Claviceps, and Penicillium. Interventions that limit contamination can be made both preharvest and post-harvest. Many problems and strategies to control them and the toxins they produce are similar regardless of the location at which they are employed, while others are more common in some areas than in others. Increased knowledge of host-plant resistance, better agronomic methods, improved fungicide management, and better storage strategies all have application on a global basis. We summarize the major pre- and post-harvest control strategies currently in use. In the area of pre-harvest, these include resistant host lines, fungicides and their application guided by epidemiological models, and multiple cultural practices. In the area of post-harvest, drying, storage, cleaning and sorting, and some end-product processes were the most important at the global level. We also employed the Nominal Group discussion technique to identify and prioritize potential steps forward and to reduce problems associated with human and animal consumption of these grains. Identifying existing and potentially novel mechanisms to effectively manage mycotoxin problems in these grains is essential to ensure the safety of humans and domesticated animals that consume these grains.

# Senbeta, A. M., Mamo, F. T., Desalegn, B. B., & Daba, A. K. (2021). Knowledge and practices of iodized salt utilization, health consequences, and iodine concentration on dietary salts at retailer and households in Jigjiga town, Somali, Ethiopia. *Cogent Food and Agriculture*, 7(1). Scopus. https://doi.org/10.1080/23311932.2021.1911421

# Abstract

To warrant adequate supplementation of iodine at the consumer level, monitoring and evaluating the concentration of iodine in salt is an essential element of a programme to eliminate iodine deficiencies. This study aimed to determine the adequacy level of iodine concentration in dietary salt at the retailers and household level, and also to assess the level of knowledge and practices of iodized salt utilization in Jigjiga, Somali, Ethiopia. A community-based cross-sectional study using simple random systematic sampling was employed. Salt samples were collected from 90 households and 30 retailer shops. Nearly 88% of households and 80% of retailers had iodized salt. However, only 31.1% and 30% of the households and retailer shops had adequately iodized salt, respectively. Three-fourth (75%) of the participants ever heard about iodized salt. Only 31.3% and 8% of participants obtained information about adverse health effect of iodine and its preventive mechanisms from mass media and health workers, respectively. More than one-thirds (40.6%) of the participants' never used iodized salt due to its high price. The presence of iodine in the salt affected 38% of the participant's taste. About 88% of the participants were storing dietary salt in a container with lid and/or polyethylene bag. Therefore, consistent and regular monitoring of iodized salt along the value chain should consider the availability and affordability.

Yoseph, A., Tamiso, A., & Ejeso, A. (2021). Knowledge, attitudes, and practices related to COVID-19 pandemic among adult population in Sidama Regional State, Southern Ethiopia: A community based cross-sectional study. *PLoS ONE*, *16*(1 January). Scopus. https://doi.org/10.1371/journal.pone.0246283

### Abstract

#### Introduction

COVID-19 incidence is increasing and different measures have been adopted to control the spread of the pandemic in Ethiopia. Among these measures, enhancing the knowledge, positive attitudes, and proper practices of prevention measures about the disease is a basic strategy to control it. However, community compliance to control measures is largely dependent on their knowledge, attitudes, and practices (KAP) towards COVID-19. Objective To assess the current level of KAP towards COVID-19 pandemic and predictors among the rural dwellers in Sidama regional state, Southern Ethiopia; 2020.

# Methods

This community-based prospective cross-sectional study was carried out from May 1-30, 2020 on a sample of 1,278 adult populations in Sidama regional state, Southern Ethiopia. A multi-stage sampling technique was used to choice the study participants. The data were collected using a structured interviewer-administered questionnaire. We have entered data using Epi data version 3.1 and all analyses were done using SPSS version 25. KAPs scores of study participants based on their independent variables were compared using Chi-square test, t-test or one-way analysis of variance (ANOVA) as required. Bi-variable and multivariable logistic regression analyses were used to identify factors associated with KAP. The important assumptions of the logistic regression model were checked to be satisfied. Adjusted odds ratios (AOR) with a 95% confidence interval (CI) were calculated to assess the existence and strength of associations.

## Results

From a total of 1,214 study participants, the overall attained knowledge, attitude and practice score about COVID-19 were 90%, 82.4% and 65%, respectively. Among these, 43.9%, 37.5%, and 24.4% of the study participants had demonstrated good knowledge, high attitude and proper practice, respectively. The mean knowledge scores were significantly different between sex, categories of marital status, educational levels, main occupation, and the monthly income quintiles

of the study participants (p<0.05). Similarly, the mean attitude scores significantly varied across educational levels, main occupations and marital status (p<0.05). Based on multivariable logistic regression analysis, main occupation of the government employees, education level of diploma and above, highest and second highest wealth rank were positively associated with COVID-19 prevention and control practice.

# Conclusions

The majority of study participants had showed good knowledge and optimistic attitude toward COVID-19. But, the level of practice lower than that expected to maximize effective control measures. Further public education interventions and community sensitization campaigns are required for rural adult population in the Sidama regional state, Ethiopia.

# Getu Engida, T., Nigussie, T. A., Aneseyee, A. B., & Barnabas, J. (2021). Land Use/Land Cover Change Impact on Hydrological Process in the Upper Baro Basin, Ethiopia. *Applied and Environmental Soil Science*, 2021. Scopus. https://doi.org/10.1155/2021/6617541

#### Abstract

Understanding the hydrological process associated with Land Use/Land Cover (LU/LC) change is vital for decision-makers in improving human wellbeing. LU/LC change significantly affects the hydrology of the landscape, caused by anthropogenic activities. The scope of this study is to investigate the impact of LU/LC change on the hydrological process of Upper Baro Basin for the years 1987, 2002, and 2017. The Soil Water Assessment Tool (SWAT) model was used for the simulation of the streamflow. The required data for the SWAT model are soils obtained from the Food and Agriculture Organization; Digital Elevation Model (DEM) and LU/LC were obtained from the United States Geological Survey (USGS). The meteorological data such as Rainfall, Temperature, Sunshine, Humidity, and Wind Speeds were obtained from the Ethiopian National Meteorological Agency. Data on discharge were obtained from Ministry of Water, Irrigation and Electricity. Ecosystems are deemed vital. Landsat images were used to classify the LU/LC pattern using ERDAS Imagine 2014 software and the LU/LC were classified using the Maximum Likelihood Algorithm of Supervised Classification. The Sequential Uncertainty Fitting (SUFI-2) global sensitivity method within SWAT Calibration and Uncertainty Procedures (SWAT-CUP) was used to identify the most sensitive streamflow parameters. The calibration was carried out using observed streamflow data from 01 January 1990 to 31 December 2002 and a validation

period from 01 January 2003 to 31 December 2009. LU/LC analysis shows that there was a drastic decrease of grassland by 15.64% and shrubland by 9.56% while an increase of agricultural land and settlement by 18.01% and 13.01%, respectively, for 30 years. The evaluation of the SWAT model presented that the annual surface runoff increased by 43.53 mm, groundwater flow declined by 27.58 mm, and lateral flow declined by 5.63 mm. The model results showed that the streamflow characteristics changed due to the LU/LC change during the study periods 1987-2017 such as change of flood frequency, increased peak flows, base flow, soil erosion, and annual mean discharge. Curve number, an available water capacity of the soil layer, and soil evaporation composition factor were the most sensitive parameters identified for the streamflow. Both the calibration and validation results disclosed a good agreement between measured and simulated streamflow. The performance of the model statistical test shows the coefficient of determination (R2) and Nash-Sutcliffe (NS) efficiency values 0.87 and 0.81 for calibration periods of 1990-2002 and 0.84 and 0.76 for the validation period of 2003 to 2009, respectively. Overall, LU/LC significantly affected the hydrological condition of the watershed. Therefore, different conservation strategies to maintain the stability and resilience of the ecosystem are vital.

# Allito, B. B., Ewusi-Mensah, N., Logah, V., & Hunegnaw, D. K. (2021). Legume-rhizobium specificity effect on nodulation, biomass production and partitioning of faba bean (Vicia faba L.). *Scientific Reports*, *11*(1). Scopus. https://doi.org/10.1038/s41598-021-83235-8

# Abstract

Greenhouse and multi-location experiments were conducted for two consecutive years to investigate the effects of rhizobium on nodulation, biomass production and partitioning of faba bean. Split-plot in randomized complete block design was used for field experiments. Treatments consisted of six rhizobium strains and three faba bean varieties. Peat carrier-based inoculant of each strain was applied at the rate of 10 g kg–1 seed. Non-inoculated plants without N fertilizer and with N fertilizer served as –N and + N controls, respectively. Data on nodulation, shoot dry weight and root dry weight were collected and analyzed. Inoculation of rhizobium significantly increased nodulation of faba bean under greenhouse and field conditions. Location x strain x variety interaction had significant effects on nodulation, dry matter production and partitioning. Rhizobium inoculation increased nodulation, shoot and root dry weights of faba bean across locations. For example, inoculation with rhizobium strains NSFBR-15 and NSFBR-12 to variety

Moti resulted in 206.9 and 99.3% shoot dry weight increase at Abala Gase and Hankomolicha, respectively and 133.3 and 70.7% root dry weight increase on the same variety at the same sites, respectively. Nodulation and biomass production depend on the compatibility between faba bean genotype and rhizobium strain and its interaction with soil bio-physical conditions.

Abdisa, S., & Tenaw, Z. (2021). Level of adherence to option B plus PMTCT and associated factors among HIV positive pregnant and lactating women in public health facilities of Hawassa city, Southern Ethiopia. *PLoS ONE*, *16*(8 August). Scopus. https://doi.org/10.1371/journal.pone.0255808

# Abstract

#### Background

Adherence to antiretroviral therapy is very essential to achieve a great outcome of drugs via suppressing viral load, preventing multidrug resistance, and reducing mother to a child transmission rate of the Human Immune Virus. Objective This study aimed to assess the level of adherence to option B plus PMTCT and associated factors among HIV Positive pregnant and lactating women in public health facilities of Hawassa city, Southern Ethiopia, 2020 G.C.

# Methods

Institution-based cross-sectional study was done on 254 HIV-positive pregnant and lactating women attending the prevention of mother-to-child transmission (PMTCT) follow-up. Participants were selected by simple random sampling. Data collected through a structured interviewer-administered questionnaire were cleaned and entered into Epi-data 3.1 and exported to SPSS 20 for statistical analysis. Descriptive analysis was done. Bivariable and multivariable logistic regressions were done to measure the strength of association between independent and dependent variables using the odds ratio and 95% of confidence interval. A p-value <0.05 was taken as statistically significant.

# Result

The overall adherence level to option B+ was 224 (88.2%). Respondents in age group of  $\ge 25$  [AOR = 0.12, 95% CI (0.03, 0.42)], with no formal education [AOR = 0.12, 95% CI (0.03, 0.51)], experienced drug side effects [AOR = 0.11, 95% CI (0.04, 0.32)], have good knowledge of PMTCT [AOR = 3.6, 95% CI (1.16, 11.3)], and get support from partner/family [AOR = 4.5, 95% CI (1.62, 12.4)] were identified associated factors with adherence level.

# Conclusion

The level of adherence to option B plus PMTCT was 88.2% which is suboptimal. Ages, educational level, knowledge on PMTCT, getting support from partner/family, and drug side effect were significantly associated with adherence. Therefore, educating and counseling on the service of PMTCT to improve their knowledge and encouraging partner/family involvement in care are mandatory to achieve the standard adherence level.

Asferaw, M., Tolesa, K., Sherief, S. T., Tadegagne, B., Sintayehu, M., Worku, A., Wondale, T., Girma, E., Gizachew, Z., Gilbert, C., & Woodruff, G. (2021). Limitations in cataract surgical services for children in Ethiopia: A nationwide survey of pediatric cataract surgeons. *BMC Ophthalmology*, 21(1). Scopus. https://doi.org/10.1186/s12886-021-02190-0

#### Abstract

# Background

Bilateral cataract is a significant cause of blindness in children in Ethiopia. This study aimed to identify the resources available for cataract surgery in children, and to assess current surgical practices, surgical output and factors affecting the outcome of surgery in Ethiopia.

#### Methods

A Google Forms mobile phone questionnaire was emailed to nine ophthalmologists known to perform cataract surgery in young children (0–5 years).

#### **Results**

All nine responded. All but one had received either 12- or 3–5-month's training in pediatric ophthalmology with hands-on surgical training. The other surgeon had received informal training from an experienced colleague and visiting ophthalmologists. The surgeons were based in seven health facilities: five in the capital (Addis Ababa) and eight in six public referral hospitals and one private center. Over 12 months (2017–2018) 508 children (592 eyes) aged 0–18 years (most < 15 years) were operated by these surgeons. 84 (17%) had bilateral cataract, and 424 (83%) had unilateral cataract mainly following trauma. A mean of 66 (range 18–145) eyes were operated per surgeon. Seventy-one additional children aged > 5 years were operated by other surgeons. There were substantially fewer surgeons per million population (nine for 115 million population) than recommended by the World Health Organization and they were unevenly distributed across the country. Methylcellulose and rigid intraocular lenses were generally available but less than 50%

of facilities had a sharp vitrectomy cutter and cohesive viscoelastic. Mean travel time outside Addis Ababa to a facility offering pediatric cataract surgery was 10 h.

# Conclusion

Despite the high number of cases per surgeon, the output for bilateral cataracts was far lower than required. More well-equipped pediatric ophthalmology teams are urgently required, with deployment to under-served areas.

# Negash, M., & Starr, M. (2021). Litter decomposition of six tree species on indigenous agroforestry farms in south-eastern Ethiopia in relation to litterfall carbon inputs and modelled soil respiration. *Agroforestry Systems*, 95(4), 755–766. Scopus. https://doi.org/10.1007/s10457-021-00630-w

#### Abstract

The indigenous agroforestry systems practised by smallholders in south-eastern Ethiopia have high biodiversity and productivity. However, little is known about their carbon (C) inputs and outputs. We carried out a 1-year litterbag study to determine leaf litter decomposition k constants for six woody species common to these agroforestry systems. The k values were then used to calculate the decomposition C losses from measured litterfall C fluxes and the results compared to modelled soil respiration (Rs) C losses. Litterbag weight loss at the end of the year was 100% or nearly so, k values 2.582-6.108 (yr-1) and half-life 41-112 days. k values were significantly (p = 0.023) correlated with litter N contents, nearly so with C/N ratios (p = 0.053), but not with other nutrients (Ca, Mg and K), and negatively correlated with temperature (p = 0.080). Using species, farm elevation, temperature and litter quality as predictors, partial least squares regression explained 48% of the variation in k. Depending on species, estimated decomposition C losses from litterfall were 18 to 58% lower than annual litterfall C inputs. Using a heterotrophic respiration (Rh) to Rs ratio of 0.5, modelled Rh C losses were 89 to 238% of litterfall decomposition C losses estimated using k values. However, using an Rh/Rs ratio of 0.27, which is appropriate for tropical humid forests, Rh C losses were 11 to 138% of estimated litterfall decomposition C losses. Our decomposition and soil respiration estimates indicate that litterfall is sufficient to maintain soil organic C contents and thereby the soil fertility of these unique agroforestry systems.

# Mengistu, S., Nurfeta, A., Tolera, A., Bezabih, M., Adie, A., Wolde-Meskel, E., & Zenebe, M. (2021). Livestock Production Challenges and Improved Forage Production Efforts in the Damot Gale District of Wolaita Zone, Ethiopia. *Advances in Agriculture*, 2021. Scopus. https://doi.org/10.1155/2021/5553659

#### Abstract

This study was conducted to identify major livestock production constraints and improved forage production efforts in the Damot Gale district. Four representative kebeles, two associated with our NGO project and two from nonproject outreach activities, were selected. Forty farmers from each kebele were randomly chosen for the purpose of individual interviews using a semistructured questionnaire. Data collected were analyzed using SPSS (version 20) and Excel. The topmost livestock production constraint was feed shortage where a larger proportion of farmers (75.6%) suffered from the problem with higher ( $p \le 0.01$ ) severity in nonproject intervention areas. Of these, 38.6% were challenged for a period of three months while another 61.4% suffered for about four months. Purchasing grass (31.4%) and concentrate (33.5%) and feeding enset (Ensete ventricosum) leaf (21.49%) were the most commonly adopted coping mechanisms to alleviate feed shortages during the dry season, while using purchased grass and enset leaf was the main coping strategy in nonproject intervention ( $p \le 0.01$ ) areas. The majority of households (90.75%) participate in improved forage production regardless of farm size. Desho grass (Pennisetum pedicellatum) (71.38%) and elephant grass (Pennisetum purpureum) (42.63%) are the most common improved forages in both study areas. These forages are produced for the purpose of two or more functions (feed, cash, and preventing erosion) that vary ( $p \le 0.01$ ) among intervention status. Major niche locations adopted for improved forage production include farm land, soil and water conservation structures, and perimeter fencing. Greatest constraints on improved forage production were seed/material shortage followed by land shortage and lack of awareness. Project intervention ( $p \le 0.01$ ), tropical livestock unit (TLU) holding ( $p \le 0.01$ ), and forage seed/planting material access (p < 0.05) were identified as factors (among others) having significant relationship with improved forage development. Strong extension services and efficient input delivery for farmers are vital to support profitable livestock production and resource utilization.

van de Ven, G. W. J., de Valença, A., Marinus, W., de Jager, I., Descheemaeker, K. K. E., Hekman, W., Mellisse, B. T., Baijukya, F., Omari, M., & Giller, K. E. (2021). Living income benchmarking of rural households in low-income countries. *Food Security*, *13*(3), 729–749. Scopus. https://doi.org/10.1007/s12571-020-01099-8

#### Abstract

The extreme poverty line is the most commonly used benchmark for poverty, set at US\$ 1.90 by the World Bank. Another benchmark, based on the Anker living wage methodology, is the remuneration received for a standard work week necessary for a worker to meet his/her family's basic needs in a particular place. The living wage concept has been used extensively to address incomes of plantation workers producing agricultural commodities for international markets. More recently intense discussion has emerged concerning the 'living income' of smallholder farmers who produce commodities for international supply chains on their own land. In this article we propose a simple method that can be used in all types of development projects to benchmark a rural 'living income'. We launch the Living Income Methodology, as adapted from the Living Wage Methodology, to estimate the living income for rural households. In any given location this requires about one week of fieldwork. We express it per adult equivalent per day (AE/day) and data collection is focused on rural households and their immediate surroundings. Our three case studies showed that in 2017 in Lushoto District, rural Tanzania, the living income was US\$ PPP 4.04/AE/day, in Isingiro District, rural Uganda, 3.82 and in Sidama Zone, rural Ethiopia, 3.60. In all cases, the extreme poverty line of US\$ PPP 1.90 per capita per day is insufficient to meet the basic human rights for a decent living in low-income countries. The Living Income Methodology provides a transparent local benchmark that can be used to assess development opportunities of rural households, by employers in rural areas, including farmers hiring in labour, while respecting basic human rights on a decent living. It can be used to reflect on progress of rural households in low-income countries on their aspired path out of poverty. It further provides a meaningful benchmark to measure progress on Sustainable Development Goal 1, eliminating poverty, and 2, zero hunger and sustainable food systems, allowing for consideration of the local context.

Tiwari, B., Damena, S., Urgessa, T., Jain, S., & Kumar Sharma, H. (2021). Load balancing *Technique toward Congestion minimization in WSN-enabled-Healthcare*. 2021 IEEE International Conference on Technology, Research, and Innovation for Betterment of Society, TRIBES 2021. Scopus. https://doi.org/10.1109/TRIBES52498.2021.9751667

### Abstract

Nowadays, WSN is effectively using in healthcare application by means of body area network, which is senor-based wearable devices mainly utilized in health care prevention and monitoring applications. Limited resources make the WSN easily suffer from the problem of congestion, which degrade the performance of the network and hence reduced the reliability, which is most important requirement for WSN enabled healthcare. The objective of this paper is to design a routing protocol which can minimize communication delay and gain higher throughput with optimum network overhead. Proposed work present Load balancing technique toward Congestion minimization in WSN-enabled-Healthcare named LC-AOMDV mechanism. This mechanism utilizes calculation and regulation of queue length of intermediate nodes and reduced the data sending rate dynamically to avoid the congestion from the network. The proposed mechanism uses multi-hop multi-path routing and integrated into existing normal AOMDV routing protocol for efficient communications and more reliable health data delivery. The proposed work is simulated into Network Simulator 2.31 and results obtained are compared with results of existing routing technique. The results are analyzed by means of performance metrics like data/packet drops, PDR, routing overhead, throughput. Analysis shows that PDR is increased by around 4%, delay is decreased by 0.13 ms, and throughput is increased by 400 Kbps as compared to normal AOMDV. The proposed mechanism concluded and ensured that it gives better performance over existing technique and increase the reliability to transfer healthcare data.

# Lemma, B., Williams, S., & Paustian, K. (2021). Long term soil carbon sequestration potential of smallholder croplands in southern Ethiopia with DAYCENT model. *Journal of Environmental Management*, 294. Scopus. https://doi.org/10.1016/j.jenvman.2021.112893

#### Abstract

Considering the importance of soil organic carbon (SOC) and the scarcity of data on how soil management influences its storage in the region, this study assessed the long-term impact of different soil management systems on SOC in southern Ethiopia using the DAYCENT model. The conservation management systems considered were minimum tillage, crop residue (CR) retention, fertilization and their combinations. We parameterized the model with data from studies in the literature. We then modeled conventional cropping system for smallholding farms over a 30-year period (1991-2020) as the business as usual scenario (BAU). Then we assessed the impact of alternative conservation management scenarios compared with the BAU scenario. Our results indicated that the conservation management scenarios increased SOC at 0-20 cm depth in the range 0.34–9.71 Mg C ha-1 over 30 years when compared to BAU practices. The individual effect of fertilization, CR retention or minimum tillage management practices on SOC stock were lower than the response of the combined conservation management practices. The combined 50%–75% CR retention, no-tillage (NT), and 32 kg N ha-1 fertilization provided the highest SOC sequestration. These combinations, increased SOC in the range 8.10-9.71 Mg C ha-1 over 30 years equivalent to rates of 0.27–0.32 Mg C ha-1 yr-1. While long-term empirical data from field experiments are lacking, model results suggest that the combined 50-75% CR retention, NT, and increased N fertilization have a potential to increase SOC sequestration in resource-limited smallholding croplands. The results may be useful for researchers, policy maker and other stakeholders.

Fenta, D. A., Wube, T. B., & Nuru, M. M. (2021). Long-Term Immunological and Virological Outcomes in Children Receiving Highly Active Antiretroviral Therapy at Hawassa University College of Medicine and Health Sciences, Southern Ethiopia. *Journal of Immunology Research*, 2021. Scopus. https://doi.org/10.1155/2021/2498025

# Abstract

Purpose. To determine immunological and virological failure and associated factors among children infected with human immunodeficiency virus receiving antiretroviral treatments at Hawassa University Hospital, Southern Ethiopia. Methods. A hospital-based cross-sectional study was conducted among 273 HIV-infected children from July 1 to December 1, 2019. Data were collected using a structured questionnaire and review of patient records. Blood samples for viral load and CD4 count were collected. Data were analyzed using SPSS version 20. Significance group comparison was done by the Kaplan-Meier log-rank test. The Cox proportional hazard model was used to select significant factors of the variability between groups. Results. A total of 273 children, between the age ranges of 1 to 14 years, were included. Of these, 139 (50.9%) and 134 (49.1%) were males and females, respectively. Children from the rural area were almost five times more vulnerable for virological and immunological failure than those children from the urban area (AOR=4.912, (1.276-8.815), P=0.032). The overall viral load suppression was 196 (71.8%) with a good adherence of 226 (82.9%). Nonsuppressed HIV viral load was found to be 77 (28.2%) which had two times more viral load copies (AOR=2.01, (1.21-2.66), P=0.001) when compared to those who had suppressed viral load copies. The proportions of children who had immunological nonresponse were 45.6% (21 out of 46), 30.4% (14 out of 46), and 23.9% (11 out of 46) among children with baseline CD4 of <200, 201-500, and >500 cells/µl, respectively. Unimproved outcomes among females were noted for immunological and virological failure in this study (AOR=1.901, (1.038-3.481), P=0.038). Conclusion. In conclusion, the highly active antiretroviral treatment appeared highly effective in terms of immunological and virological longterm outcomes. However, viral suppression (71.8%) in our study was far apart from the UNAIDS target of 90% in 2020. For that reason, strengthening adherence counseling and early initiation of HAART is important.

Areru, H. A., Dangisso, M. H., & Lindtjørn, B. (2021). Low and unequal use of outpatient health services in public primary health care facilities in southern Ethiopia: A facility-based cross-sectional study. *BMC Health Services Research*, 21(1). Scopus. https://doi.org/10.1186/s12913-021-06846-x

#### Abstract

#### Background

Outpatient department visits per individual for each year are one of the core indicators of healthcare delivery to assess accessibility or quality of services. In addition, this study aimed to assess health service utilisation and disease patterns in southern Ethiopia, by including the health authorities' suggestions to improve the services. No study has assessed this in Ethiopia previously.

#### Methods

An institution-based cross-sectional design study was done in 65 primary health care units in Dale and Wonsho districts, in Sidama region, for all patients visiting health facilities from 1 July 2017 to 30 June 2018. We estimated the utilisation rate as visits per person per year, the odds ratio for health use and proportions of diseases' diagnoses. The results of our study were presented to local health authorities, and their suggestions for improvements were incorporated into the analysis.

# Result

A total of 81,129 patients visited the health facilities. The annual outpatient health service utilisation was 0.18 (95% CI: 0.18–0.19) new visits per person per year. The health service utilisation rate per year for the rural population was lower than the urban utilisation by 91% (OR = 0.09; 95% CI: 0.08–0.09). Children in the age group of 5–14 years had lower odds of health service utilisation by 78% (OR = 0.22; 95% CI: 0.21–0.23), compared to children under 5 years of age. Females were four times (OR = 4.17; 95% CI: 4.09–4.25) more likely to utilise health services than males. Febrile illness constituted 17.9% (14,847 of 83,148) of the diagnoses in all age groups. Almost half of the febrile cases, 46.5% (3827 of 8233), were among children under 5 years of age. There were very few cases of non-communicable diseases diagnosed in the health facilities. The health authorities suggested improving diagnostic capacities at health centres, enhancing health professionals' skill and attitudes, and improving affordability and physical accessibility of the services.

# Conclusion

The health service utilisation rate was low in Sidama. The use of health services was lower among rural residents, men, children and elderly, and health post users. Improving the quality, affordability and accessibility of the health services, by involving responsible stakeholders could increase service usage.

Shehmolo, M., Gari, T., Tesfaye, D. J., Boti, N., & Oumer, B. (2021). Magnitude and factors associated with hygiene practice among primary school children in mareko district, Southern Ethiopia: A cross-sectional study. *Journal of Multidisciplinary Healthcare*, *14*, 311–320. Scopus. https://doi.org/10.2147/JMDH.S285954

# Abstract

#### Background

Poor school hygiene practice is a major health problem in developing countries, including Ethiopia, and is a leading factor for children's school absenteeism due to hygiene-related illnesses. To our knowledge, little is known about hygiene practice conducted in southern Ethiopia including our study area. Therefore, the objective of this study was to assess magnitude and associated factors of hygiene practice among primary school children in Mareko District.

## Methods

A school-based cross-sectional study design with multi-stage sampling was conducted from January 15–30, 2018 in Mareko district. Out of 25 second cycle primary schools in the district, eight schools (30%) were recruited with a simple random method. Then, a sample size of 829 students was selected by a simple random method. A self-administered questionnaire was used to collect data. Data were entered into Epi Info V. 7 and then analyzed in SPSS V. 20. Multivariate logistic regression analysis was used to identify independent factors of hygiene practice.

#### Results

The magnitude of overall good hygiene practice was 252 (30.4%) with 95% CI (27.3–33.5%). Practices of hand washing, latrine utilization, and water handling were found to be 191 (23%), 387 (46.7%), and 238 (28.7%), respectively. In multivariate analysis, factors associated with hygiene practice were found to be knowledge on hand washing (AOR = 5.1, 95% CI 2.86–9.1) and latrine use (AOR = 1.99, 95% CI 1.06– 3.75); ever visited model school (AOR = 2.44, 95% CI 1.28–

4.64); being 14–18 years old (AOR = 1.42; 95% CI 1.3–1.88); and cleanliness of toilets (AOR = 3.4; 95% CI 1.77–6.55).

# Conclusion

Overall, good hygiene practice among primary school children in Mareko District was low. Therefore, there should be continuous awareness of good hygiene practice and its impact on health through health education, strengthening and motivation of water, sanitation, and hygiene clubs, and also visits to model primary schools in the district.

Wachamo, D., Bonja, F., Tadege, B., & Hussen, S. (2021). Magnitude of parasitic infections and associated factors among pregnant women at health facilities in Hawassa, Southern Ethiopia. *F1000Research*, *10*. Scopus. https://doi.org/10.12688/f1000research.27584.1

# Abstract

# Background

Intestinal parasitic infections (IPIs) are common problems during pregnancy, with adverse outcomes including low birth weight and prenatal mortality. The burden of parasitic infections and its impacts are high among pregnant women in developing countries like Ethiopia. Therefore, this study aimed to assess the burden and associated factors of parasitic infections.

#### Methods

A facility-based cross-sectional study was conducted among 365 randomly selected women attending antenatal clinic at five selected health facilities. Data was collected by a pre-tested questionnaire and stool specimens were collected in clean plastic containers. A combination of direct microscopy and the formol-ether concentration technique was used as soon as the specimen collected. Data entry and analysed for descriptive and logistic regression models by SPSS v.23. The result declared as statistically significant at p < 0.05.

#### Results

The overall prevalence of IPI was 161 (45.9%). The most frequently identified parasites were Ascaris lumbricoides (27.9%), Schistosoma species (13.7%), Trichuris trichiura (5.1%), Hookworm (4.8%), and Taenia species. (1.4%). The IPIs were associated with women having no formal education [AOR=2.19, 95% CI: 1.05-4.57] or elementary school education [AOR=1.90, 95% CI: 1.11-3.27], as compared with high school educated and above. Monthly income of less than 1920 Ethiopian birr [AOR=2.06, 95% CI: 1.28-3.31], sharing a latrine with neighbours

[AOR=1.83, 95% CI: 1.14-2.93], using lake water for washing clothes [AOR=2.24, 95% CI: 1.34-3.74], habit of eating raw vegetables [AOR=2.26, 95% CI: 1.30-3.92] were associated with IPI as compared to their counterparts.

# Conclusions

Nearly half of the pregnant women were infected with IPs. The health facilities and clinicians need to focus on prevention of IPIs by early diagnosis, treating lake water before use, promote proper latrine utilization and provision of pertinent health education as part of ante-natal care service. It is important to minimize the impact of IPIs on pregnant women and their child.

Hailemariam, M., Alemayehu, T., Tadesse, B., Nigussie, N., Agegnehu, A., Habtemariam, T., Ali, M., Mitiku, E., & Azerefegne, E. (2021). Major bacterial isolate and antibiotic resistance from routine clinical samples in Southern Ethiopia. *Scientific Reports*, *11*(1). Scopus. https://doi.org/10.1038/s41598-021-99272-2

#### Abstract

Currently, antibiotic-resistant bacterial infections are a challenge for the health care system. Although physicians demand timely drug resistance data to guide empirical treatment, local data is rather scarce. Hence, this study performed a retrospective analysis of microbiological findings at the Hawassa public hospital. Secondary data were retrieved to assess the prevalence and level of drug resistance for the most common bacterial isolates from clinical samples processed at Hawassa University Comprehensive Specialized Hospital. Out of 1085 clinical samples processed in the microbiology laboratory, the prevalence of bacterial infection was 32.6%. Bacterial bloodstream infection was higher in children than in adults (OR, 4; 95% CI 1.8–14.6; p = 0.005). E. coli and K. pneumoniae were the commonest bacterial isolate both in children (36.8%, 26.3%) and in adults (33.3%, 26.7%) from the urine sample while, the leading bacteria identified from the CSF sample was P. aeruginosa, 37% in children and 43% in adult. In this study, all identified bacterial isolates were multi-drug resistant (MDR) ranging from 50 to 91%. The highest proportion of MDR was S. aureus 91.1 followed by K. pneumoniae 87.6%. Since the nationwide investigation of bacterial isolate, and drug resistance is rare in Ethiopia, a report from such type of local surveillance is highly useful to guide empirical therapy by providing awareness on the level resistance of isolates.

Oppel, S., Arkumarev, V., Bakari, S., Dobrev, V., Saravia-Mullin, V., Adefolu, S., Sözüer, L. A., Apeverga, P. T., Arslan, Ş., Barshep, Y., Bino, T., Bounas, A., Çetin, T., Dayyoub, M., Dobrev, D., Duro, K., El-Moghrabi, L., ElSafoury, H., Endris, A., ... Nikolov, S. C. (2021). Major threats to a migratory raptor vary geographically along the eastern Mediterranean flyway. *Biological Conservation*, 262. Scopus. https://doi.org/10.1016/j.biocon.2021.109277

#### Abstract

The Convention of Migratory Species aims to protect migratory animals throughout their range, but efficient mitigation of threats facing migratory birds is hindered by poor knowledge about the magnitude and geographic range of threats. We used an expert assessment to prioritise which threats to mitigate in 13 countries along the eastern Mediterranean flyway to protect globally threatened Egyptian Vultures Neophron percnopterus. We informed this assessment by satellite tracking 71 birds to quantify where and how mortalities occurred, surveying 4216 km of powerlines to detect carcasses, conducting 910 interviews to quantify poison use, and by surveying markets and hunters to assess direct persecution. Mortality of 50 birds occurred in Europe and the Mediterranean Sea (44%), the Middle East (18%), and Africa (38%), and mortality causes varied geographically. Inadvertent poisoning resulting from rural stakeholders targeting predators occurred along most of the flyway. On the breeding grounds in eastern Europe and in Saudi-Arabia, poisoning and collision and electrocution are the priority threats to mitigate. Electrocution on small and poorly designed electricity pylons was the priority threat in Turkey, Jordan, Egypt and Ethiopia. Direct persecution for belief-based use of vulture products was the priority threat in Nigeria and Niger, while other illegal killing was the priority threat in Lebanon and Syria. Our work cannot quantify which threat has the greatest demographic impact on Egyptian Vultures. Nonetheless, because all threats we assessed are relevant for many other migratory birds, our assessment highlights the priority threats that range states need to address to protect migratory birds.
### Wubshet, M. L., & Chala, A. (2021). Management of faba bean chocolate spot (Botrytis fabae) through varieties and fungicide application frequencies in Southern Tigray, Ethiopia. *Archives of Phytopathology and Plant Protection*, 54(19–20), 2233–2246. Scopus. https://doi.org/10.1080/03235408.2021.1925516 Abstract

Chocolate spot caused by Botrytis fabae is one of the major biotic constraints of faba bean production in the highlands of Ethiopia. Therefore, the current work was designed to evaluate the effect of varieties and fungicide spray frequencies on disease development and crop performance. Field experiments involving four faba bean varieties and four fungicide (Mancozeb 80% WP) spray frequencies (including control/unsprayed) were carried out at two locations. Disease severity was highest on the local variety and lowest on variety Walki regardless of the location. Besides, chocolate spot was the most severe on unsprayed plots both at Atsela and Ayba. On the other hand, three times mancozeb 80% WP at 2.5 kg ha-1 application resulted in the lowest AUDPC i.e., 1023%-days at Atsela and 1107%-days at Ayba. The disease resulted in grain yield loss of up to 34.9, 26.9 and 15.28% on unsprayed, once sprayed and twice sprayed plots, respectively. The highest cost benefit ratio (1:10.8) was obtained from three times fungicide application followed by two times (1:8.93) and once (1:7.08) application frequencies. The present findings ascertain the importance of chocolate spot in the region. Walki variety and three times Mancozeb 80% WP application appeared to be the best option for the management of chocolate spot in the region. However, current results need to be verified in multi-location and multi-season trials to come up with conclusive recommendation.

Bhattacharjee, N. V., Schaeffer, L. E., Hay, S. I., Lu, D., Schipp, M. F., Lazzar-Atwood, A., Donkers, K. M., Abady, G. G., Abd-Allah, F., Abdelalim, A., Abebo, Z. H., Abejie, A. N., Abosetugn, A. E., Abreu, L. G., Abrigo, M. R. M., Abu-Gharbieh, E., Abushouk, A. I., Adamu, A. L., Adedeji, I. A., ... Hay, S. I. (2021). Mapping inequalities in exclusive breastfeeding in low- and middle-income countries, 2000–2018. *Nature Human Behaviour*, 5(8), 1027–1045. Scopus. https://doi.org/10.1038/s41562-021-01108-6

#### Abstract

Exclusive breastfeeding (EBF)—giving infants only breast-milk for the first 6 months of life—is a component of optimal breastfeeding practices effective in preventing child morbidity and mortality. EBF practices are known to vary by population and comparable subnational estimates of prevalence and progress across low- and middle-income countries (LMICs) are required for planning policy and interventions. Here we present a geospatial analysis of EBF prevalence estimates from 2000 to 2018 across 94 LMICs mapped to policy-relevant administrative units (for example, districts), quantify subnational inequalities and their changes over time, and estimate probabilities of meeting the World Health Organization's Global Nutrition Target (WHO GNT) of  $\geq$ 70% EBF prevalence by 2030. While six LMICs are projected to meet the WHO GNT of  $\geq$ 70% EBF prevalence at a national scale, only three are predicted to meet the target in all their districtlevel units by 2030.

Sbarra, A. N., Rolfe, S., Nguyen, J. Q., Earl, L., Galles, N. C., Marks, A., Abbas, K. M., Abbasi-Kangevari, M., Abbastabar, H., Abd-Allah, F., Abdelalim, A., Abdollahi, M., Abegaz, K. H., Abiy, H. A. A., Abolhassani, H., Abreu, L. G., Abrigo, M. R. M., Abushouk, A. I., Accrombessi, M. M. K., ... Mosser, J. F. (2021). Mapping routine measles vaccination in low- and middle-income countries. *Nature*, *589*(7842), 415–419. Scopus. https://doi.org/10.1038/s41586-020-03043-4

#### Abstract

The safe, highly effective measles vaccine has been recommended globally since 1974, yet in 2017 there were more than 17 million cases of measles and 83,400 deaths in children under 5 years old, and more than 99% of both occurred in low- and middle-income countries (LMICs)1-4. Globally comparable, annual, local estimates of routine first-dose measles-containing vaccine (MCV1) coverage are critical for understanding geographically precise immunity patterns, progress towards the targets of the Global Vaccine Action Plan (GVAP), and high-risk areas amid disruptions to vaccination programmes caused by coronavirus disease 2019 (COVID-19)5–8. Here we generated annual estimates of routine childhood MCV1 coverage at  $5 \times 5$ -km2 pixel and second administrative levels from 2000 to 2019 in 101 LMICs, quantified geographical inequality and assessed vaccination status by geographical remoteness. After widespread MCV1 gains from 2000 to 2010, coverage regressed in more than half of the districts between 2010 and 2019, leaving many LMICs far from the GVAP goal of 80% coverage in all districts by 2019. MCV1 coverage was lower in rural than in urban locations, although a larger proportion of unvaccinated children overall lived in urban locations; strategies to provide essential vaccination services should address both geographical contexts. These results provide a tool for decision-makers to strengthen routine MCV1 immunization programmes and provide equitable disease protection for all children.

Cork, M. A., Henry, N. J., Watson, S., Croneberger, A. J., Baumann, M., Letourneau, I. D., Yang, M., Serfes, A. L., Abbas, J., Abbasi, N., Abbastabar, H., Abreu, L. G., Abu-Gharbieh, E., Achappa, B., Adabi, M., Adal, T. G., Adegbosin, A. E., Adekanmbi, V., Adetokunboh, O. O., ... Dwyer-Lindgren, L. (2021). Mapping subnational HIV mortality in six Latin American countries with incomplete vital registration systems. *BMC Medicine*, *19*(1). Scopus. https://doi.org/10.1186/s12916-020-01876-4

#### Abstract

#### Background

Human immunodeficiency virus (HIV) remains a public health priority in Latin America. While the burden of HIV is historically concentrated in urban areas and high-risk groups, subnational estimates that cover multiple countries and years are missing. This paucity is partially due to incomplete vital registration (VR) systems and statistical challenges related to estimating mortality rates in areas with low numbers of HIV deaths. In this analysis, we address this gap and provide novel estimates of the HIV mortality rate and the number of HIV deaths by age group, sex, and municipality in Brazil, Colombia, Costa Rica, Ecuador, Guatemala, and Mexico.

#### Methods

We performed an ecological study using VR data ranging from 2000 to 2017, dependent on individual country data availability. We modeled HIV mortality using a Bayesian spatially explicit mixed-effects regression model that incorporates prior information on VR completeness. We calibrated our results to the Global Burden of Disease Study 2017.

#### Results

All countries displayed over a 40-fold difference in HIV mortality between municipalities with the highest and lowest age-standardized HIV mortality rate in the last year of study for men, and over a 20-fold difference for women. Despite decreases in national HIV mortality in all countries— apart from Ecuador—across the period of study, we found broad variation in relative changes in HIV mortality at the municipality level and increasing relative inequality over time in all countries. In all six countries included in this analysis, 50% or more HIV deaths were concentrated in fewer than 10% of municipalities in the latest year of study. In addition, national age patterns reflected shifts in mortality to older age groups—the median age group among decedents ranged from 30 to 45 years of age at the municipality level in Brazil, Colombia, and Mexico in 2017.

#### Conclusions

Our subnational estimates of HIV mortality revealed significant spatial variation and diverging local trends in HIV mortality over time and by age. This analysis provides a framework for incorporating data and uncertainty from incomplete VR systems and can help guide more geographically precise public health intervention to support HIV-related care and reduce HIV-related deaths.

Gebre, G. G., Isoda, H., Amekawa, Y., Rahut, D. B., Nomura, H., & Watanabe, T. (2021b). Marketing Efficiency among Gender-Based Decision-Making Farm Households in Southern Ethiopia. *Journal of International Food and Agribusiness Marketing*. Scopus. https://doi.org/10.1080/08974438.2021.1911906

#### Abstract

This study examines the effect of gender on marketing efficiency among maize producing households using data collected in the Dawuro zone, southern Ethiopia. Results indicate that the amount of maize assigned to the first ranked (most efficient) channel for male, female and joint decision-making households is significantly larger than that of the second, third, and fourth ranked channels, respectively. Significant results vary across gender categories at the same stage of marketing channel. Female decision-making households receive a lower producer price, as well as cover higher marketing costs and margins of middlemen, as compared to male and joint decision-makers at the same stage of the marketing channel. This study also found a limited financial ability for local institutions to establish maize storages in the study area. There is a need for an integrated agricultural marketing information system that would help female decision-making maize producers to better engage in available market opportunities.

Mebratie, M. A., & Dawed, M. Y. (2021). Mathematical model analysis of crime dynamics incorporating media coverage and police force. *Journal of Mathematical and Computational Science*, *11*(1), 125–148. Scopus. https://doi.org/10.28919/jmcs/5062

#### Abstract

In this paper, a mathematical model is proposed to recognize the dynamics of crime. Unlike some of other previous model, we have taken into account the impact of media coverage, police force and moral/religious activity on crime. Some fundamental properties of the model including existence and positivity as well as bound-edness of the solutions of the model are investigated. The model exhibits two equilibria: the crime-free and the persistent equilibrium points. We sufficiently analyze asymptotic behavior of the solutions which depends on the basic reproduction number. Numerical simulation is carried out using Ode45 of Matlab, sensitivity analysis of the basic reproduction number is also constructed.

Galles, N. C., Liu, P. Y., Updike, R. L., Fullman, N., Nguyen, J., Rolfe, S., Sbarra, A. N., Schipp, M. F., Marks, A., Abady, G. G., Abbas, K. M., Abbasi, S. W., Abbastabar, H., Abd-Allah, F., Abdoli, A., Abolhassani, H., Abosetugn, A. E., Adabi, M., Adamu, A. A., ... Yuce, D. (2021). Measuring routine childhood vaccination coverage in 204 countries and territories, 1980–2019: A systematic analysis for the Global Burden of Disease Study 2020, Release 1. *The Lancet*, *398*(10299), 503–521. Scopus. https://doi.org/10.1016/S0140-6736(21)00984-3

#### Abstract

#### Background

Measuring routine childhood vaccination is crucial to inform global vaccine policies and programme implementation, and to track progress towards targets set by the Global Vaccine Action Plan (GVAP) and Immunization Agenda 2030. Robust estimates of routine vaccine coverage are needed to identify past successes and persistent vulnerabilities. Drawing from the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2020, Release 1, we did a systematic analysis of global, regional, and national vaccine coverage trends using a statistical framework, by vaccine and over time.

#### Methods

For this analysis we collated 55 326 country-specific, cohort-specific, year-specific, vaccinespecific, and dose-specific observations of routine childhood vaccination coverage between 1980 and 2019. Using spatiotemporal Gaussian process regression, we produced location-specific and year-specific estimates of 11 routine childhood vaccine coverage indicators for 204 countries and territories from 1980 to 2019, adjusting for biases in country-reported data and reflecting reported stockouts and supply disruptions. We analysed global and regional trends in coverage and numbers of zero-dose children (defined as those who never received a diphtheria-tetanus-pertussis [DTP] vaccine dose), progress towards GVAP targets, and the relationship between vaccine coverage and sociodemographic development.

#### Findings

By 2019, global coverage of third-dose DTP (DTP3; 81.6% [95% uncertainty interval 80.4-82.7]) more than doubled from levels estimated in 1980 (39.9% [37.5-42.1]), as did global coverage of the first-dose measles-containing vaccine (MCV1; from 38.5% [35.4-41.3] in 1980 to 83.6% [82.3-84.8] in 2019). Third-dose polio vaccine (Pol3) coverage also increased, from 42.6% (41.4-44.1) in 1980 to 79.8% (78.4-81.1) in 2019, and global coverage of newer vaccines increased rapidly between 2000 and 2019. The global number of zero-dose children fell by nearly 75% between 1980 and 2019, from 56.8 million (52.6-60.9) to 14.5 million (13.4-15.9). However, over the past decade, global vaccine coverage broadly plateaued; 94 countries and territories recorded decreasing DTP3 coverage since 2010. Only 11 countries and territories were estimated to have reached the national GVAP target of at least 90% coverage for all assessed vaccines in 2019.

#### Interpretation

After achieving large gains in childhood vaccine coverage worldwide, in much of the world this progress was stalled or reversed from 2010 to 2019. These findings underscore the importance of revisiting routine immunisation strategies and programmatic approaches, recentring service delivery around equity and underserved populations. Strengthening vaccine data and monitoring systems is crucial to these pursuits, now and through to 2030, to ensure that all children have access to, and can benefit from, lifesaving vaccines. Funding: Bill & Melinda Gates Foundation.

# Feyisa, M., Kassahun, A., & Giday, M. (2021). Medicinal Plants Used in EthnoveterinaryPractices in Adea Berga District, Oromia Region of Ethiopia. Evidence-BasedComplementaryandAlternativeMedicine,2021.Scopus.https://doi.org/10.1155/2021/5641479

#### Abstract

In Ethiopia, locally available materials, mainly medicinal plants, are commonly utilized to manage livestock diseases. However, this practice is currently being threatened by several factors including

loss of traditional knowledge and depletion of plant resources. This calls for an urgent need to document the ethnoveterinary knowledge in the country and conserve the associated medicinal plants. The purpose of this study was, therefore, to document traditional knowledge on use of medicinal plants in the Adea Berga district, Oromia region of Ethiopia, to manage livestock ailments. Ethnobotanical data were collected largely through semistructured interviews conducted with purposively selected traditional healers of the district. The study identified 59 medicinal plants used in ethnoveterinary practices in the district. The great majority (90.4%) of the medicinal plants were used in fresh forms, which were mainly administered orally. The majority (65.4%) of the medicinal plants were gathered from the wild. Data revealed that yoke sore (wound) had the highest informant consensus factor (ICF) value (1.00), followed by leech infestation (0.92) and endoparasite infections (0.90). The highest fidelity level (FL) (100%) and rank order priority (ROP) (100%) values were obtained for the plants Nicotiana tabacum, Malva parviflora, and Calpurnia aurea that were used to treat leech infestation, retained placenta, and snake poisoning, respectively. Priority for further pharmacological and phytochemical investigations needs to be given to the aforementioned three plants with the highest FL and ROP values as such values may indicate their higher potency against the respective ailments.

Olkeba, B. K., Goethals, P. L. M., Boets, P., Duchateau, L., Degefa, T., Eba, K., Yewhalaw, D., & Mereta, S. T. (2021). Mesocosm experiments to quantify predation of mosquito larvae by aquatic predators to determine potential of ecological control of malaria vectors in ethiopia. *International Journal of Environmental Research and Public Health*, *18*(13). Scopus. https://doi.org/10.3390/ijerph18136904

#### Abstract

Malaria parasites are transmitted to humans by infectious female Anopheles mosquitoes. Chemical-insecticide-based mosquito control has been successful in reducing the burden of malaria. However, the emergence of insecticide resistance in malaria vectors and concerns about the effect of the chemicals on the environment, human health, and non-target organisms present a need for new or alternative vector control intervention tools. Biocontrol methods using aquatic invertebrate predators have emerged as a potential alternative and additional tool to control mosquito populations. Ecological control specifically makes use of species insights for improving the physical habitat conditions of competitors and predators of vectors. A first step towards this is to gain knowledge on the predation potential of several typically present macroinvertebrates. Hence, this study aimed at (1) examining the influence of the predation of hemipterans on the number of emerging adult mosquitoes and (2) detecting Anopheles mosquito DNA in the gut of those predators. The prey and predators were collected from a range of water bodies located in the Gilgel Gibe watershed, southwest Ethiopia. A semi-field study was carried out using mesocosms which were constructed using plastic containers mimicking the natural aquatic habitat of immature Anopheles mosquitoes. Adult mosquitoes that emerged from the mesocosms were collected using a mechanical aspirator. At the end of the experiment, predators were withdrawn from the mesocosms and identified to genus level. Polymerase Chain Reaction (PCR) was employed to identify sibling species of Anopheles gambiae s.l. and to detect Anopheles mosquito DNA in the gut of the predators. Data were analysed using R software. Giant water bugs (belostomatids) were the most aggressive predators of Anopheles larvae, followed by backswimmers (notonectids) and water boatmen (corixids). All female Anopheles gambiae s.l. emerged from the mesocosms were identified as Anopheles arabiensis. Anopheles arabiensis DNA was detected in the gut content of hemipteran specimens analysed from the three families. The number of the adult mosquitoes emerging from the mesocosms was affected by the presence of predators. The findings of this study provide evidence of the potential use of aquatic macroinvertebrate predators as biocontrol agents against immature Anopheles mosquitoes and their potential to be considered as a component of integrated vector management for insecticide resistance and the combined restoration of aquatic ecosystems via smart ecological engineering.

## Haile, B., Tesfaye, B., & Olango, T. M. (2021). Methods for vegetative propagation of wild enset (Ensete ventricosum (Welw.) Cheesman) that make genotype conservation possible. *Heliyon*, 7(11). Scopus. https://doi.org/10.1016/j.heliyon.2021.e08416

#### Abstract

The declining trends in crop wild relative genetic resources in many crop centers of origins including Ethiopia require short and long-term conservation strategies. Enset (Ensete ventricosum) is arguably the most important cultivated food security crop of Ethiopia with dwindling wild stocks. The cultivated enset is propagated clonally through adventitious bud sprouting from the corm after the distraction of the apical meristem. Shoot regeneration in the cultivated enset has

been induced by humans and has not been observed to occur naturally. The technique of shoot induction has not been extended to the wild enset. To determine whether the capacity for shoot regeneration existed in wild enset and optimize the technique, a series of experiments were conducted. These involved: (i) sucker production from corms of wild enset with and without apical meristem removal; (ii) sprouting capacity of corms ranging 22-49 cm diameter, with removed apical meristem; and (iii) a factorial experiment involving two populations of wild enset (from Shebena and Getiba localities in Sheka zone), two ways of preparing or cutting the corms: tero and tubo, i.e. cutting the pseudostem at the corm junction and cutting it at 25-30 cm height, respectively, and three extents of parting the corm (whole, half, and quarter) using corms with a diameter of  $45 \pm 2.9$  cm. The experiments revealed that wild enset can be successfully propagated vegetatively in the same way as the cultivated enset. It also revealed that the regeneration process involved callus formation and adventurous bud proliferation from corms only after the apical meristem was removed. Corms of different sizes varied in their capacity for regeneration significantly with a linear increase in regeneration frequency with corm size. With a one cm increase in corm diameter, regeneration frequency increased by 3.138 %. The two populations of wild enset showed non-significant differences in regeneration capacity; however, the achieved regeneration was generally analogous to that observed among cultivated enset clones: whole corms resulted in a longer time to emergence and fewer sucker per corm than split corms. Specifically, halved corms emerged significantly (p < 0.05) earlier (71 ± 9 and 75 ± 7 days, for Shebena and Getiba populations, respectively) than whole corms (120 days). Regeneration frequency was higher (75–100%) for split than for whole corms (33–56%). The highest rate of suckering (94  $\pm$ 14 per corm) was achieved from quarter corms prepared by cutting the pseudo-stem at the junction. In conclusion, the adventitious bud propagation technique developed by farmers to propagate the cultivated enset can successfully be used for the clonal regeneration of wild enset. We recommend the adoption of this shoot induction to conserve and maintain the rapidly eroding wild enset genetic resources in Ethiopia. In addition, wild enset plants with promising characteristics may be fixed using the method to enrich the gene pool of the cultivated enset.

#### Desta, R., Tesfaye, D., & Tóth, J. (2021). Microscopic Traffic Characterization of Light Rail Transit Systems at Level Crossings. *Advances in Civil Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/5574848

#### Abstract

The movement of the light rail vehicles (LRVs) is highly interrupted at level crossings during peak hour times, especially when the intersections are not regulated by a coordinated signal system. Traffic modelling ensures better understanding and interpretation of complex traffic interactions. This study is aimed at modelling light rail transit (LRT) system operational characteristics at level crossings in Addis Ababa City using VISSIM software. The studied scenarios at Sebategna (All Way Stop Controlled, AWSC) and CMC (Roundabout) level crossings are the baseline without LRT scenario, the actual scenario with collected LRV headways, twice arrival frequency scenario, signalized actual LRV arrival, and signalized twice actual LRV arrival. The relative comparisons among the tested scenarios depicted that significant travel time savings can be achieved in some approaches if more green time is offered to nonconflicting phases during a light rail crossing. Overall, the average additional delays at level crossings increase from the base scenario with increasing light rail crossing frequencies, and delay at the level crossing is the second important variable that contributes to the variability of train travel time at peak hours. If it is a must for an intersection to have a rail road to pass through the median, different options should be verified based on the trade-off between the operational cost of the level crossing and the cost incurred if it is grade separated.

Birie, B., Kassa, A., Kebede, E., & Terefe, B. (2021). Minimum acceptable diet practice and its associated factors among children aged 6–23 months in rural communities of Goncha district, north West Ethiopia. *BMC Nutrition*, 7(1). Scopus. https://doi.org/10.1186/s40795-021-00444-0

Abstract

#### Background

After the first 6 months breast milk is no longer sufficient to meet the nutritional needs of the infant. Therefore, complementary foods should be added to the child's diet. Feeding children with

a diversified diet is practiced improperly in developing countries including Ethiopia particularly in the rural community of the Amhara region. However, limited information was documented on the rural communities and no data were available specifically in the study area to show the exact picture of child feeding practices. So, this study was planned to assess minimum acceptable diet practice and its associated factors among children aged 6–23 months in the rural community of Goncha district, Amhara region, Ethiopia.

#### Methods

Community-based cross-sectional study was employed to determine minimum acceptable diet practice and its associated factors among children aged 6–23 months at rural communities of Goncha district, East Gojjam zone, Amhara region, Ethiopia. A multi-stage sampling technique was used to select study subjects, and an interview administered structured questionnaire was used to collect the data. Data were entered by Epi Data version 4.0.2 and exported to SPSS 20 for analysis. Bivariate and multivariable logistic regression analysis was used to see the association. Then, P-value < 0.05 with 95% CI on multivariable logistic regression analysis were used to identify the predictor of the outcome variable.

#### Results

A total of 430 mothers who have children aged 6–23 months were included in the analysis with a 98% of response rate. About 12.6% of children aged 6–23 months received the recommended minimum acceptable diet. Children whose mothers who had formal education [AOR = 2.7, 95%CI (1.133, 6.231)], institutional delivery [AOR = 4.5, 95%CI (1.986, 10.362)], media exposure [AOR = 2.6, 95%CI (1.303, 5.291)] and higher household wealth index [AOR = 2.5, 95%CI (1.139, 5.90)] were significantly associated with minimum acceptable diet.

#### Conclusion

The practice of minimum acceptable diet in the study area was inadequate and very low according to the national recommendation. So, strengthening institutional delivery, improving the wealth of the community and exposure to media, and finally empowering women's' for education is recommended.

Ayano, G., Demelash, S., yohannes, Z., Haile, K., Tulu, M., Assefa, D., Tesfaye, A., Haile, K., Solomon, M., Chaka, A., & Tsegay, L. (2021). Misdiagnosis, detection rate, and associated factors of severe psychiatric disorders in specialized psychiatry centers in Ethiopia. *Annals of General Psychiatry*, 20(1). Scopus. https://doi.org/10.1186/s12991-021-00333-7

#### Abstract

#### Background

There are limited studies on the prevalence of misdiagnosis as well as detection rates of severe psychiatric disorders in specialized and non-specialized healthcare settings. To the best of our knowledge, this is the first study to determine the prevalence of misdiagnosis and detection rates of severe psychiatric disorders including schizophrenia, schizoaffective, bipolar, and depressive disorders in a specialized psychiatric setting.

#### Method

In this cross-sectional study, a random sample of 309 patients with severe psychiatric disorders was selected by systematic sampling technique. Severe psychiatric disorders were assessed using the Structured Clinical Interview for DSM-IV (SCID). The potential determinates of misdiagnosis were explored using univariable and multivariable logistic regression models, adjusting for the potential confounding factors.

#### Resuls

This study revealed that more than a third of patients with severe psychiatric disorders were misdiagnosed (39.16%). The commonly misdiagnosed disorder was found to be a schizoaffective disorder (75%) followed by major depressive disorder (54.72%), schizophrenia (23.71%), and bipolar disorder (17.78%). Among the patients detected with the interview by SCID criteria, the highest level of the correct diagnosis was recorded in the medical record for schizophrenia (76.29%) followed by bipolar (72.22%), depressive (42.40%), and schizoaffective (25%) disorders with detection rate (sensitivity) of 0.76 (95% CI 0.69–0.84), 0.42 (95% CI 0.32–0.53), 0.72 (95% CI 0.60–0.84), and 0.25 (95% CI 0.09–0.41), respectively for schizophrenia, depressive, bipolar, and schizoaffective disorders. Patients with bipolar disorder were more likely to be misdiagnosed as having schizophrenia (60%), whereas schizophrenic patients with depressive disorders were more likely to be misdiagnosed as having bipolar disorder (56.25%) and patients with depressive disorders were more likely to be misdiagnosed as having schizophrenia (54.72%). Having a diagnosis of

schizoaffective and depressive disorders, as well as suicidal ideation, was found to be significant predictors of misdiagnosis.

#### Conclusion

This study showed that roughly four out of ten patients with severe psychiatric disorders had been misdiagnosed in a specialized psychiatric setting in Ethiopia. The highest rate of misdiagnosis was observed for schizoaffective disorder (3 out of 4), followed by major depressive disorder (1 out of 2), schizophrenia (1 out of 4), and bipolar disorders (1 in 5). The detection rates were highest for schizophrenia, followed by bipolar, depressive, and schizoaffective disorders. Having a diagnosis of schizoaffective and depressive disorders as well as suicidal ideation was found to be significant predictors of misdiagnosis.

Roy, P.-K., Qamar, A.-Y., Tanga, B.-M., Bang, S., Seong, G., Fang, X., Kim, G., Edirisinghe, S.-L., De Zoysa, M., Kang, D.-H., Saadeldin, I. M., & Cho, J. (2021). Modified spirulina maxima pectin nanoparticles improve the developmental competence of in vitro matured porcine oocytes. *Animals*, *11*(9). Scopus. https://doi.org/10.3390/ani11092483

#### Abstract

Molecular approaches have been used to determine metabolic substrates involved in the early embryonic processes to provide adequate culture conditions. To investigate the effect of modified Spirulina maxima pectin nanoparticles (MSmPNPs) on oocyte developmental competence, cumulus–oocyte complexes (COCs) retrieved from pig slaughterhouse ovaries were subjected to various concentrations of MSmPNPs (0, 2.5, 5.0, and 10 µg/mL) during in vitro maturation (IVM). In comparison to the control, MSmPNPs-5.0, and MSmPNPs-10 groups, oocytes treated with 2.5 µg/mL MSmPNPs had significantly increased glutathione (GSH) levels and lower levels of reactive oxygen species (ROS). Following parthenogenetic activation, the MSmPNPs-2.5 group had a considerably higher maturation and cleavage rates, blastocyst development, total cell number, and ratio of inner cell mass/trophectoderm (ICM:TE) cells, when compared with those in the control and all other treated groups. Furthermore, similar findings were reported for the developmental competence of somatic cell nuclear transfer (SCNT)-derived embryos. Additionally, the relative quantification of POU5F1, DPPA2, and NDP52 mRNA transcript levels were significantly higher in the MSmPNPs-2.5 group than in the control and other treated groups.

Taken together, the current findings suggest that MSmPNP treatment alleviates oxidative stress and enhances the developmental competence of porcine in vitro matured oocytes after parthenogenetic activation and SCNT.

Merid, Y., Hailu, E., Habtamu, G., Tilahun, M., Abebe, M., Hailu, M., Hailu, T., Datiko, D. G., Woldeamanuel, Y., & Aseffa, A. (2021). Molecular Epidemiology of Mycobacterium tuberculosis strains isolated from pulmonary tuberculosis patients in south Ethiopia. *Journal of Infection in Developing Countries*, 15(9), 1299–1307. Scopus. https://doi.org/10.3855/jidc.14742

#### Abstract

#### Introduction

Understanding the epidemiology of tuberculosis is limited by lack of genotyping data. We sought to characterize the drug susceptibility testing patterns and genetic diversity of M. tuberculosis isolates in southern Ethiopia.

#### Methodology

A cross-sectional study was conducted among newly diagnosed sputum smear positive patients with tuberculosis visiting nine health facilities in southern Ethiopia from June 2015 to May 2016. Three consecutive sputum samples (spot-morning-spot) per patient were examined using acid-fast bacilli smear microscopy with all smear positive specimens having acid-fast bacilli cultures performed. M. tuberculosis isolates had drug susceptibility testing performed using indirect proportion method and were genotyped with RD9 deletion analysis and spoligotyping. Mapping of strain was made using geographic information system.

#### Results

Among 250 newly diagnosed patients with tuberculosis, 4% were HIV co-infected. All 230 isolates tested were M. tuberculosis strains belonging to three lineages: Euro-American, 187 (81%), East-African-Indian, 31 (14%), and Lineage 7 (Ethiopian lineage), 8 (4%); categorized into 63 different spoligotype patterns, of which 85% fell into 28 clusters. M. tuberculosis strains were clustered by geographic localities. The dominant spoligotypes were SIT149 (21%) and SIT53 (19%). Drug susceptibility testing found that 14% of isolates tested were resistant to > 1 first line anti-

tuberculosis drugs and 11% to INH. SIT 149 was dominant among drug resistant isolates. Conclusions

The study revealed several clusters and drug resistant strains of M. tuberculosis in the study area, suggesting recent transmission including of drug resistant tuberculosis. Wider monitoring of drug susceptibility testing and geospatial analysis of transmission trends is required to control tuberculosis in southern Ethiopia.

## Mordal, E., Hanssen, I., Kassa, A., & Vatne, S. (2021). Mothers' Experiences and Perceptions of Facility-based Delivery Care in Rural Ethiopia. *Health Services Insights*, 14. Scopus. https://doi.org/10.1177/11786329211017684

#### Abstract

In Ethiopia, delivery wards are a part of primary healthcare services. However, although the maternal mortality rate is very high, approximately 50% of mothers use skilled birth attendants. This study focused on how women in a rural southern district of Ethiopia experience maternity care offered at the local delivery wards. In this qualitative, exploratory study, 19 women who had given birth in a healthcare facility were interviewed in 2019. Individual in-depth interviews were supplemented with observations conducted at 2 different delivery wards in the same district in 2020. Two main themes emerged from the thematic content analysis: increased awareness and safety were the primary reasons for giving birth at a healthcare facility, and traditions and norms affected women's birth experiences in public maternity wards. The main shortcomings were a shortage of medicine, ambulance not arriving in time, and lack of care at night. For some women, being assisted by a male midwife could be challenging, and the inability to afford necessary medicine made adequate treatment inaccessible. Providing continuous information gave the women a certain feeling of control. Strong family involvement indicated that collectivistic expectations were key to rural delivery wards. The healthcare system must be structured to meet women's needs. Moreover, managers and midwives should ensure that birthing women receive high-quality, safe, timely, and respectful care.

McGuire, M. K., Randall, A. Z., Seppo, A. E., Järvinen, K. M., Meehan, C. L., Gindola, D., Williams, J. E., Sellen, D. W., Kamau-Mbuthia, E. W., Kamundia, E. W., Mbugua, S., Moore, S. E., Prentice, A. M., Foster, J. A., Otoo, G. E., Rodríguez, J. M., Pareja, R. G., Bode, L., McGuire, M. A., & Campo, J. J. (2021). Multipathogen Analysis of IgA and IgG Antigen Specificity for Selected Pathogens in Milk Produced by Women From Diverse Geographical Regions: The INSPIRE Study. *Frontiers in Immunology*, *11*. Scopus. https://doi.org/10.3389/fimmu.2020.614372

#### Abstract

Breastfeeding provides defense against infectious disease during early life. The mechanisms underlying this protection are complex but likely include the vast array of immune cells and components, such as immunoglobulins, in milk. Simply characterizing the concentrations of these bioactives, however, provides only limited information regarding their potential relationships with disease risk in the recipient infant. Rather, understanding pathogen and antigen specificity profiles of milk-borne immunoglobulins might lead to a more complete understanding of how maternal immunity impacts infant health and wellbeing. Milk produced by women living in 11 geographically dispersed populations was applied to a protein microarray containing antigens from 16 pathogens, including diarrheagenic E. coli, Shigella spp., Salmonella enterica serovar Typhi, Staphylococcus aureus, Streptococcus pneumoniae, Mycobacterium tuberculosis and other pathogens of global health concern, and specific IgA and IgG binding was measured. Our analysis identified novel disease-specific antigen responses and suggests that some IgA and IgG responses vary substantially within and among populations. Patterns of antibody reactivity analyzed by principal component analysis and differential reactivity analysis were associated with either lowerto-middle-income countries (LMICs) or high-income countries (HICs). Antibody levels were generally higher in LMICs than HICs, particularly for Shigella and diarrheagenic E. coli antigens, although sets of S. aureus, S. pneumoniae, and some M. tuberculosis antigens were more reactive in HICs. Differential responses were typically specific to canonical immunodominant antigens, but a set of nondifferential but highly reactive antibodies were specific to antigens possibly universally recognized by antibodies in human milk. This approach provides a promising means to understand how breastfeeding and human milk protect (or do not protect) infants from environmentally relevant pathogens. Furthermore, this approach might lead to interventions to boost population-specific immunity in at-risk breastfeeding mothers and their infants.

## Teshome, F. B. (2021). Municipal solid waste management in Ethiopia; the gaps and ways for improvement. *Journal of Material Cycles and Waste Management*, 23(1), 18–31. Scopus. https://doi.org/10.1007/s10163-020-01118-y

#### Abstract

This study aimed at examining solid waste management systems in Ethiopia, identifying the gaps, and exploring ways for improvement. Expansive literature surveys of journal articles, official reports, state-issued pamphlets, critical review of laws and policies were used to elicit information. Case studies provided insight into challenges while investigations into the waste management system of countries with a better system were made to draw comparisons and pinpoint areas of improvement. The average waste generation (0.32 kg/capita/day) was found to be within the limit of waste generation for low-income countries: however, there is an annual increase in waste generation by 5%. The waste is dominated by organic biodegradables which accounted for 67.4%. Crude open dumping without pre-treatment and traditional open burning of wastes are common practices. only 5% of waste is recycled in an unsafe informal way. The current waste management system can be described by 3 I's (Irregular, inadequate, and inefficient) which denote sporadic and inconsistent collection, low coverage, technical frailties, and lack of enforcement of laws, respectively. Hence, implementing the new system proposed in this study should be a priority. Political will, institutional reform, finance, and most importantly change in behavior are necessary to ensure sustainable waste management.

## Kidanu, S., Azerefegne, F., & Mendesil, E. (2021). Natural insecticides for the control of urticating ant, Tetramorium aculeatum Mayr (Hymenoptera: Formicidae) in a coffee plantation of Southwestern Ethiopia. *Heliyon*, 7(3). Scopus. https://doi.org/10.1016/j.heliyon.2021.e06546

#### Abstract

Coffee, Coffea arabica L. is a vital crop in Ethiopia's social, cultural, and national economy. Despite its dominant role in the country, the crop is challenged by various insect pests, which reduce coffee yield and quality. The urticating ant or biting ant, Tetramorium aculeatum Mayr (Hymenoptera: Formicidae), is an important pest in coffee that affects farming activities in Southwestern Ethiopia. The objective of this study was to evaluate the efficacy of some natural insecticides for the control of biting ants. Nine insecticide treatments were evaluated both under ex-situ and in-situ conditions in CRD and RCBD designs, respectively. Under the ex-situ evaluation, all the insecticide treatments caused significantly higher mortality of biting ants and caused complete mortality within 24 h. Under field conditions, the insecticides showed significant variations in the percent of evacuated nests, and the number of newly constructed nests. In both efficacy tests of ex-situ and in-situ experiments, the mortality of biting ants and percent of evacuated nests in the coffee trees treated with oxymatrine and nimbicidine were found to be comparable and effective as the deltamethrin 2.5% EC. All the insecticide treatments significantly reduced the number of newly constructed nests compared to the control plot. On the other hand, deltamethrin 2.5% EC significantly decreased newly constructed nests after 30 days of application compared to the other insecticide treatments. Generally, the natural insecticides effectively minimized the biting ant infestation, but further studies are essential on the frequency of spray to use them for sustainable management approaches of biting ant in the coffee plantation.

## Tekola, A. F., Baye, G., Amaje, E., & Tefera, K. (2021). Neonatal near misses and associated factors among mother's who give a live neonate at Hawassa City governmental hospitals, 2019: A facility based cross-sectional study design. *BMC Pregnancy and Childbirth*, 21(1). Scopus. https://doi.org/10.1186/s12884-021-03601-2\_Conference

#### Abstract

This paper describes neural machine translation between orthographically and morphologically divergent languages. Amharic has a rich morphology; it uses the syllabic Ethiopic script. We used a new transliteration technique for Amharic to facilitate vocabulary sharing. To tackle the highly inflectional morphology and to make an open vocabulary translation, we used subwords. Furthermore, the research was conducted on low-data conditions. We used the transformer-based neural machine translation architecture by tuning the hyperparameters for low-data conditions. In the automatic evaluation of the strong baseline, word-based, and subword-based models trained on a public benchmark dataset, the best subword-based models outperform the baseline models by approximately six up to seven BLEU.

Riley, J., Calinescu, R., Paterson, C., Kudenko, D., Banks, A., Zin, M., Racharak, T., Le, N., Eid, S., & Espinosa, D. N. (2021). ICAART 2021-PROCEEDINGS OF THE 13TH INTERNATIONAL CONFERENCE ON AGENTS AND ARTIFICIAL INTELLIGENCE. *POWER*, 333(342), 0.

#### Background

Neonatal near miss is a neonate who nearly died but survived from a severe complication occurred during pregnancy, birth or within 0–28 days of extra-uterine life. However, there is no available data that quantifies the magnitude of neonatal near miss (NNM) in Ethiopia where there is high prevalence of neonatal mortality. Therefore, this study is designed to provide information about the magnitude and associated factors of neonatal near miss among women who give a live birth at Hawassa City Governmental hospitals, 2019.

#### Methods

A facility based cross-sectional study design was conducted on 604 mothers who gave live neonates at Adare General Hospital and Hawassa University Comprehensive and Specialized Hospital from May 9, 2019 to June 7, 2019. Face to face interviewer administered structured questionnaire with a supplementation of maternal and neonatal medical records with checklists were used to collect the data. Data were coded and entered in to Epi data version 3.1 and then exported to the Statistical Package for Social Science IBM version 25 for analysis. Descriptive statistics was run and the data were presented using frequency tables and figure. The bi-variable and multivariable logistic regression was used to identify the possible factors of neonatal near miss. Finally, Adjusted Odds Ratio and 95% Confidence Intervals were used to declare statisticall significance.

#### Result

Among all 604 selected live births an overall proportion of NNM cases, 202 (33.4%) (95% CI: 29.7–37.1%) was obtained at Hawassa City Government Hospitals. Respiratory distress 158 (94%) and infection or sepsis 138 (84%) were found to be the leading causes of NNM cases in our study. Governmental and non-governmental employed mother (AOR = 3.05, 95% CI: 1.46-6.44) and Cesarean Section delivery (AOR = 1.89, (95% CI: 1.25-2.83)) were positively significantly associated with neonatal near miss. Whereas, pregnancy induced Hypertension (AOR = 0.43, 95% CI: 0.27-0.69) was negatively associated with neonatal near miss.

#### Conclusion

This study revealed relatively high prevalence of NNM in the study areas. Employed women, pregnancy induced hypertension and cesarean section mode of delivery were found to be independent factors affecting the prevalence of NNM cases. Therefore, HUCSH and Adare general Hospitals should focus on proving quality antenatal care and prevention of occupational related problems among pregnant women.

Asfaw, Z. K., Tirsit, A., Barthélemy, E. J., Mesfin, E., Wondafrash, M., Yohannes, D., Ashagre, Y., Park, K., & Laeke, T. (2021). Neurosurgery in Ethiopia: A New Chapter and Future Prospects. *World Neurosurgery*, *152*, e175–e183. Scopus. https://doi.org/10.1016/j.wneu.2021.05.071

#### Abstract

#### Background

Inequitable access to surgical care is most conspicuous in low-income countries (LICs), such as Ethiopia, where infectious diseases, malnutrition, and other maladies consume the lion's share of the available health resources. The aim of this article was to provide an update on the current state of neurosurgery in Ethiopia and identify targets for future development of surgical capacity as a universal health coverage component in this East African nation.

#### Methods

Publicly available data included in this report were gathered from resources published by international organizations. A PubMed search was used for a preliminary bibliometric analysis of scholarly output of neurosurgeons in Ethiopia and other low-income countries. Statistical analysis was used to determine the correlation between the number of neurosurgeons and academic productivity.

#### Results

Neurosurgeon density has increased >20-fold from 0.0022 to 0.045 neurosurgeons per 100,000 population between 2006 and 2020. The increase in neurosurgeons was strongly correlated with an increase in total publications (P < 0.001) and the number of new publications per year (P = 0.003). Despite recent progress, the availability of neuroimaging equipment remains inadequate, with 38 computed tomography scanners and 11 magnetic resonance imaging machines for a

population of 112.07 million. The geographic distribution of neurosurgical facilities is limited to 12 urban centers.

#### Conclusions

Ethiopian neurosurgery exemplifies the profound effect of international partnerships for training local surgeons on progress in low-income countries toward improved neurosurgical capacity. Collaborations that focus on increasing the neurosurgical workforce should synchronize with efforts to enhance the availability of diagnostic and surgical equipment necessary for basic neurosurgical care.

Zena, A. G., Duff, A. I., Melesse, A., Wolff, J. A., Beldados, A., & Shackley, M. S. (2021). New dates for megalithic stele monuments of Gedeo, South Ethiopia. *Journal of African Archaeology*, *10*(2). Scopus. https://doi.org/10.1163/21915784-bja10006

#### Abstract

This paper reports the results of an archaeological survey and test excavation conducted in one of the ancient megalithic stele sites in south Ethiopia, Sakaro Sodo. The Sakaro Sodo stele site is situated in Gedeo zone, which is known to have the largest number and highest concentration of megalithic stele monuments in Africa, with an estimate of more than 10,000 stelae in sixty or more sites. Prior to our work, only one absolute date was available ( $850 \pm 40$  BP) (Joussaume 2012) from a stele site in the Gedeo zone, suggesting stele sites began to be constructed in the region approximately a millennium ago. We report here new AMS dates suggesting that stelae were being emplaced about 2000 BP, pushing the creation of these monuments back at least a millennium. Additionally, we report preliminary findings from characterizing the geochemical properties of obsidian artifacts recovered from stele sites, and stone used to make stelae. While compositional analysis of obsidian suggests long-distance movement of material from sources located in northern Kenya, petrographic microscopy and electron microprobe analyses show a strong connection of stelae to local geological tuff exposures/sources.

Tadesse Zula, A., Desta, D. T., & Willis, M. S. (2021). Nile tilapia (Oreochromis niloticus) fried in recycled palm oil: Implications for nutrition and health. *International Journal of Food Properties*, *24*(1), 806–817. Scopus. https://doi.org/10.1080/10942912.2021.1931304

#### Abstract

Fish constitutes a occasional food for the Sidama people of Hawassa, the capital city of Ethiopia's Sidama Region and the site of a large endorheic lake. Freshly-caught fish, especially Nile tilapia or koroso in Local name, are typically fried prior to consumption. Despite the sensory qualities, fried foods are not always advisable due to the impact of frying on the nutritional quality of food. This study was designed to assess the nutritional quality of Nile tilapia that had been fried in the same palm oil over six consecutive frying cycles. The raw fish were purchased from the Lake Hawassa fish market and fried at Hawassa University by simulating local preparation methods. A gas chromatography-mass spectrophotometer (GCMS) was used for the fatty acid profile analysis and a total of 22 fatty acids were elucidated. The nutritional quality indices of fatty acids was determined by calculating the recommended formula and JMP pro 13 was used for statistical analysis. The study results revealed that the tilapia fried in the oldest, most used oil, cycles 3-6, contained high amounts of saturated and trans fatty acids, as well as high atherogenic and thrombogenic indices; however, it was also lower in essential and cis fatty acids, the hypocholesterolemic/hypercholesterolemic ratio, the per-oxidizability index, and the nutritive value index. Conversely, fish prepared earlier (cycles 1-3) with fresher oil were higher in essential fatty acids and cis fatty acids, while the hypocholesterolemic/hypercholesterolemic ratio, the peroxidizability index, and the nutritive value index were also high. Fish fried in an earlier cycle were also low in saturated and trans-fatty acids, with a lower atherogenic index, and thrombogenic index. Therefore, it can be concluded that repeatedly using the same frying oil to prepare Nile tilapia contributed to the loss of nutritional value. Results suggest that palm oil should be limited to no more than three frying cycles to maximize nutritional intake in of fish consumption.

PÉREZ-CASTILLO, A. G., CHINCHILLA-SOTO, C., ELIZONDO-SALAZAR, J. A., BARBOZA, R., KIM, D.-G., MÜLLER, C., SANZ-COBENA, A., BORZOUEI, A., DAWAR, K., & ZAMAN, M. (2021). Nitrification inhibitor nitrapyrin does not affect yield-scaled nitrous oxide emissions in a tropical grassland. *Pedosphere*, *31*(2), 265–278. Scopus. https://doi.org/10.1016/S1002-0160(20)60070-4

#### Abstract

Urea is the most common nitrogen (N) fertilizer used in the tropics but it has the risk of high gaseous nitrogen (N) losses. Use of nitrification inhibitor has been suggested as a potential mitigation measure for gaseous N losses in N fertilizer-applied fields. In a field trial on a tropical Andosol pastureland in Costa Rica, gaseous emissions of ammonia (NH3) and nitrous oxide (N2O) and grass yield were quantified from plots treated with urea (U; 41.7 kg N ha-1 application-1) and urea plus the nitrification inhibitor nitrapyrin (U + NI; 41.7 kg N ha-1 application-1 and 350 g of nitrapyrin for each 100 kg of N applied) and control plots (without U and NI) over a six-month period (rainy season). Volatilization of NH3 (August to November) in U (7.4% ± 1.3% of N applied) and U + NI ( $8.1\% \pm 0.9\%$  of N applied) were not significantly different (P > 0.05). Emissions of N2O in U and U + NI from June to November were significantly different (P & lt; (0.05) only in October, when N2O emission in U + NI was higher than that in U. Yield and crude protein production of grass were significantly higher (P & lt; 0.05) in U and U + NI than in the control plots, but they were not significantly different between U and U + NI. There was no significant difference in yield-scaled N2O emission between U ( $0.31 \pm 0.10$  g N kg-1 dry matter) and U + NI (0.47  $\pm$  0.10 g N kg–1 dry matter). The results suggest that nitrapyrin is not a viable mitigation option for gaseous N losses under typical N fertilizer application practices of pasturelands at the study site.

Amanuel, F. K. (2021). Nuclear model prediction for production of medical 22Na, 51Cr, 60Co, 61Cu, 64Cu, 65Zn, 67, 68Ga, 88Y and 99Mo radionuclides: Comparison of experimental and theoretical data. *Applied Radiation and Isotopes*, 172. Scopus. https://doi.org/10.1016/j.apradiso.2021.109674

#### Abstract

Theoretical nuclear model predictions were carried out to calculate the production cross sections of medically important 22Na, 51Cr, 60Co, 61Cu, 64Cu, 65Zn, 67, 68Ga, 88Y and 99Mo radionuclides produced in the interaction of  $\alpha$ -projectile with 27Al, 51V, 59Co, 60Ni, 65Cu, 63Cu, 66Zn, 89Y and 96Zr targets respectively at energies  $\approx$ 10–65 MeV. The production cross sections were predicted using ALICE/ASH and EMPIRE 3.2 nuclear model codes. The predicted results are discussed and compared with the experimental data in the literature.

## Uge, B. U., Guo, Y., & Liu, Y. (2021). Numerical Analysis on the Load Sharing Performance of Long-Short CFG Pile Composite Foundation Subjected to Rotation of Adjacent Retaining Wall. *Advances in Civil Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/9923534

#### Abstract

The stress and displacement boundary conditions of excavation retaining structures affect the deformation mechanism and movement of the retained soil mass. The soil movement disturbs the load sharing performance and structural integrity of cement-fly ash-gravel (CFG) pile composite foundations existing in the vicinity, which merits considerable research work. This article presents results from 3D finite element analyses performed to study the influence of retaining wall rotation on the load sharing characteristics of adjacent CFG pile composite foundation comprising long and short piles. To verify the numerical model, a relatively large-scale 1 g physical model test was conducted. It is revealed that to arrive at a new static equilibrium during progression of wall rotation, the percentage load sharing ratios of the long and short piles change increasingly while the load proportion carried by the upper soil reduces remarkably. The percentage load sharing characteristics of CFG pile composite foundation having  $3 \times 3$  long and short piles placed at 3.0-15.0 m away from the wall, the location resulted in a reduction of soil bearing capacity

ranging between 1.4 and 7.5% of the total imposed load while the corresponding increase in the % load borne by the long and short pile range was 0.83-4.15 and 0.59-3.36%, respectively. For the other parameters considered in this article viz. pile spacing, subsoil stiffness, cushion stiffness and thickness, and applied working load, the increment in % load sharing of the long and short pile range was 3.45-4.15, 1.3-5.79, 1.48-3.36, 4.15-4.79, and 3.67-4.15% and 3.36-4.67, 1.43-4.99, 1.48-3.36, 3.36-3.64, and 1.38-3.36% of the imposed load, respectively. Moreover, the long piles' load sharing proportion was higher than that of short piles, and peripheral piles received larger load proportion.

Diddana, T. Z., Kelkay, G. N., & Tescha, E. E. (2021). Nutritional Composition and Sensory Acceptability of Stinging Nettle (Urtica simensis) Flour-Supplemented Unleavened Maize (Zea mays L.) Flatbread (Kitta). *International Journal of Food Science*, 2021. Scopus. https://doi.org/10.1155/2021/6666358

#### Abstract

In Ethiopia, a few studies had been conducted to improve the nutritional values and sensory acceptability of maize-based flatbread. These studies did not address indigenous edible wild green vegetables like stinging nettle (Urtica simensis). Consequently, there was a scientific report gap on the effect of incorporating stinging nettle leaf flour into local staple foods like flatbread. Therefore, this study was intended to investigate the nutritional composition and sensory acceptability of unleavened maize (Zea mays L.) flatbread (Kitta) supplemented with stinging nettle (Urtica simensis) flour. The flatbread was developed from composite flour of germinated maize and nettle leaf in a ratio of 90: 10, 85: 15, 80: 20, and 75: 25, respectively. Hundred percent (100%) nongerminated maize flour flatbread was used as control. Proximate composition, minerals (Fe, Zn, and Ca), and vitamin C contents were analyzed. The sensory acceptability test was rated by a nine-point hedonic scale. The result revealed that crude protein and fat decreased from 11.02 g to 7.21 g and 1.12 g to 0.48 g, respectively, when the amount of nettle flour supplementation increased from 0% to 25%. On the contrary, total ash, crude fiber, and total carbohydrate slightly increased from 1.84 to 3.81 g, 2.19 to 3.05, and 75.53 to 80.05 g, respectively. The calcium, zinc, and iron content significantly (p < 0.05) increased from 60.51 to 283.74 mg, 5.09 to 9.24 mg, and 1.72 to 3.59 mg when the amount of nettle flour increased from 0% to 25%, respectively. All

sensory acceptability tests showed decrement with increasing the amount of nettle flour, but the control group has the highest acceptability.

Honja Kabero, T., Bosha, T., Feleke, F. W., Haile Weldegebreal, D., & Stoecker, B. (2021). Nutritional Status and Its Association with Cognitive Function among School Aged Children at Soddo Town and Soddo Zuriya District, Southern Ethiopia: Institution Based Comparative Study. *Global Pediatric Health*, 8. Scopus. https://doi.org/10.1177/2333794X211028198

#### Abstract

About 1 billion stunted school-aged children are growing up with impaired mental development which can lead to low cognitive performance, reduced school achievement, and low productivity. But there is scarce evidence on cognitive function, school performance and their associated factors among school aged children. The main aim of this study was to assess cognitive function, school performance and determine their association with nutritional status among school children aged 7 to 10 years at Soddo Town and Soddo Zuriya Woreda, Wolaita Zone, Southern Ethiopia. Institutional comparative cross-sectional study was conducted on a total sample of 178 primary school children. The Raven's Color Progressive Matrices (RCPM) and selected tests from Kaufman assessment battery for children second edition were used. Mid-year average students' examination result was also used. Data were analyzed by using SPSS version 25, WHO Anthro plus, and independent sample t-test. Bivariate and multivariate linear regression analyses were also used. Mean ( $\pm$ SD) cognitive test scores of urban study participants was 18.7  $\pm$  3.4 for RCPM which was higher (P <.001) as compared to rural (16.5  $\pm$  3.3). The urban mean cognitive test scores was also higher for both pattern reasoning and visual processing with (P < .001) as compared to rural counterparts. School performance was higher (P < .001) for urban. Maternal education (P < .002) and wealth index (P < .006) were positively predicted while stunting (P < .001) negatively predicted cognitive function test scores and school performance. Cognitive function and school performance of study participants were associated with their nutritional status and rural participants had significantly lower mean scores as compared to urban counterparts. Further study should be done to community level.

Fekade, M., Bayissa, M., & Nurfeta, A. (2021). Nutritive value of major browse species in east dembia district, central gondar, Ethiopia. *Agricultural Science Digest*, 41(1), 76–80. Scopus. https://doi.org/10.18805/ag.D-192

#### Abstract

#### Background

Regardless of having ample number of farm animals, its contribution to GDP is limited due to insufficient year round livestock feed supply in terms of quantity and quality, particularly during the dry season. This study was conducted to assess the most commonly used browse species as livestock feed particularly during dry period and to determine their nutritive value from four kebeles of East Dembiya district.

#### Methods

Stratified random sampling was used for the selection of respondents. A total of 12 plots of 20m \*20m (400m2) were established at an interval of 200m along the transect line to identify and record the available browse species. The leaves and petioles of A. abyssinica, C. africana, F. thonigii, F. sycomorus, V. amygdolina, M. arbutifolia and A. seyal were collected for chemical analysis. General linear model procedure of SAS was used for statistical analysis.

#### Result

The mean CP content of the browse species ranged from 12.13% (F. sycomorus) to 29.74% (V. amygdolina). The IVDMD varied from 38.5% for M. arbutifolia to 71.67% for F. sycomorus. High gas production from immediately soluble component (a) was recorded for C. africana. The gas production from insoluble but potential degradable fraction (b), production potential (a+b) and organic matter digestibility were higher for F. thounigii but low for V. amygdolina. The browse species in the current study could be used as protein supplements to livestock fed on low quality feeds due to their high levels of crude protein, low fiber contents and high digestibility potentials.

Shiferaw, M., Beyene, H., Gitore, W. A., & Mangasha, A. E. (2021). Occupational safety practices and associated factors among employees in Jinmao and Philip Van Heusen Textile Ethiopia, Hawassa Industrial Park, south Ethiopia. *International Journal of Occupational Safety and Ergonomics*. Scopus. https://doi.org/10.1080/10803548.2021.1946288

#### Abstract

#### **Objectives**

Occupational health and safety practice in the textile factory has been neglected and in Ethiopia there is little evidence on occupational safety practice and associated factors in a textile factory. This study aimed to assess the occupational safety practices and associated factors among employees in Jinmao and Philip Van Heusen Textile Ethiopia, Hawassa Industrial Park, south Ethiopia in 2019.

#### Methods

An institutional cross-sectional study was conducted from January to February 2019. A total of 345 participants were included in the study using a stratified random sampling method. Data were collected through face-to-face interviews and an observational checklist, and analyzed using SPSS version 20. Bivariate and multivariate analysis assessed the association between dependent and independent variables.

#### Results

Among the 345 (96%) respondents recruited, more than four-fifths (82%) were single. Almost two-thirds (63.8%) were in the age range 21–24 years. Attending safety training (adjusted odds ratio [AOR]: 1.73, 95% confidence interval [CI] [1.05–2.81]), orientation on occupational safety practice (AOR: 2.18, 95% CI [1.15–4.14]) and working in the weaving section (AOR: 3.58, 95% CI [2.09–6.12]) were independent predictors of safety practice.

#### Conclusions

The level of occupational safety practice was very low compared to studies in developing countries.

Gari, T., Solomon, T., & Lindtjørn, B. (2021). Older children are at increased risk of Plasmodium vivax in south-central Ethiopia: A cohort study. *Malaria Journal*, 20(1). Scopus. https://doi.org/10.1186/s12936-021-03790-3

#### Abstract

#### Background

Better understanding of the distribution of Plasmodium vivax and its risk factors could be used to prevent and control malaria infection. Therefore, the aim of this study was to characterize the distribution and risk factors of P. vivax, and to compare them with Plasmodium falciparum occurrence in south-central Ethiopia.

#### Methods

A cohort of 34,548 individuals were followed for 121 weeks between 2014 and 2016 as part of larger cluster randomized controlled trial to evaluate the effect of long-lasting insecticidal nets (LLINs) and indoor residual spraying (IRS) on malaria prevention in Ethiopia. Weekly home visit (active search) and patient self- report to health post (passive search) between the weekly home visits were used to register malaria cases. A blood sample was collected by finger prick and malaria was diagnosed using rapid diagnostic test (RDT). Generalized estimating equation (GEE) Poisson model that accounts for repeated measure of malaria episodes was applied to assess the risk factors of P. vivax episode.

#### **Results**

The overall incidence rate of P. vivax was 7.4 episodes per 1000 person-years of observation. The study showed households closer to the lake Zeway and Bulbula river (potential mosquito breeding sites) were more at risk of P. vivax infection (incidence rate ratio (IRR): 1.33; 95% CI = 1.23– 1.45). Furthermore, the age group under 5 years (IRR: 1.40, 95% CI = 1.10–1.79), the age group 5–14 years (IRR: 1.27, 95% CI = 1.03–1.57), households with less educated household head (IRR: 1.63, 95% CI = 1.10–2.44) and house roof made of thatch/leaf (IRR: 1.35, 95% CI = 1.11–1.65) were at higher risk for P. vivax. Similar explanatory variables such as distance from the breeding sites, age group (under 5 years but not 5–14 years old), educational status and type of housing were also found to be the predictors of P. falciparum incidence.

#### Conclusion

Households living closer to a mosquito breeding site, age group under 15 years, less educated household heads and thatch/leaf roof housing were the risk factor for P. vivax. The result of this study can be used for tailored interventions for malaria control and prevention by prioritizing those living close to potential mosquito breeding site, enhancing bed net use of children less than 15 years of age, and improving housing.

Merbold, L., Scholes, R. J., Acosta, M., Beck, J., Bombelli, A., Fiedler, B., Grieco, E., Helmschrot, J., Hugo, W., Kasurinen, V., Kim, D.-G., Körtzinger, A., Leitner, S., López-Ballesteros, A., Ndisi, M., Nickless, A., Salmon, E., Saunders, M., Skjelvan, I., ... Kutsch, W. L. (2021). Opportunities for an African greenhouse gas observation system. *Regional Environmental Change*, *21*(4). Scopus. https://doi.org/10.1007/s10113-021-01823-w

#### Abstract

Global population projections foresee the biggest increase to occur in Africa with most of the available uncultivated land to ensure food security remaining on the continent. Simultaneously, greenhouse gas emissions are expected to rise due to ongoing land use change, industrialisation, and transport amongst other reasons with Africa becoming a major emitter of greenhouse gases globally. However, distinct knowledge on greenhouse gas emissions sources and sinks as well as their variability remains largely unknown caused by its vast size and diversity and an according lack of observations across the continent. Thus, an environmental research infrastructure—as being setup in other regions—is more needed than ever. Here, we present the results of a design study that developed a blueprint for establishing such an environmental research infrastructure in Africa. The blueprint comprises an inventory of already existing observations, the spatial disaggregation of locations that will enable to reduce the uncertainty in climate forcing's in Africa and globally as well as an overall estimated cost for such an endeavour of about 550 M€ over the next 30 years. We further highlight the importance of the development of an e-infrastructure, the necessity for capacity development and the inclusion of all stakeholders to ensure African ownership.

### Khamies, M., Magdy, G., Kamel, S., & Khan, B. (2021). Optimal Model Predictive and Linear Quadratic Gaussian Control for Frequency Stability of Power Systems Considering Wind Energy. *IEEE Access*. Scopus. https://doi.org/10.1109/ACCESS.2021.3106448

#### Abstract

This work presents a new robust control technique that combines a model predictive control (MPC) and linear quadratic gaussian (LQG) approach to support the frequency stability of modern power systems. Moreover, the constraints of the proposed robust controller (MPC-LQG) are fine-tuned based on a new technique titled Chimp optimization algorithm (ChOA). The effectiveness of the proposed robust controller is tested and verified through a multi-area power system (i.e., single-area and two-area power systems). Each area contains a thermal power plant as a conventional generation source considering physical constraints (i.e. generation rate constraint, and governor dead band) in addition to a wind power plant as a renewable resource. The superiority of the proposed robust controller is confirmed by contrasting its performance to that of other controllers which were used in load frequency control studies (e.g., conventional integral and MPC). Also, the ChOA's ingenuity is verified over several other powerful optimization techniques; particle swarm optimization, gray wolf optimization, and ant lion optimizer). The simulation outcomes reveal the effectiveness as well as the robustness of the proposed MPC-LQG controller based on the ChOA under different operating conditions taking into account different load disturbances and several penetration levels of the wind power.

## Farhat, M., Kamel, S., Atallah, A. M., & Khan, B. (2021). Optimal power flow solution based on jellyfish search optimization considering uncertainty of renewable energy sources. *IEEE Access*, *9*, 100911–100933. Scopus.

#### Abstract

Today's electrical power system became more complex interconnected network that is expanding every day. The transmission lines of the power system are more severely loaded than ever before. Hence, the power system is facing many problems such as power losses increasing, voltage instability, line overloads, etc. The optimization of real and reactive powers due to the installation of energy resources at appropriate buses can minimize the losses and improve the voltage profile especially, for congested networks. As a result, the optimal power flow problem (OPF) is considered more important tool for the processes of planning and operation of power systems. OPF is a very significant tool for power system operators to meet the electricity demand of the consumers efficiently, and for the reliable operation of the power system. However, the incorporation of renewable energy sources (RESs) into the electrical grid is a very challenging problem due to their intermittent nature. In this paper, the proposed power flow model contains three different types of energy sources: thermal power generators representing the conventional energy sources, wind power generators (WPGs), and solar photovoltaic generators (SPGs) representing RESs. Uncertain output powers from WPGs and SPGs are forecasted with the aid of Weibull and lognormal probability distribution functions (PDF), respectively. The under and overestimation output powers of RESs are taken into consideration while formulating the objective function through adding a penalty and reserve cost, respectively. Moreover, carbon tax is imposed to the main objective function to help in reducing carbon emissions. A jellyfish search optimizer (JS) is employed to reach optimization in the modified IEEE 30-bus test system to validate its feasibility. To examine the effectiveness of the proposed JS algorithm, its simulation results are compared with the results of four other nature-inspired global optimization algorithms. The developed OPF algorithm considers several practical cases such as generation uncertainty of renewable energy sources, time-varying load and the ramp rate limits of thermal generators. The simulation results show the effectiveness of the JS algorithm in solving the OPF problem in terms of minimization of total generation cost and solution convergence.

#### Singh, B., Mamuye, W., & Jiru, M. G. (2021). Optimization of Friction Welding Process Parameters for Weldment of Aluminium–Copper Electrical Connector (Vol. 26, p. 138). Scopus. https://doi.org/10.1007/978-981-15-7557-0\_11

#### Abstract

Friction welding of aluminium and copper has been widely used in electrical transmission in production of bimetallic (lug) or connectors. The use of dissimilar metal connector is to prevent high electrical losses due to contact resistance and mechanical contact between aluminium and copper which is not permanent in their application for the fact of environmental degradation. Galvanic corrosion between the two metals in mechanical contact is saviour and it is technically

distractive; hence friction welding of the two metals solved the problem by introducing technically acceptable joint between the two metals. Mechanical strength of the connectors has been very important to withstand stress caused by heat and mechanical force. Electrical resistance behaviour has also been highly important. The aim of this research has to optimize process parameters that gave the best electrical and mechanical properties of the weldment. The selected materials and method are different and unique from any other studies. Optimization of welding parameter that gave two characteristics of their performances such as strength and electrical resistance when optimized successfully. Grey relational analysis, ANOVA and Taguchi method have been used for the optimization process. Vertical drilling machine was used for the friction welding process and the machine was 1.7 KW power with the rotational speed of 3060 RPM. The optimization of the process parameters of the friction welding, i.e. RPM, friction pressure and friction time was conducted. The obtained optimum setting for two performance output characteristics such as strength and electrical resistance was friction time at 20 seconds, friction pressure 117 (MPa) and 1050 (RPM). Furthermore, based on two performance studies, friction pressure has a basic parameter that determined the desired response.

Vijayan, V., Parthiban, A., Sathish, T., Sankar, L. P., Kumar, S. D., Saravanakumar, S., & Tafesse, D. (2021). Optimization of Reinforced Aluminium Scraps from the Automobile Bumpers with Nickel and Magnesium Oxide in Stir Casting. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/3735438

#### Abstract

Here, the investigation is spotlighted on the aluminium alloy from the waste materials of the automobile bumpers which is a reinforced metal matrix composite created with 5 percentage of nickel and 5 percentage of magnesium oxide through the stir casting method. The stir casting process inputs parameters such as pressure of squeezing, time of squeezing, and speed of stirrer which were optimized based on the two mechanical properties' outcome such as the tensile strength (TS) and Rockwell hardness. There are nine different experiments which were conducted based on the L9 array. The Taguchi method is used to identify the optimum input values for the greatest result of the processing condition by Minitab software. The responses-based parameters were ordered based on the rank identified through the investigational effects. Finally, the optimized

input consideration values and the linear equations are recommended for both the considered outputs as conclusions.

Alemu, T., Wamatu, J., Tolera, A., Beyan, M., Eshete, M., Alkhtib, A., & Rischkowsky, B. (2021). Optimizing near infrared reflectance spectroscopy to predict nutritional quality of chickpea straw for livestock feeding. *Animals*, *11*(12). Scopus. https://doi.org/10.3390/ani11123409

#### Abstract

Multidimensional improvement programs of chickpea require screening of a large number of genotypes for straw nutritive value. The ability of near infrared reflectance spectroscopy (NIRS) to determine the nutritive value of chickpea straw was identified in the current study. A total of 480 samples of chickpea straw representing a nation-wide range of environments and genotypic diversity (40 genotypes) were scanned at a spectral range of 1108 to 2492 nm. The samples were reduced to 190 representative samples based on the spectral data then divided into a calibration set (160 samples) and a cross-validation set (30 samples). All 190 samples were analysed for dry matter, ash, crude protein, neutral detergent fibre, acid detergent fibre, acid detergent lignin, Zn, Mn, Ca, Mg, Fe, P, and in vitro gas production metabolizable energy using conventional methods. Multiple regression analysis was used to build the prediction equations. The prediction equation generated by the study accurately predicted the nutritive value of chickpea straw (R2 of cross validation >0.68; standard error of prediction <1%). Breeding programs targeting improving food-feed traits of chickpea could use NIRS as a fast, cheap, and reliable tool to screen genotypes for straw nutritional quality.

Parthiban, A., Vijayan, V., Sathish, T., Dinesh Kumar, S., Ponraj Sankar, L., Parthipan, N., Tafesse, D., & Tufa, M. (2021). Parameters of Porosity and Compressive Strength-Based Optimization on Reinforced Aluminium from the Recycled Waste Automobile Frames. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/3648480

#### Abstract

Automobile industries were ready to recycle the waste old parts as well as the damaged parts of the old vehicles as much as possible. This study mainly focused on the recycling of the waste and damaged aluminium frames of the automobile bodies. These aluminium-based frames only collected the metal matrix composite created by reinforcement of 3% silicon carbide (SiC) and 3% high carbon steel. The stir casting method is chosen to make the composites. Optimization is done by Taguchi ANOVA technique. Three input parameters such as stir speed, time of squeeze, and the temperature of the preheating were considered. The outputs such as compressive strength and porosity were experimentally measured with the combination of nine (L9) experimental trails. The measured experimental results were analyzed and optimized with the help of Taguchi technique with different plots for clear identification. The optimized parameters based on low porosity and high compressive strength were recommended for conclusion.

Parthiban, A., Vijayan, V., Sathish, T., Dinesh Kumar, S., Ponraj Sankar, L., Parthipan, N., Tafesse, D., & Tufa, M. (2021). Parameters of Porosity and Compressive Strength-Based Optimization on Reinforced Aluminium from the Recycled Waste Automobile Frames. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/3648480

#### Abstract

Today East African pastoralists including Borana are increasingly engaged in livelihood diversification evolved over time as an adaptation strategy in the context of climate change and other stressors. This study was undertaken in Borana, southern Ethiopia, to understand women's involvement in livelihood diversification, as well as their gains and losses. The study employed household survey, focus group discussions, key informant interviews and field observations for data collection. Results show that traditional cattle-centered pastoralism has been

transforming into more diversified livelihood activities such as crop production, animal trade, petty trade, poultry farming, and selling of firewood and charcoal. Although men dominate most of the pastoral livelihood diversification activities, this study shows women are also playing significant roles in petty trade, poultry farming, and selling of firewood, which increases women's workload and income and improves their decision-making power in the household. Moreover, the proactive role played by Borana women in diversification activities highlights women's initiatives in adaptation and challenges the dominant discourse that focuses on women's vulnerability to changes. Furthermore, a better understanding of the roles women play in diversification enables the use of their knowledge and expertise in designing well-informed policies and strategies.

Deribe, B., Ayalew, M., Geleta, D., Gemechu, L., Bogale, N., Mengistu, K., Gadissa, A., Dula, D., Ababi, G., & Gebretsadik, A. (2021). Perceived quality of nursing care among cancer patients attending hawassa university comprehensive specialized hospital cancer treatment center; hawassa southern ethiopia: Cross-sectional study. *Cancer Management and Research*, *13*, 1225–1231. Scopus. https://doi.org/10.2147/CMAR.S275729

#### Abstract

#### Background

Cancer has become one of the most common and the second leading cause of death. According to grounded theory, quality care is meeting all the needs of the patients. Low-quality nursing care relates omission of nursing care required to meet patients' need. Quality of nursing care in oncologic setting was nursing practice area where studies are limited. Objective: The aim of the study was to assess the perceived quality of nursing care among patients with cancer attending Hawassa University comprehensive specialized Hospital.

#### Methods

A quantitative Cross-sectional study was conducted. Among the proposed 422 patients with cancer, using a simple random sampling technique 415 patients were included in this study. Seven data were discarded due to incompleteness and inconsistency between collected data and patient medical record. Data were collected using structured question-naires and Quality of Oncology Nursing Care Scale. We carried out statistical analysis using SPSS V-20. We used descriptive analysis to examine the quality of oncology nursing care.
# Results

The mean age of patients was 42.51 ( $\pm$ 14.24) years, among patients diagnosed with cancer more than one-third 148 (35.70%) had breast cancer. The majority of patients with cancer 173 (41.70%) were in stage-III. Nearly two-third 266 (64.10%) of patients were on chemotherapy. Among study participants on treatment, 249 (60.00%) perceived they received good quality of nursing care. The mean score related to the domain of support and confirmation is 62.73  $\pm$  7.26. In terms of spiritual care, the mean score is 21.03  $\pm$  5.37.

# Conclusion

The perceived quality of nursing care was high however not all domains of oncology care were achieved. We recommend Detail and focused study to explore important predictors' quality nursing care.

Vivek, S., Ravi, R., Stephen Leon, J., Suresh, G., Selvaraj, M., Manikandan, K., & Meenakshi, C. M. (2021). *Performance evaluation of simple DPHX with helical baffles in annulus side*. 1921(1). Scopus. https://doi.org/10.1088/1742-6596/1921/1/012090

#### Abstract

In this paper, turbulent thermo-hydraulic analysis of water-to-water passively augmented DPHX with helical baffles is studied by varying the parameters, mass flow rate and baffle spacing. The baffles in annulus side of the inner pipe augments the rate of heat transfer on comparing with the simple DPHX. The influence of spacing between baffles on the heat transfer rate is investigated by varying the governing parameters. The Reynolds number is varied between 22,000 and 12, 5000 for three different baffle spacing ( $\beta$ ) values of 75 mm, 100 mm and 125 mm. The thermo-hydraulic performance parameters pressure drop, Nusselt number and friction factor are examined and put forth corresponding to experimental data. From the results, it is inferred that the effect of baffles on the annulus side of the hot fluid flows through the inner pipe enhances heat transfer rate with increase in the Nu and decreases as the baffle spacing increases.

Alemayehu, T., Asnake, S., Tadesse, B., Azerefegn, E., Mitiku, E., Agegnehu, A., Nigussie, N., Mariam, T. H., & Desta, M. (2021). Phenotypic detection of carbapenem-resistant gramnegative bacilli from a clinical specimen in sidama, ethiopia: A cross-sectional study. *Infection and Drug Resistance*, 14, 369–380. Scopus. https://doi.org/10.2147/IDR.S289763

## Abstract

#### Background

Carbapenem-resistant gram-negative bacteria are an emergent source of both community-acquired and healthcare-associated infection that poses a substantial hazard to public health. This study aimed to conclude the magnitude of carbapenem resistance gram-negative bacteria from a clinical specimen at Hawassa University Comprehensive Specialized Hospital.

#### Methods

A hospital-based cross-sectional study was accompanied from February 13 to June 7, 2020, in which consecutive patients with 103 gram-negative bacteria were encompassed. The isolates included were 54 urine, 17 blood, 17 pusses, 4 cerebrospinal fluid (CSF), 3 aspirates, 3 effusions, 2 stools, 2 ear discharges, and 1 nasal swab. A semi-structured questionnaire was used to gather socio-demographic data from the attendant and clinical data from the patient's chart. Patients admitted in any wards and visited outpatients department were included for the study if gramnegative bacteria was identified for those who accepted the consent. A routine manual culture, Gram's staining and biochemical tests used to identify the bacteria. Antibiotic susceptibility was determined for twelve antibiotics including cotrimoxazole, ceftazidime, meropenem, gentamycin, chloramphenicol, ampicillin, ciprofloxacin, cefotaxime, cefuroxime, nitrofurantoin, piperacillintazobactam, and amikacin using the Kirby-Bauer disc diffusion method. Modified carbapenem inactivation (mCIM) method was used to determine carbapenem resistance using meropenem disk as per the recommendation of Clinical and Laboratory Standards Institute guideline. Statistical package for social science software version 21 was used for data entry and analysis. The odds ratio at 95% confidence interval (CI) and p-value <0.05 were taken as a statistically significant association.

#### Results

Generally, 111 gram-negative bacteria were identified from 103 patients. Of 111 isolates, thirteen isolates (nine resistance and four intermediates) were identified in disk diffusion testing for

meropenem. Of this, 10 isolates were carbapenemases producer with the overall rates of 9% in the Modified carbapenem inactivation method (mCIM). Pseudomonas spp. 3 (30.0%), E. coli, K. pneumonia, Acinetobacter spp. each two (20.0%), and K. oxytoca 1 (10.0%) were identified as carbapenemases positive. The rates of the multidrug, extensive, pan drug were 86.5, 43.3, and 1.8, respectively. Ampicillin 94 (97.9%), followed by cefuroxime 52 (91.2%), cefotaxime 94 (88.7%), cotrimoxazole 58 (88.1%), ceftazidime 40 (83.3%), ciprofloxacin 47 (77.1%), nitrofurantoin 35 (70.0%), gentamycin 71 (65.7%), with high level of resistance. However, piperacillin-tazobactam 41 (48.8%), chloramphenicol 25 (47.2%), meropenem 13 (11.7%), and amikacin 9 (8.5%) were with low rates of resistance. In this study, there were no variables statically associated with carbapenem resistance that is p > 0.05.

# Conclusion

Our study showed that carbapenem-resistant gram-negative bacilli are 9% in the study area. Our finding signposts that ampicillin, cefuroxime, cefotaxime, cotrimoxazole, ceftazidime, ciprofloxacin, nitrofurantoin, and gentamycin with a high rate of resistance >50%. However, piperacillin-tazobactam, chloramphenicol, meropenem, and amikacin were at low rates of resistance. Therefore, a measure should be taken to contain carbapenem resistance gram-negative bacteria in the study area. Further, study with better method needs to be conducted to conclude the real scenario of carbapenem resistance.

# Getie, A., Kiflu, A., & Meteke, G. (2021). Phosphorus Sorption Characteristics of Luvisols and Nitisols in North Ethiopian Soils. *Applied and Environmental Soil Science*, 2021. Scopus. https://doi.org/10.1155/2021/8823852

#### Abstract

Crop response to phosphorus (P) application is often erratic in most acidic soil types. The main processes for P losses from agricultural fields are fixation, crop removal, erosion, surface runoff, and subsurface leaching. The purpose of this experiment was to evaluate adsorption properties of selected soils, determine the external phosphorous requirements (EPRs) of the soils, and identify factors contributing to P sorption in two soils in North Ethiopia. In this experiment, separately weighed 1 g soil samples were equilibrated with KH2PO4 at rates of 0.5, 5, 10, 20, 30, 40, and 50 mg PL-1. The P sorption data were fitted well with both Langmuir and Freundlich models with average r2 values of 0.91 and 0.88, respectively. The adsorption maximum (Xm) of the Langmuir

isotherm ranged from 588.20 mg P kg-1 soil in Luvisols to 833.3 mg P kg-1 soil in Nitisols. The EPRL values ranged between 86.20 to 93.28 mg P kg-1 for soils of the study area. Among the soil properties, clay content and Ex. Al were positively correlated with Xm. The path analysis revealed that clay, pH, and Av. P had a direct effect on P sorption parameters. The EPRL of the studied soils was 3.44 to 3.6 times greater than the blanket P fertilizer rate recommendation. It is concluded that P sorption models can effectively be used to discriminate soils based on P fixation ability. The result further indicates that the current P fertilizer application rate of 50 kg P ha-1 being practiced across all soil types should be revised after validating the models and EPR values estimated in this study for each soil both under greenhouse and in-the-field conditions.

Kassa, Z. Y., Abeje, A., Ashegu, T., & Hadra, N. (2021). Physical Violence and Associated Factors among Women of Reproductive Age in Gedeo Zone, Southern Ethiopia. *Ethiopian Journal of Health Sciences*, *31*(5), 955–962. Scopus. https://doi.org/10.4314/ejhs.v31i5.6

#### Abstract

# Background

Physical violence against women of reproductive age is a significant public health problem worldwide. This study aimed to assess physical violence and associated factors among women of reproductive age.

# Method

A community-based cross-sectional study design was implemented from August 1 to September 30, 2018, including women of reproductive age in Gedeo Zone Southern Ethiopia. A stratified, two-stage cluster sampling technique was used. Finally, the study population was selected from the respective source population using a simple random sampling technique. Data were checked, coded, and entered Epi data version 3.1 and exported to SPSS version 20 for analysis. The wealth index was computed using the principal component analysis. Bivariate and multivariable analyses were computed to identify the determinants of physical violence among women of reproductive age.

#### Results

Experiencing at least one type of physical violence among women of reproductive age was 14.7% (95%CI: 11.7, 17.4). Study participants whose spouse had any habit (AOR: 3.56; 95%CI: 1.75, 7.25) and whose spouse had watched pornography counterpart ((AOR: 1.58; 95%CI: 1.02, 3.17)

had significantly higher odds of experiencing physical violence among women of reproductive age. Spouses had any habit like alcohol drinking, chat chewing, cigarette smoking, and seeing pornography significantly increased physical violence among reproductive-age women. Therefore, the responsible stakeholders should work on the means to the spouse can alleviate any form of habit like alcohol drinking, chat chewing, cigarette smoking, and seeing pornography could decrease physical violence in women of reproductive age.

Hussen, S., Asnake, S., Wachamo, D., & Tadesse, B. T. (2021). Pneumococcalnasopharyngeal carriage and antimicrobial susceptibility profile in children under five insouthernEthiopia.F1000Research,9.Scopus.https://doi.org/10.12688/f1000research.27583.3

## Abstract

# Background

Streptococcus pneumonia causes high morbidity and mortality, particularly in children under five. Nasopharyngeal (NP) carriage predisposes individuals to pneumococcal infection and horizontal spread within the community. Overuse of antibiotics has been linked to increased risk of antimicrobial resistance to S. pneumonia. We investigated NP carriage rate and resistance to commonly prescribed antibiotics in under-five children visiting a public referral center in southern Ethiopia.

#### Methods

In total, 413 under 5 children who visited the outpatient department for a health check-up, immunization or acute mild illnesses underwent NP sampling. Parent/caregiver surveys were administered at the clinic. Sterile plastic applicator rayon tipped swabs were used for NP sampling. Antimicrobial susceptibility testing was performed using modified the disk diffusion method.

# Results

S. pneumonia NP carriage was observed in 39% [95% confidence interval (CI): 34.4-43.8]. Living with one or more sibling (AOR (adjusted odds ratio) 1.95: 95% CI: 1.01, 3.76), age group of 3-23 months (AOR 2.31: 95% CI: 1.07, 4.98), co-sleeping with family (AOR 2.09, 95% CI: 1.16, 3.79), attendance at kindergarten/day-care (AOR 1.84: 95% CI: 1.09, 3.11) and malnutrition independently increased S. pneumonia carriage at the individual level. S. pneumonia was highly

resistant to Oxacillin (38.5%), Tetracycline (37.3%), and Trimethoprim-sulfamethoxazole (34.2%). Multi-drug resistance was observed in 42.2% of isolates.

# Conclusions

A high streptococcal NP carriage rate was observed in under-five children. The high level of resistance to commonly used antibiotics calls for enhancing national surveillance of resistance patterns and enforce antibiotic stewardship efforts.

# Chiriko, A. Y. (2021). Political violence and hotels: Economic consequences and response strategies. *Anatolia*, 32(3), 419–429. Scopus. https://doi.org/10.1080/13032917.2021.1883078

#### Abstract

The purpose of this study is to examine the economic consequences of political violence on hotels operating in Hawassa city and assess their response strategies to deal with the crisis. A qualitative approach involving semi-structured interviews with 13 hotel general managers in Hawassa city was employed, and data from interviews were analysed using thematic analysis. Study findings uncovered that political violence inflicted significant economic costs on hotels operating in the city. To deal with the effects of political violence, hotels put in place temporary but creatively crafted tools that resorted to cost reduction and marketing strategies. The study could help to better understand the vulnerability and resilience of tourism to political violence in the context of small-city hotels.

# Teferra, T. F. (2021a). Possible actions of inulin as prebiotic polysaccharide: A review. *Food Frontiers*, 2(4), 407–416. Scopus. https://doi.org/10.1002/fft2.92

# Abstract

This review summarizes the nature, types, and properties of inulin polysaccharides and their applications as prebiotic dietary fibers. Natural food and commercial plant sources of inulin and extraction methods are presented. The physicochemical and functional properties of inulin are summarized. The prebiotic roles of inulin and their mechanisms of action are detailed. Inulin acts as prebiotic dietary fiber with multiple putative health benefits. It reduces caloric intake and contributes to reduced blood glucose and plasma lipid/cholesterol levels when used as sugar and

fat replacers. It also stimulates immune systems and protects the colon mucosa against carcinogenesis and inflammation. Inulin also alters the composition and population of the gut microbiota. It stimulates the growth and activities of health beneficial microorganisms while inhibiting enteropathogenic bacteria. The beneficial microorganisms ferment inulin and produces acids including short-chain fatty acids that lower the pH in the colon and inhibit pathogens. The health beneficial bacteria also produce other metabolites that positively influence human health. The consumption of inulin is however, associated to symptoms of gastrointestinal discomfort, when consumed at higher levels to meet the daily recommendation of dietary fiber. Potential solutions to the limitations are forwarded as future research ideas and policy inputs.

# Demissie, D., Geremew, T., Chernet, A. Z., & Ali, M. M. (2021). Potency of commonly retailed antibiotics in pharmacies found in Adama, Oromia regional state, Ethiopia. *PLoS ONE*, *16*(7 July). Scopus. https://doi.org/10.1371/journal.pone.0253971

### Abstract

#### Introduction

Antibiotics are commonly used for the treatment and prevention of bacterial infections. The potency of antibiotics can be affected by factors such as temperature, light, moisture, and storage conditions. Inappropriate storage and transportation of antibiotics may lead to loss of potency earlier than the expiry date. The aim of this study was to determine the potency and associated factors of commonly retailed antibiotics.

#### Method

Institution-based cross-sectional study was conducted on commonly retailed antibiotics in pharmacies that are available in Adama, Ethiopia from March 2018 to June 2018. This study focused on commonly ordered antibiotics such as amoxicillin, azithromycin, ciprofloxacin, and ceftriaxone. Antibiotics to be tested were selected by using a simple random sampling technique. Socio-demographic and related data were collected using a semi-structured questionnaire. Antibiotic susceptibility testing was performed using the disc diffusion method as described in the Clinical Laboratory Standard Institute guideline.

#### Results

Mean inhibition zones of amoxicillin, ciprofloxacin, azithromycin, and ceftriaxone were  $14.2 \pm 4$  mm,  $30.9 \pm 4.2$  mm,  $17.47 \pm 3.83$  mm, and  $32.7 \pm 1.8$  respectively. Out of 164 antibiotics tested, 61% passed the potency test. The potency of antibiotics varies across different countries in which 53.7% and 54.6 of antibiotics from India and Ethiopia passed the potency test. All ceftriaxone tested in this study passed the potency test. Factors such as air condition of pharmacy (X2 = 4.27; p = 0.039), source of all antibiotics (X2 = 5.41; p = 0.02), and source of amoxicillin (X2 = 4.73; p = 0.03) were significantly associated with potency of antibiotics.

# Conclusions

About 40% of antibiotics tested in the current study did not pass the potency test; this warrants further investigation to identify the magnitude of the problem and its causes at a large scale.

Beressa, T. B., Deyno, S., Mtewa, A. G., Aidah, N., Tuyiringire, N., Lukubye, B., Weisheit, A., Tolo, C. U., & Ogwang, P. E. (2021). Potential Benefits of Antiviral African Medicinal Plants in the Management of Viral Infections: Systematic Review. *Frontiers in Pharmacology*, *12*. Scopus. https://doi.org/10.3389/fphar.2021.682794

# Abstract

#### Background

Viruses cause various human diseases, some of which become pandemic outbreaks. This study synthesized evidence on antiviral medicinal plants in Africa which could potentially be further studied for viral infections including Coronavirus disease 2019 (COVID-19) treatment.

# Methods

PUBMED, CINAHIL, Scopus, Google Scholar, and Google databases were searched through keywords; antiviral, plant, herb, and Africa were combined using "AND" and "OR". In-vitro studies, in-vivo studies, or clinical trials on botanical medicine used for the treatment of viruses in Africa were included.

#### Results

Thirty-six studies were included in the evidence synthesis. Three hundred and twenty-eight plants were screened for antiviral activities of which 127 showed noteworthy activities against 25 viral species. These, were Poliovirus (42 plants), HSV (34 plants), Coxsackievirus (16 plants), Rhinovirus (14plants), Influenza (12 plants), Astrovirus (11 plants), SARS-CoV-2 (10 plants),

HIV (10 plants), Echovirus (8 plants), Parvovirus (6 plants), Semiliki forest virus (5 plants), Measles virus (5 plants), Hepatitis virus (3 plants), Canine distemper virus (3 plants), Zika virus (2 plants), Vesicular stomatitis virus T2 (2 plants). Feline herpesvirus (FHV-1), Enterovirus, Dengue virus, Ebola virus, Chikungunya virus, Yellow fever virus, Respiratory syncytial virus, Rift Valley fever virus, Human cytomegalovirus each showed sensitivities to one plant. **Conclusion** 

The current study provided a list of African medicinal plants which demonstrated antiviral activities and could potentially be candidates for COVID-19 treatment. However, all studies were preliminary and in vitro screening. Further in vivo studies are required for plant-based management of viral diseases.

Mitkie, A. A., Bekele, F. B., & Debiso, A. T. (2021). Predictors of adverse drug reaction among adult hiv-infected patients on antiretroviral therapy in government hospitals of kaffa zone, ethiopia; november 2018: A retrospective cohort. *Pan African Medical Journal*, *38*. Scopus. https://doi.org/10.11604/pamj.2021.38.181.19915

#### Abstract

#### Introduction

Incidence of adverse drug reactions (ADR) associated with antiretroviral therapy (ART) was higher in developing countries. In two teaching hospital in Ethiopia: Debremarkose 23% and Yirgalem 73.2% of study participants reported at least one ADR. Since there was limited information about ADR in the study area; we aimed to determine its incidence-rate and predictors.

# Methods

We conducted retrospective cohort study using medical records of HIV-infected patients enrolled on ART between 2006 and 2017 in government hospitals of Ethiopia. ADR was defined as report of at least one unwanted response to ART. We run descriptive and cox regression analysis (CRA).

# Results

Incidence-rate of ADR was 4.1 per 100 person-years (py). Hazards of ADR among patients living at rural was almost two times than at urban; [Adjusted hazard ratio (AHR): 1.94(95% (CI): 1.18, 3.20)]. Stavudine (D4T)-Lamivudine (3TC)-Nevirapine (NVP) had about two times [AHR: 1.78(95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 2.34 (95%CI: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had about two times [AHR: 1.03, 3.08)], Zidovudine(AZT)-3TC-NVP had

1.20, 4.57)], D4T-3TC-Efaviranze(EFV) had about three times [AHR: 2.86(95%CI: 1.38, 5.95)] and AZT-3TC-EFV had about two times [AHR: 2.16(95%CI: 1.21,3.90)] hazards of ADR than Tenofovir(TDF) based regimens. Being WHO clinical stage III had about two times hazard of ADR [AHR: 2.46 (95%CI: 1.22, 4.95)] and IV had about four times hazard of ADR [AHR: 4.32 (95%CI: 1.88, 9.93)] than stage I.

# Conclusion

Risk of ADR was higher among adult HIV-infected patients on ART living in rural, WHO clinical stage III and IV, and patients on AZT and D4T based regimen. AZT should not be given as an alternative treatment, increase access of TDF regimens.

Chala, A., Tadesse, B. T., Chaka, T. E., Mukonzo, J., Kitabi, E. N., Tadesse, S., Pohanka, A., Makonnen, E., & Aklillu, E. (2021). Predictors of efavirenz plasma exposure, auto-induction profile, and effect of pharmacogenetic variations among HIV-infected children in ethiopia: A prospective cohort study. *Journal of Personalized Medicine*, *11*(12). Scopus. https://doi.org/10.3390/jpm11121303

# Abstract

# Background

Efavirenz plasma concentration displays wide between-patient variability partly due to pharmacogenetic variation and autoinduction. Pediatric data on efavirenz pharmacokinetics and the relevance of pharmacogenetic variation are scarce, particularly from sub-Saharan Africa, where >90% of HIV-infected children live and population genetic diversity is extensive. We prospectively investigated the short-and long-term effects of efavirenz auto-induction on plasma drug exposure and the influence of pharmacogenetics among HIV-infected Ethiopian children. (2)

# Method

Treatment-naïve HIV-infected children aged 3–16 years old (n = 111) were enrolled prospectively to initiate efavirenz-based combination antiretroviral therapy (cART). Plasma efavirenz concentrations were quantified at 4, 8, 12, 24, and 48 weeks of cART. Genotyping for CYP2B6, CYP3A5, UGT2B7, ABCB1, and SLCO1B1 common functional variant alleles was performed. (3)

# Results

The efavirenz plasma concentration reached a peak at two months, declined by the 3rd month, and stabilized thereafter, with no significant difference in geometric mean over time. On average, one-fourth of the children had plasma efavirenz concentrations  $\geq 4 \ \mu g/mL$ . On multivariate analysis, CYP2B6\*6 and ABCB1c.3435 C > T genotypes and low pre-treatment low-density lipopro-tein (LDL) were significantly associated with higher plasma efavirenz concentration regardless of treatment duration. Duration of cART, sex, age, nutritional status, weight, and SLCO1B, CYP3A5, UGT2B7, and ABCB1 rs3842 genotypes were not significant predictors of efavirenz plasma exposure. (4)

# Conclusion

Pre-treatment LDL cholesterol and CYP2B6\*6 and ABCB1c.3435 C > T genotypes predict efavirenz plasma exposure among HIV-infected children, but treatment-duration-dependent changes in plasma efavirenz exposure due to auto-induction are not statistically significant.

Getaneh, T., Negesse, A., Dessie, G., Desta, M., Assemie, M. A., & Tigabu, A. (2021a). Predictors of malnutrition among pregnant women in Ethiopia: A systematic review and meta-analysis. *Human Nutrition and Metabolism*, 26. Scopus. https://doi.org/10.1016/j.hnm.2021.200131

# Abstract

#### Background

Reproductive aged women are especially vulnerable to protein energy deficiency and under nutrition. Malnutrition is the underlying cause of significant maternal morbidity and mortality. In addition, malnutrition among women is a major risk factor for adverse birth outcomes. Its extent and consequences is highly prevalent in developing countries. This major burden can be reduced through effective nutritional interventions. So, up to date meager evidences were warranted. Therefore, this systematic review and meta-analysis was aimed to estimate the overall pooled prevalence of malnutrition and its predictors among pregnant women in Ethiopia.

# Methods

Articles were systematically searched using PubMed, EMBASE, Google Scholar, World Health Organization's (WHO) Hinari portal data bases and institutional repositories. Newcastle– Ottawa quality assessment scale adapted for observational studies was applied. We used Stata version 14 for data analysis. Heterogeneity and publication bias were checked using I2 statistic, funnel plot asymmetry and Egger's test. Random effect model was applied to estimate the pooled prevalence of malnutrition and its predictors. Odds Ratio (OR) with 95% Confidence Interval (CI) was also considered to identify factors.

#### Result

Generally, 24 eligible articles were included for final analysis. The average pooled prevalence of malnutrition among pregnant women in Ethiopia was 29.07% (95% CI: 24.84, 33.30). Maternal illiteracy (OR = 1.60, 95% CI: 1.01, 2.53), low income (<1000 Ethiopian Birr) (OR = 3.07, 95% CI: 1.36, 6.92), unplanned pregnancy (OR = 1.33, 95% CI: 1.01, 1.37), number of meal &lt; three/day (OR = 4.63, 95% CI: 3.00, 7.15), poor dietary diversity (OR = 2.89, 95% CI: 1.28, 6.53), absence of antenatal care (OR = 2.53, 95% CI: 1.18, 5.42) and iron supplementation (OR = 0.63, 95% CI: 0.45, 0.88) were predictors of the pooled prevalence of malnutrition among pregnant women in Ethiopia.

# Conclusion

Significant number of pregnant women in Ethiopia were suffered from malnutrition. Maternal illiteracy education level, low income, unplanned pregnancy, low number of meal, poor dietary diversity, absence of antenatal care and iron supplementation were significant predictors of malnutrition. This meta-analysis suggests that global methods to improve girls' education, access to health care, and economic opportunities to reduce poverty will be needed to reduce burden of malnutrition.

Tsegaye, B., Shudura, E., Yoseph, A., & Tamiso, A. (2021). Predictors of skilled maternal health services utilizations: A case of rural women in Ethiopia. *PLoS ONE*, *16*(2 February 2021). Scopus. https://doi.org/10.1371/journal.pone.0246237

# Abstract

#### Background

Maternal health services are affected by complex factors from one setting to another. Consequently, health planners should prioritize different interventions and design appropriate programs to enhance maternal health services utilization. Results of prior studies are conflicting. Furthermore, only few studies were done from antenatal to postnatal continuum of care in Ethiopia. Objectives This study aimed to assess prevalence and predictors of skilled maternal health services utilization at Dale-Wonsho health and demographic surveillance site of the Hawassa University, South Ethiopia, in 2019.

# Methods

A community based cross sectional study was conducted from January 1-30; 2019. A total of 682 women who gave birth in the last twelve months were selected by using a two stage sampling technique. Data were collected through face to face interview. Data were entered into Epidata version 3.1. Then, they were exported and analyzed by SPSS version 22. Bi-variable logistic regression analysis was done and variables with p-value less than 0.05 were considered as candidate for multivariable logistic regression analysis. Adjusted Odds Ratios (AOR) with 95% CI were computed, and p-value less than 0.01 was computed to determine the level of significance.

# Result

Prevalence of antenatal care, institutional delivery and postnatal care utilizations were 69.1%, 52.1% and 32.7% respectively. Educated women (AOR = 4.72, 95%CI,2.82,7.9), household training (AOR = 8.52,95%CI = 5.5,13.1), middle wealth quantile(AOR = 0.8,95% CI,0.4-0.7), being richest wealth quantile (AOR = 0.16;95%CI = 0.06,0.41) and pregnancy plan (AOR = 3.65,95%CI,1.67-8.0) were factors positively associated with antenatal care utilization. Husband education (AOR = 4.96,95CI,3.08-8.0), and antenatal care (AOR = 5.9;95%CI,3.87,9.1) were factors associated with institutional delivery. Maternal education (AOR = 2.5,95CI,1.4-4.4), information about postnatal care service utilization (AOR = 3.6,95CI,2.1,6.2) and women autonomy(AOR = 6.1,95CI,3.8,9.7) were positively associated with postnatal care service. **Conclusion** 

Prevalence of antenatal care, institutional delivery and postnatal care services were lower than the targeted plan. Policy makers should focus on capacity building of women both economically and academically. So, women should be more autonomous to utilize health services effectively. Moreover, awareness creation among women should be enhanced about maternal health service.

Ayalew, M., Reta, Y., & Defar, S. (2021). Predictors of unrecognised comorbid depression in patients with schizophrenia at Amanuel mental specialized hospital, Ethiopia: A cross-sectional study. *BMJ Open*, *11*(9). Scopus. https://doi.org/10.1136/bmjopen-2021-049026

### Abstract

#### Background

The occurrence of depression in patients with schizophrenia (PWS) increases the risk of relapse, frequency and duration of hospitalisation, and decreases social and occupational functioning. Objective This study aimed to assess prevalence of unrecognised comorbid depression and its determinants in PWS.

# Method

A cross-sectional study was conducted from 1 to 30 March 2019 at Amanuel mental specialized hospital among 300 PWS. The 9-item Calgary Depression Scale for Schizophrenia was used to assess comorbid depression. Logistic regression was used to determine the association between outcome and explanatory variables. Statistical significance was declared at p value <0.05 with 95% CI.

#### Results

The prevalence of unrecognised comorbid depression was found to be 30.3%. Living alone (adjusted OR (AOR)=3.49, 95% CI=0.45 to 8.36), having poor (AOR=4.43, 95% CI=1.45 to 13.58) and moderate (AOR=4.45, 95% CI=1.30 to 15.22) social support, non-adherence to medication (AOR=3.82, 95% CI=1.70 to 8.55), presenting with current negative symptoms such as asocialia (AOR=4.33, 95% CI=1.98 to 9.45) and loss of personal motivation (AOR=3.46, 95% CI=1.53 to 7.84), and having suicidal behaviour (AOR=6.83, 95% CI=3.24 to 14.41) were the significant predictors of comorbid depression in PWS.

#### Conclusion

This study revealed considerably a high prevalence of unrecognised comorbid depression among PWS. Therefore, clinicians consider timely screening and treating of comorbid depression in PWS.

Sawle, Y., Jain, S., Babu, S., Nair, A. R., & Khan, B. (2021). Prefeasibility Economic and Sensitivity Assessment of Hybrid Renewable Energy System. *IEEE Access*, *9*, 28260–28271. Scopus. https://doi.org/10.1109/ACCESS.2021.3058517\_Conference

### Abstract

Nowadays, microgrids with hybrid renewable energy sources are increasing, and it is a promising solution to electrify remote areas where distribution network expansion is not feasible or economical. This study aims to find an ideal hybrid system grounded on solar, wind, diesel, biomass, hydro, and battery. This study utilizes the hybrid optimization model for electric renewable (HOMER) software to size the important components, perform technical, financial evaluation, renewable factor, estimate the harmful emissions, and sensitivity analysis. For optimum system selection, the lowest cost of energy is used as the criteria. Four different configurations of renewable energy sources are analyzed and found PV-WT-MH-CT-BT-DG-BG is the most feasible hybrid system amongst all configurations. The proposed PV-WT-MH-CT-BT-DG-BG hybrid system is more economic as the lowest cost of energy 0.196, low operating cost 36,184, low net present cost 831,217. Also, this hybrid system is more environmentally friendly as it has less emission and a high renewable factor of 81.2%.

Alano, A., Hanson, L., & Madda, M. (2021). Premises and rationale of contraceptive services accessing in southern Ethiopia: A phenomenological exploration. *Ethiopian Journal of Reproductive Health*, 13(2), 38–45. Scopus.

#### Abstract

# Background

Despite the encouraging engagements of stakeholders in contraceptives provision in Ethiopia, there was paucity of information on service providers' and users' experiences about the premises for accessing services. Therefore, the study was conducted to explore service providers' and user' s lived experiences under which premises the services are being given.

#### Methods

Interpretative phenomenological qualitative methodology was employed to explore the lived experiences of contraceptive services stakeholders. Data were collected using focus group discussions and key informant interviews. Data were analyzed using an interpretive phenomenological analysis framework including phases of data immersion, transcribing, coding, theme development, and phenomenological interpretation through hermeneutic circle. Results

The study captured enabling context for contraceptive service provision and use from various rationales, organization, and expansion of contraceptive services to the community and households. The findings indicated that contraceptive service provision from the demographic and socio-economic perspectives was understood adequately all in the positional hierarchies, but the human rights-based rationale was less obvious, except for higher level health leaders.

# Conclusion

The study concludes that the bigger picture premise for contraceptive services provision, the human right approach, remained elusive as one moves down the hierarchy in health care organizations. On the other hand, the demographic, economic, and health rationales are more obvious. Hence, the study recommends the disconnect in the broader premises of providing contraceptive services (the human rights approach) must properly be communicated to the lower-level stakeholders.

Astawesegn, F. H., Stulz, V., Agho, K. E., Mannan, H., Conroy, E., & Ogbo, F. A. (2021). Prenatal hiv test uptake and its associated factors for prevention of mother to child transmission of hiv in East Africa. *International Journal of Environmental Research and Public Health*, 18(10). Scopus. https://doi.org/10.3390/ijerph18105289

# Abstract

Identifying the socioeconomic and structural issues that act as enablers and/or barriers to HIV testing services is critical in combatting HIV/AIDS amongst mothers and children in Africa. In this study, we used a weighted sample of 46,645 women aged 15–49 who gave birth in the two years preceding the survey from the recent DHS dataset of ten East African countries. Multivariable logistic regression was used to investigate the factors associated with prenatal HIV test uptake in East Africa. The overall prenatal HIV test uptake for the prevention of mother-to-child transmission (PMTCT) of HIV was 80.8% (95% CI: 74.5–78.9%) in East Africa, with highest in Rwanda (97.9%, 95% CI: 97.2–98.3%) and lowest in Comoros (17.0%, 95% CI: 13.9–20.7%). Common factors associated with prenatal HIV test service uptake were higher maternal

education level (AOR = 1.29; 95% CI: 1.10–1.50 for primary education and AOR = 1.96; 95% CI: 1.53–2.51 for secondary or higher education), higher partner education level (AOR = 1.24; 95% CI: 1.06–1.45 for primary education and AOR = 1.56; 95% CI: 1.26–1.94 for secondary or higher school), women from higher household wealth index (AOR = 1.29; 95% CI: 1.11–1.50 for middle wealth index; AOR= 1.57; 95% CL: 1.17–2.11 for rich wealth index), improved maternal exposure to the media, and increased awareness about MTCT of HIV. However, residents living in rural communities (AOR=0.66; 95% CI: 0.51–0.85) and travelling long distances to the health facility (AOR = 0.8; 95% CI: 0.69–0.91) were associated with non-use of prenatal HIV test service in East African countries. In each East African country, factors associated with prenatal HIV test uptake for PMTCT of HIV was low in East Africa compared to the global target. Scaling up interventions to improve enablers whilst addressing barriers to the use of prenatal HIV test services are essential to end the HIV/AIDS epidemic in East African countries.

Duko, B., Pereira, G., Tait, R. J., Nyadanu, S. D., Betts, K., & Alati, R. (2021). Prenatal Tobacco Exposure and the Risk of Tobacco Smoking and Dependence in Offspring: A Systematic Review and Meta-Analysis. *Drug and Alcohol Dependence*, 227. Scopus. https://doi.org/10.1016/j.drugalcdep.2021.108993

# Abstract

#### Background

There is some compelling, though not comprehensive, epidemiological evidence which suggests an association between prenatal tobacco exposure and tobacco smoking/dependence in offspring. We conducted a systematic review and meta-analysis to identify the magnitude and consistency of associations reported between prenatal tobacco exposure and subsequent tobacco smoking/dependence in offspring.

### Methods

Using the PRISMA guideline, we systematically searched PubMed, SCOPUS, EMBASE and Psych-INFO to identify relevant studies. The methodological quality of all identified studies was checked by the Newcastle-Ottawa Scale. Inverse variance weighted random effects meta-analysis was used to estimate pooled risk ratio (RR) and 95 % confidence intervals (CI). We stratified outcomes by tobacco smoking initiation, lifetime tobacco smoking, current tobacco smoking and

tobacco dependence. We further performed subgroup and leave-one-out sensitivity analyses. The protocol of this review was registered in the PROSPERO.

# Results

Twenty-six cohort and one case-control study were included in the final meta-analysis. We found elevated pooled risks of tobacco smoking initiation [RR = 2.08, (95 % CI: 1.18–3.68)], ever tobacco smoking [RR = 1.21, (95 % CI: 1.05–1.38)], current tobacco smoking [RR = 1.70, (95 % CI: 1.48–1.95)] and tobacco dependence [RR = 1.50, (95 % CI: 1.31–1.73)] in offspring exposed to maternal prenatal tobacco use compared to non-exposed. We also noted higher risk estimate of current tobacco smoking in offspring exposed to heavy prenatal tobacco smoking [RR = 1.68, (95 % CI: 1.26–2.23)] when compared to prenatal exposure to lighter tobacco use [RR = 1.39, (95 % CI: 1.09–1.78)]. There was no association observed between paternal smoking during pregnancy and tobacco smoking in offspring.

#### Conclusion

Offspring exposed to maternal prenatal tobacco smoking are at an increased risk of tobacco smoking/dependence, indicating that tobacco smoking cessation during gestation may be imperative to reduce these risks in offspring.

Tsade, H., Anshebo, S. T., & Sabir, F. K. (2021). Preparation and Characterization of Functionalized Cellulose Nanomaterials (CNMs) for Pb(II) Ions Removal from Wastewater. *Journal of Chemistry*, 2021. Scopus. https://doi.org/10.1155/2021/5514853

# Abstract

Due to their remarkable properties, cellulose nanomaterials are emerging materials for wastewater (WW) treatment. In this study, both pristine cellulose nanomaterial (CNM) and sodium periodate modified cellulose nanomaterial (NaIO4-CNM) were prepared from the stem of the Erythrina brucei plant for the removal of Pb(II) ions from WW. As-prepared CNMs were characterized by X-ray diffraction (XRD), Fourier transform infrared (FT-IR), scanning electron microscope (SEM), and thermogravimetric analysis with differential thermogravimetry (TGA-DTG) analysis. The as-prepared and characterized CNMs were tested for the removal of Pb(II) ions from secondary run-off wastewater (SERWW). Langmuir and Freundlich adsorption isotherms were certainly fixed to a maximum Pb(II) ions uptake capability (Qmax) of 91.74 and 384.62 mg g-1 by CNM and NaIO4-CNM adsorbents, respectively. The pseudo-second-order (PSO) kinetics

model was well fitted to the uptake process. Results revealed that the percentage removal (%R) of Pb(II) ions was decreased by the presence of nitrogen and organic matter, but not affected by the presence of phosphorous in SERWW. Due to its high efficiency, NaIO4-CNM was selected for the regeneration study. The regeneration study was conducted after desorption of Pb(II) ions from the adsorbent by the addition of HCl, and the regenerated sorbent was reused as an adsorbent for at least 13 successive cycles. The results indicated excellent recycling capabilities, and the adsorbent was used as adsorbing material for the removal of Pb(II) ions from SERWW after 13 successive cycles without significant efficient loss.

Minckas, N., Medvedev, M. M., Adejuyigbe, E. A., Brotherton, H., Chellani, H., Estifanos, A. S., Ezeaka, C., Gobezayehu, A. G., Irimu, G., Kawaza, K., Kumar, V., Massawe, A., Mazumder, S., Mambule, I., Medhanyie, A. A., Molyneux, E. M., Newton, S., Salim, N., Tadele, H., ... Lawn, J. E. (2021). Preterm care during the COVID-19 pandemic: A comparative risk analysis of neonatal deaths averted by kangaroo mother care versus mortality due to SARS-CoV-2 infection. *EClinicalMedicine*, 33. Scopus. https://doi.org/10.1016/j.eclinm.2021.100733

# Abstract

#### Background

COVID-19 is disrupting health services for mothers and newborns, particularly in low- and middle-income countries (LMIC). Preterm newborns are particularly vulnerable. We undertook analyses of the benefits of kangaroo mother care (KMC) on survival among neonates weighing  $\leq$ 2000 g compared with the risk of SARS-CoV-2 acquired from infected mothers/caregivers.

# Methods

We modelled two scenarios over 12 months. Scenario 1 compared the survival benefits of KMC with universal coverage (99%) and mortality risk due to COVID-19. Scenario 2 estimated incremental deaths from reduced coverage and complete disruption of KMC. Projections were based on the most recent data for 127 LMICs (~90% of global births), with results aggregated into five regions.

# Findings

Our worst-case scenario (100% transmission) could result in 1,950 neonatal deaths from COVID-19. Conversely, 125,680 neonatal lives could be saved with universal KMC coverage. Hence, the benefit of KMC is 65-fold higher than the mortality risk of COVID-19. If recent evidence of 10% transmission was applied, the ratio would be 630-fold. We estimated a 50% reduction in KMC coverage could result in 12,570 incremental deaths and full disruption could result in 25,140 incremental deaths, representing a  $2 \cdot 3 - 4 \cdot 6\%$  increase in neonatal mortality across the 127 countries.

# Interpretation

The survival benefit of KMC far outweighs the small risk of death due to COVID-19. Preterm newborns are at risk, especially in LMICs where the consequences of disruptions are substantial. Policymakers and healthcare professionals need to protect services and ensure clearer messaging to keep mothers and newborns together, even if the mother is SARS-CoV-2-positive.

# Funding

Eunice Kennedy Shriver National Institute of Child Health & Human Development; Bill & Melinda Gates Foundation; Elma Philanthropies; Wellcome Trust; and Joint Global Health Trials scheme of Department of Health and Social Care, Department for International Development, Medical Research Council, and Wellcome Trust.

Ayalew, M., Deribe, B., Abraham, Y., Reta, Y., Tadesse, F., Defar, S., Hoyiso, D., & Ashegu, T. (2021). Prevalence and determinant factors of mental health problems among healthcare professionals during COVID-19 pandemic in southern Ethiopia: Multicentre cross-sectional study. *BMJ Open*, *11*(12), e057708. Scopus. https://doi.org/10.1136/bmjopen-2021-057708

# Abstract

# Objective

To assess the prevalence of depression, anxiety and stress and its determinant factors during COVID-19 pandemic among healthcare professionals in southern Ethiopia. DESIGN: Multi-centre cross-sectional study.

# **Setting and Study Period**

Randomly selected public hospitals in Sidama, southern Ethiopia between 25 September 2020 and 25 October 2020. PARTICIPANTS: 387 healthcare professionals were randomly selected. OUTCOME MEASURESPrevalence and determinant factors of depression, anxiety and stress was assessed.

# RESULT

Depression, anxiety and stress prevalence were shown to be 50.1% (95% confidence interval (CI) 45.0% to 55.0%), 55.0% (95% CI 51.1% to 59.9%) and 38.5% (95% CI 33.6% to 43.2%), respectively. Being female (adjusted odd ratio (AOR) 3.71, 95% CI 2.31 to 5.97), married (AOR 2.28, 95% CI 1.34 to 3.86), living alone (AOR 1.87, 95% CI 1.09 to 3.20), nurses (AOR 2.94, 95% CI 1.44 to 5.99) and working in inpatients (AOR 0.53, 95% CI 0.29 to 0.93) were significantly associated with depressive symptoms. Moreover, older age groups (AOR 3.15, 95% CI 1.04 to 6.56), females (AOR 3.25, 95% CI 2.01 to 5.25), married (AOR 1.69, 95% CI 1.01 to 2.87) and nurses (AOR 3.32, 95% CI 1.63 to 6.78) were significantly associated with symptoms of anxiety. Stress symptoms were significantly high among females (AOR 2.47, 95% CI 1.53 to 3.97), married (AOR 2.77, 95% CI 1.60 to 4.78), living alone (AOR 2.01, 95% CI 1.15 to 3.52), nurses (AOR 2.34, 95% CI 1.11 to 4.92) and working in units other than emergency (inpatient (AOR 0.32, 95% CI 0.18 to 0.57) and other units (AOR 0.48, 95% CI 0.25 to 0.95)).

# Conclusion

The current study found that healthcare professionals have high levels of depression, anxiety and stress symptoms. Sex, age, marital status, type of profession, living status and working environment were significant factors for mental health problems in healthcare professionals during the pandemic. Healthcare professionals require mental health support at which monitoring and control can be performed during and after the pandemic.

Bedaso, A., Adams, J., Peng, W., & Sibbritt, D. (2021a). Correction to: Prevalence and determinants of low social support during pregnancy among Australian women: A community-based cross-sectional study (Reproductive Health, (2021), 18, 1, (158), 10.1186/s12978-021-01210-y). *Reproductive Health*, 18(1). Scopus. https://doi.org/10.1186/s12978-021-01231-7

# Abstract

#### Background

Pregnancy is a time for women in which the need for social support is crucial. Social support reduces stressors and improves the emotional and physical well-being of pregnant women. Women receiving low social support during pregnancy are at risk of substances use, developing mental

illness, and adverse birth outcomes. The current study aims to determine the prevalence and determinants of low social support during pregnancy among Australian women.

# Methods

Data were obtained from the 1973-1978 cohort of Australian Longitudinal Study on Women's Health (ALSWH) and those who report being pregnant (n = 493) were included in the current analyses. Social support was assessed using Medical Outcomes Study Social Support index (MOSS). A logistic regression model was applied to identify determinants of low social support, separately for each MOSS domain.

# Result

The study found that 7.1% (n = 35) of pregnant women reported low social support. Significant determinants of low emotional support were non-partnered (AOR = 4.4, 95% CI: 1.27, 14.99), difficulty managing on available income (AOR = 3.1, 95% CI: 1.18, 8.32), experiencing depressive symptoms (AOR = 8.5, 95% CI: 3.29, 22.27) and anxiety symptoms (AOR = 2.9, 95% CI: 1.26, 7.03). Significant determinants of low affectionate support were suffering from depressive symptoms (AOR = 5.3, 95% CI: 1.59, 17.99), having anxiety symptoms (AOR: 6.9, 95% CI: 2.21, 22.11) and being moderately/very stressed (AOR: 3, 95% CI: 1.17, 7.89). Significant determinants of low tangible support were difficulty managing available income (AOR = 3, 95% CI: 1.29, 6.95), and being depressed (AOR = 2.8, 95% CI: 1.48, 5.34).

# Conclusion

The study revealed that 7.1% of pregnant women reported low social support. Having a mental health problems, being stressed, being from low socio-economic status and being non-partnered were significant determinants of low social support during pregnancy. Maternal health professionals and policymakers can use this information to screen pregnant women at risk of receiving low social support and improve the level of support being provided.

Tsegaye, B., Amare, B., & Reda, M. (2021). Prevalence and factors associated with immediate postnatal care utilization in ethiopia: Analysis of Ethiopian demographic health survey 2016. *International Journal of Women's Health*, 13, 257–266. Scopus. https://doi.org/10.2147/IJWH.S294058

# Abstract

#### Background

Maternal mortality is unacceptably high in Ethiopia. Most maternal complications are preventable using immediate postnatal care. However, it is not utilized effec-tively. Hence, this study can assist in formulation of national policies to increase use of immediate postnatal care in Ethiopia. Objective: To assess the prevalence and factors associated with immediate postnatal care utilization in Ethiopia, in 2016.

#### Methods

Secondary data analysis was done on Ethiopian Demographic Health Survey 2016 data, in a stratified, two-stage, and cluster sampling study. This analysis was restricted to postnatal women who had given birth at least once in the five years before the survey. Chi-square test of statistics was performed to identify factors associated with immediate postnatal care service uptake. Bi-variable and multi-variable logistic regression analyses were carried out to identify factors associated with immediate postnatal care level was computed and P-value < 0.05 was considered as statistically significant in the multivariable logistic regression.

#### **Results**

The overall level of immediate postnatal care service utilization was 6.3% in Ethiopia. Urban setting (AOR=2.3, 95% CI, 1.9, 2.9), higher education status (AOR=1.6, 95% CI, 1.3, 2.0), secondary education status (AOR=2.6, 95% CI, 1.9, 3.6), primary education status (AOR=3.1, 95% CI 2.0, 4.6), always listening to the radio (AOR=2.4, 95% CI, 1.7, 3.2), being in a richer wealth quintile (AOR=4.2, 95% CI, 3.0, 5.8), being in a middle wealth quintile (AOR=2.8, 95% CI, 2.0, 3.9), being in a poorer wealth quintile (AOR=1.9, 95% CI, 1.3, 2.8), having fewer than six children (AOR=1.3, 95% CI, 1.1, 2.0), and being told about pregnancy complications (AOR=2.2, 95% CI, 1.7, 2.7) were factors positively associated with utilization of immediate postnatal care.

# Conclusion

Prevalence of immediate postnatal care utilization is still low in Ethiopia. Awareness should be created about immediate postnatal care utilization through the efforts of health extension workers. In addition, the Ethiopian government should design strategies to enhance the socio-economic status of women. Beside these, information about postnatal care and its benefit is critical and can be transmitted through mass media.

Debelo, M., Abdela, H., Tesfaye, A., Tiruneh, A., Mekonnen, G., Asefa, Z., & Moje, N. (2021). Prevalence of Bovine Rotavirus and Coronavirus in Neonatal Calves in Dairy Farms of Addis Ababa, Ethiopia: Preliminary Study. *BioMed Research International*, 2021. Scopus. https://doi.org/10.1155/2021/5778455 Abstract

#### Background

Bovine rotavirus (BRV) and bovine coronavirus (BCoV) are the most common vir al agents in neonatal calf diarrhea and result in serious economic consequences. The aim of the study was to determine the epidemiology of those viruses in randomly selected dairy farms of Addis Ababa.

#### Methods

A cross-sectional study was conducted from November 2018 to April 2019 using a probability proportional to size (PPS) sampling technique. A total of 110 calves, less than 30 days of age, from 57 dairy herds were involved in the study. Associated factors of herds and calves were collected using semistructured interviews from farm owners and through physical observation of selected calves. Fecal samples were collected and analyzed using the sandwich ELISA method. Data generated from both semistructured interviews and laboratory investigation were analyzed using STATA\_MP version 15.

#### Results

From the total 110 calves, 42 (38.18%) had diarrhea during the survey. The prevalence of bovine rotavirus and coronavirus was 3.64% (4/110) and 0.91% (1/110), respectively. Diarrhea, feeding colostrum timing, and sex of the neonatal calves had statistically significant association with bovine rotavirus infection (p<0.05). All rotavirus-positive neonatal calves were identified in small scale dairy farms and in dairy farms that reported mortality though they lack statistically significant association. Only one coronavirus case was detected among the neonatal calves. The case was

identified among small scale herds and in a herd with diarrheal cases. The sex of the coronavirus calf was female, diarrheic, and among 11-20 days old.

# Conclusion

The prevalence of rotavirus and coronavirus infections in neonatal calves was seldom in dairy farms of the study area. Rotavirus was more common than coronavirus, and further studies should be initiated on other (infectious and noninfectious) causes of neonatal calf diarrhea in the area.

# Duko, B., Wolka, S., Seyoum, M., & Tantu, T. (2021). Prevalence of depression among women with obstetric fistula in low-income African countries: A systematic review and metaanalysis. *Archives of Women's Mental Health*, 24(1). Scopus. https://doi.org/10.1007/s00737-020-01028-w

#### Abstract

Depression is one of mental health consequences that present in women with obstetric fistula. It is estimated that over 264 million people of all ages suffer from depression globally. The objective of this systematic review and meta-analysis was to synthesize the epidemiologic evidence from previous studies on the prevalence of depression among women with obstetric fistula in lowincome African countries. We followed the preferred reporting items for systematic review and meta-analysis (PRISMA) guidelines to conduct this meta-analysis. The common databases (PubMed, SCOPUS, EMBASE, Psych INFO, Google Scholar, African Index Medicus, and African Journals Online (AJOL)) were searched for the relevant literature. We used a randomeffect meta-analysis model to estimate the overall prevalence of depression and the Q -and I2 statistics were used to assess the heterogeneity between the studies included in the meta-analysis. Egger's test and visual inspection of the symmetry in funnel plots were used to check for the presence of publication bias. The pooled estimated prevalence of depression among women with obstetric fistula in low-income African countries was 56.2% (95% CI 43.1-68.4). The prevalence of depression among women with obstetric fistula was 74.4% in Ethiopia, 72.9% in Kenya, 46.0% in Malawi, 41.0% in Sudan, 34.8% in Nigeria, and 27.7% in Tanzania. Furthermore, the prevalence of depression was higher (97.0%) when it was measured by using Beck's Depression Inventory (BDI) when compared with Patient Health Questionnaire (PHQ9) (62.7%), General Health Questionnaire (GHQ-28) (36.7%), Hamilton Depression Rating Scale (HDRS) (41.0%), and Center for Epidemiologic Studies Depression Scale (CES-D) (27.7%). Moreover, the pooled estimated prevalence of depression among women with obstetric fistula was ranged from 48.1 to 57.7% in a leave-one-out sensitivity analysis. The prevalence of depression among women with obstetric fistula in low-income African countries was high. Screening and appropriate management of depression among women with obstetric fistula are warranted.

Tadese, M., Kassa, A., Muluneh, A. A., & Altaye, G. (2021). Prevalence of dysmenorrhoea, associated risk factors and its relationship with academic performance among graduating female university students in Ethiopia: A cross-sectional study. *BMJ Open*, *11*(3). Scopus. https://doi.org/10.1136/bmjopen-2020-043814

#### Abstract

# **Objectives**

The study aimed to provide an association between dysmenorrhoea and academic performance among university students in Ethiopia. Further, the study attempts to determine the prevalence and associated risk factors of dysmenorrhoea.

### **Design and method**

Institution-based cross-sectional study was conducted from 1 April to 28 April 2019. A semistructured and pretested self-administered questionnaire was used to collect data. Binary logistic regression analysis and one-way analysis of variance were performed to model dysmenorrhoea and academic performance, respectively. Setting and participants Ethiopia (2019: n=647 female university students).

# Outcomes

The primary outcome is dysmenorrhoea, which has been defined as painful menses that prevents normal activity and requires medication. The self-reported cumulative grade point average of students was used as a proxy measure of academic performance, which is the secondary outcome.

# Results

The prevalence of dysmenorrhoea was 317 (51.5%). The educational status of father (adjusted OR (AOR) (95% CI) 2.64 (1.04 to 6.66)), chocolate consumption (AOR (95% CI) 3.39 (95% 1.28 to 8.93)), daily breakfast intake (<5 days/week) (AOR (95% CI) 0.63 (0.42 to 0.95)), irregular

menstrual cycle AOR (95% CI) 2.34 (1.55 to 3.54)) and positive family history of dysmenorrhoea AOR (95% CI) 3.29 (2.25 to 4.81)) had statistically significant association with dysmenorrhoea. There was no statistically significant difference in academic performance among students with and without dysmenorrhoea (F (3611)=1.276, p=0.28)).

# Conclusions

Dysmenorrhoea was a common health problem among graduating University students. However, it has no statistically significant impact on academic performance. Reproductive health officers should educate and undermine the negative academic consequences of dysmenorrhoea to reduce the physical and psychological stress that happens to females and their families.

# Gebre, G. G., & Rahut, D. B. (2021). Prevalence of household food insecurity in East Africa: Linking food access with climate vulnerability. *Climate Risk Management*, 33. Scopus. https://doi.org/10.1016/j.crm.2021.100333

### Abstract

The prevalence of food insecurity is much higher in East Africa than in other parts of the world. Climate change and associated variability are important contributors to food insecurity in the region. Using primary data collected in 2018/19 from Ethiopia, Kenya and Tanzania, this study examines the links between the prevalence of household food insecurity (the access to food dimension) and vulnerability to climate change in East Africa. The Household Food Insecurity Access Scale (HFIAS) was constructed to measure the prevalence of household food insecurity, and an ordered probit econometrics model was used to investigate the factors affecting the prevalence rates. The aggregate results show that 52% of the total sampled households in the region were food-secure; 15% and 26% were mildly food-secure and moderately food-insecure, respectively; and the remaining 7% were severely food-insecure. The ordered probit results suggest that exposure to climate change extremes and crop losses caused by these extremes significantly contribute to the prevalence of food insecurity across countries in East Africa. The results also indicate that households' adaptive capacity plays a significant role in reducing the prevalence of food insecurity. The demographic/human, social, financial, physical, and natural assets/capital of the household also play a significant role in reducing household-level food insecurity in Ethiopia, Kenya, and Tanzania.

Kumma, W. P., Lindtjørn, B., & Loha, E. (2021). Prevalence of hypertension, and related factors among adults in Wolaita, southern Ethiopia: A community-based cross-sectional study. *PLoS ONE*, *16*(12 December). Scopus. https://doi.org/10.1371/journal.pone.0260403

# Abstract

#### Introduction

Hypertension is a global public health challenge. There is a lack of evidence on the prevalence of hypertension, prehypertension, and related factors among adult populations of Wolaita, southern Ethiopia. Aim To assess the prevalence of hypertension, prehypertension, and related factors among adult populations of Wolaita, southern Ethiopia.

# Methods

A community-based cross-sectional study was conducted on 2483 adult residents, selected using a two-stage random sampling technique. The quantitative data collected from structured questionnaires; anthropometric and biochemical measurements were entered into EpiData version 3.1 using double-entry systems. We determined the weighted prevalence of hypertension and prehypertension for the two-stage survey. The multivariate logistic regression analysis was used to assess factors associated with hypertension and carried out after declaring the data set as survey data to account for the effect of clustering. An adjusted coefficient with 95% CI was used to ascertain the significance of the association.

### **Results**

The weighted prevalence of hypertension and prehypertension in the Wolaita area was 31.3% (27.7%-35.1%) and 46.4% (42.9%-50.0%) respectively. The weighted prevalence of hypertension of those who were not aware of their hypertension until the time of the survey was 29.8%% (26.5%-33.3%). Where the weighted prevalence of self-reported cases of hypertension was 2.2% (1.2%-3.8%). Obesity, sugar-sweetened food consumption, male sex, elevated total cholesterol, raised fasting blood sugar, and advancing age were positively associated with hypertension.

# Conclusion

The prevalence of hypertension among adults in Wolaita was high. A small proportion of the affected people are aware of their high blood pressure. This study reported a high prevalence of pre-hypertension; which indicates a high percentage of people at risk of hypertension. It is essential

to develop periodic screening programs, and primary intervention strategies such as the prevention of obesity, and reduction of sugar-sweetened food consumption.

Bitew, Z. W., Alemu, A., Tenaw, Z., Alebel, A., Worku, T., & Ayele, E. G. (2021). Prevalence of metabolic syndrome among children and adolescents in high-income countries: A systematic review and meta-analysis of observational studies. *BioMed Research International*, 2021. Scopus. https://doi.org/10.1155/2021/6661457

# Abstract

#### Introduction

Metabolic syndrome (MetS) is an assemblage of interconnected cardiovascular risk factors that are prevalent among children and adolescents in high-income countries (HICs). Despite the presence of several studies on the issue, the study findings are incongruent due to the absence of a gold standard diagnostic method of MetS in children. Thus, the findings of the original studies are inconclusive for policy makers and other stakeholders. This systematic review and meta-analysis is aimed at giving conclusive evidence about MetS among children and adolescents in HICs.

# Methods

We conducted searches using electronic databases (PubMed, Scopus, Web of Science, CINAHL (EBSCOhost), EMBASE (Elsevier), and Medline (EBSCOhost)) and other sources (Google Scholar and Google) up to September 2020. Observational studies reporting the prevalence of MetS were eligible in this study. The pooled estimates were computed in fixed and random effect models using six diagnostic methods (IDF, ATP III, de Ferranti et al., WHO, Weiss et al., and Cruz and Goran). Publication bias was verified using funnel plots and Egger's regression tests. Subgroup and sensitivity analysis were performed in case of higher heterogeneities among the included studies.

#### Result

In this study, 77 studies with a total population of 125,445 children and adolescents were used in the final analysis. Metabolic syndrome among the overweight and obese population was computed from 28 studies with the pooled prevalence of 25.25%, 24.47%, 39.41%, 29.52%, and 33.36% in IDF, ATP III, de Ferranti et al., WHO, and Weiss et al. criteria, respectively. Likewise, 49 studies were eligible to compute the pooled prevalence of MetS in the general population of children and

adolescents. Hence, MetS was found in 3.70% (IDF), 5.40% (ATP III), 14.78% (de Ferranti et al.), 3.90% (WHO), and, 4.66% (Cruz and Goran) of study participants. Regarding the components of MetS, abdominal obesity in the overweight and obese population, and low HDL-C in the general population were the most common components. Besides, the prevalence of Mets among males was higher than females.

# Conclusion

This study demonstrates that MetS among children and adolescents is undoubtedly high in HICs. The prevalence of MetS is higher among males than females. Community-based social and behavioral change communications need to be designed to promote healthy eating behaviors and physical activities. Prospective cohort studies could also help to explore all possible risk factors of MetS and to design specific interventions accordingly.

Oltaye, Z., Geja, E., & Tadele, A. (2021). Prevalence of motorcycle accidents and its associated factors among road traffic accident patients in hawassa university comprehensive specialized hospital, 2019. *Open Access Emergency Medicine*, 13, 213–220. Scopus. https://doi.org/10.2147/OAEM.S291510

# Abstract

#### Background

Road traffic damages were amongst the central causes of passing away, hospi-talization, disability, and low socioeconomic status. About 1.3 million lethal road traffic damages and 20–50 million nonfatal damages happened consequently of road traffic accidents every year globally. Motorcycles are a small subsection of all motor vehicles significantly over-represented in total motor vehicle accidents and lead to a great rate of deaths and disabilities.

# Objective

The study aimed to assess the prevalence of motorcycle accident and associated factors among road traffic accident patients in Hawassa University Comprehensive Specialized Hospital, Hawassa city, Ethiopia in 2019.

# **Methods and Materials**

The health institution/hospital-based retrospective cross-sectional study design was applied and a systematic random sampling technique was implemented to select the sample size of 274 patient's cards from January 2018 to January 2019. The data were entered and analyzed on SPSS 20. Results: From 274 patients' medical records reviewed in the study period, 151 (55.1%) injuries were due to motorcycle accident. In a multiple logistic regression analysis, age, sex, high speed, and types of roads showed significant association with motorcycle accidents.

# Conclusion

The prevalence of motorcycle accidents was the main cause of injuries among others, which was 55.1%. Motorcycle accidents occurred mainly in males and in people with the age category of 20–29 years. Age, sex, high speed, and type of road were significantly associated with a motorcycle accident.

Alemayehu, T. (2021). Prevalence of multidrug-resistant bacteria in Ethiopia: A systematic review and meta-analysis. *Journal of Global Antimicrobial Resistance*, *26*, 133–139. Scopus. https://doi.org/10.1016/j.jgar.2021.05.017

# Abstract

# **Objectives**

Multidrug-resistant (MDR) bacteria are a significant public-health threat worldwide, especially in low- and middle-income countries. Comprehensive data are important to understand the magnitude of multidrug resistance (MDR), however these are not available in Ethiopia.

# Methods

Five electronic databases and grey literature of Addis Ababa University Repository were searched for data regarding the prevalence of MDR bacteria in Ethiopia. OpenMetaAnalyst R1.3 was used for analysis using a random-effects model to determine the effect size. Heterogeneity among articles was checked using the inconsistency index (I2). Funnel plot was used to check for publication bias. The quality of each article was checked using the Newcastle–Ottawa checklist adapted for cross-sectional studies.

# Results

Through database searching, 2094 articles were identified, of which 37 fulfilled the study inclusion criteria. This review comprises 6856 bacteria, of which 4949 isolates were MDR. The overall

pooled prevalence of MDR was 70.5% (95% CI 64.9–76.1%), with considerable heterogeneity (I2 = 97.48%, P < 0.001). Funnel plot revealed no publication bias. Sidama (81.7%) had the highest MDR and Tigray (51.1%) the lowest. The greatest source of MDR was from multiple sites of infection (MSI) (76.8%); the least was from bloodstream infections (62.9%). MDR was higher in studies conducted on hospital-acquired infections (72.1%) compared with both hospital- and community-acquired infections (69.8%).

# Conclusion

Our study indicates a high prevalence of MDR in Ethiopia. Sidama region, MSI and hospitalacquired infections showed the highest MDR in subgroup analysis. Regional hospitals should implement infection prevention and proper use of antibiotics in the community.

Awol, R. N., Reda, D. Y., & Gidebo, D. D. (2021). Prevalence of Salmonella enterica serovar Typhi infection, its associated factors and antimicrobial susceptibility patterns among febrile patients at Adare general hospital, Hawassa, southern Ethiopia. *BMC Infectious Diseases*, 21(1). Scopus. https://doi.org/10.1186/s12879-020-05726-9

# Abstract

#### Background

Salmonellas enterica serovar Typhi (S.typhi) causes typhoid fever and is a global health problem, especially in developing countries like Ethiopia. But there is a little information about prevalence and factors association with S.typhi and its antimicrobial susceptibility pattern in Ethiopia especially in the study area. The aim of this study was to determine the prevalence of S.typhi infection, its associated factors and antimicrobial susceptibility pattern among patient with a febrile illness at Adare General Hospital, Hawassa, Southern Ethiopia.

# Methods

Hospital based cross sectional study was conducted among 422 febrile patients from May 23, 2018 to October 20, 2018. A 5 ml venous blood was collected from each febrile patient. Culture and biochemical test were performed for each isolate. Antimicrobial susceptibility testing was performed for each isolate using modified Kirby-Bauer disk diffusion techniques.

#### Result

In this study, the prevalence of S.typhi among febrile illness patients at Adare General Hospital was 1.6% [95% confidence interval (CI): 0.5–2.9]. The age of the study subjects were ranged from

15 to 65 years (mean age 32 years). It was observed that participants who came from rural area had 8 times (AOR 8.27: 95% CI: 1.33, 51.55) more likely to had S. typhi infection when compared with urban dwellers. The microbial susceptibility testing revealed that all six of S.typhi isolates showed sensitive to Ceftriaxone and all 6 isolates showed resistant to nalidixic acid and Cefotaxime and 5(83.3%) susceptible to Chloramphenicol and Ciprofloxaciline. Multidrug resistance (resistance to three or more antibiotics) was observed among most of the isolates.

# Conclusion

S. typhi bacteraemia is an uncommon but important cause of febrile illness in our study population. Ceftriaxone therapy is a suitable empirical antibiotic for those that are unwell and suspected of having this illness. Further surveillance is required to monitor possible hanging antibiotic resistant patterns in Ethiopia.

Hussen, S., Assegu, D., Tadesse, B. T., & Shimelis, T. (2021). Prevalence of Schistosoma mansoni infection in Ethiopia: A systematic review and meta-analysis. *Tropical Diseases, Travel Medicine and Vaccines*, 7(1). Scopus. https://doi.org/10.1186/s40794-020-00127-x

# Abstract

# Background

Schistosomiasis is a common helminthic infection in the tropics and subtropics, particularly in sub-Saharan African countries including Ethiopia. In these counties, Schistosoma mansoni infection is a significant public health problem due to the risk of reinfection and recurrent disease despite implementing several rounds preventive chemotherapy. This systematic review and meta-analysis aimed at assessing the pooled prevalence of schistosomiasis in Ethiopia.

# Methods

The PRISMA guidelines were followed to perform the systematic review and meta-analysis. Published studies from January 1999 to June 2020 were searched in Medline, PubMed, Google Scholar, EMBASE, HINARI, and Cochrane Library using key words including: "prevalence", "incidence", "schistosomiasis" "Bilharziasis", "Bilharzia", "S. mansoni ", "Ethiopia". Heterogeneity of included studies was assessed using Cochran's Q test and I2 test statistics while publication bias was assessed using Egger's test.

# Results

Ninety-four studies were included in the systematic review and meta-analysis. The pooled prevalence of S. mansoni in Ethiopia was 18.0% (95%CI: 14.0–23.0). The southern region of Ethiopia had a higher S. mansoni prevalence of 25.9% (995% CI, 14.9–41.1) than the national prevalence. The burden of S. mansoni infection was also higher than the national average in rural areas and among men with pooled prevalence of 20.2% (95% CI, 13.2–28.5) and 28.5% (95%CI, 22.7,35.1), respectively. The trend analysis showed that the prevalence of S. mansoni infection in Ethiopia decreased over the past 15 years, potentially because of the repeated preventive chemotherapy.

# Conclusion

The review unveiled a moderate prevalence of S. mansoni infection in Ethiopia. Targeted treatment of at-risk population groups ad high burden areas coupled with implementation of integrated vector control strategies are critical to address the burden of Schistosomiasis.

Getaneh, T., Negesse, A., Dessie, G., Desta, M., & Tigabu, A. (2021c). Prevalence of Urinary Tract Infection and Its Associated Factors among Pregnant Women in Ethiopia: A Systematic Review and Meta-Analysis. *BioMed Research International*, 2021. Scopus. https://doi.org/10.1155/2021/6551526

# Abstract

# Objective

Urinary tract infection (UTI) is the most common bacterial infections during pregnancy. It is associated with different maternal and neonatal adverse outcomes such as low birth weight, preterm birth, still birth, preeclampsia, maternal anemia, sepsis, and amnionitis, even when the infection is asymptomatic. However, in Ethiopia, it is represented with fragmented and inconclusive pocket studies. Therefore, this systematic review and meta-analysis is aimed at estimating the pooled prevalence of UTI and its associated factors among pregnant women in Ethiopia.

# Methods

PubMed/Medline, Embase, Cochrane Library, Google Scholar, and local sources were used to access eligible studies. Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument was applied for critical appraisal. Heterogeneity and publication bias were evaluated using I2 statistic, funnel plot asymmetry, and Egger's tests. Random effect model was employed to estimate the pooled burden of UTI and its associated factors among pregnant women with its corresponding odds ratio (OR) and 95% confidence interval (CI).

# Result

From all systematically searched articles, 14 studies were eligible for this analysis. The overall pooled prevalence of UTI among pregnant women in Ethiopia was 15.37% (95% CI: 12.54, 18.19). Family monthly income (OR=3.8 and 95% CI: 1.29, 11.23), parity (OR=1.59 and 95% CI: 1.01, 2.50), history of catheterization (OR=2.76 and 95% CI: 1.31, 5.84), and history of UTI (OR=3.12 and 95% CI: 1.74, 5.60) were factors significantly associated with UTI among pregnant women in Ethiopia.

# Conclusion

The overall pooled estimate of UTI among pregnant women in Ethiopia was higher compared with CDC estimation which was 8%. Family monthly income<1000ETB, multipara, previous history of catheterization, and history of UTI were factors increased burden of UTI during pregnancy. So, strategies targeting in economic reforms, universal access of family planning, and standardized prenatal care service should be addressed to alleviate this high prevalence of UTI during pregnancy.

Fekadu, A., Dobo, B., & Birmeka, M. (2021). Prevalence of, and risk factors for, malaria infection among patients visiting Goljota Health Center, Heben Arsi District, West Arsi Zone, Oromia Regional State, Ethiopia: A retrospective and an institution-based cross-sectional study. *Ethiopian Journal of Health Development*, 35(1), 50–57. Scopus.

# Abstract

## Background

Malaria infections in Ethiopia are a significant health problem that varies across regions. Malaria's public health and socio-economic impact is huge and contributes significantly to the country's

poverty and underdevelopment. The aim of this study was to determine the five-year trend of malaria (2012-2016), and to assess the prevalence and associated risk factors of malaria infection among patients visiting Goljota Health Center from September to December 2017.

# Methods

The present study is a retrospective and an institution-based cross-sectional study on the prevalence of malaria. For the cross-sectional study, blood samples collected from 422 patients were processed using thin and thick blood film methods. Also, five years of retrospective data were collected to determine the trend of malaria prevalence. Socio-demographic factors were assessed and logistic regression analyses were employed to determine the independent risk factors for malaria infection.

# Results

The prevalence of malaria was 14.8% in 2012, 21.4% in 2013, 14.2% in 2014, 12.9% in 2015 and 13.2% in 2016. The majority of malaria positives were male, with Plasmodium vivax accounting for most infections. The highest number of infections were in the  $\leq$ 10-year-old age group. The overall prevalence of malaria infection in the cross-sectional study was 13% in Heben Arsi Woreda (District). Being male (AOR 1.5, 95% CI: 1.06-2.2, p<0.02), using bed nets when sleeping (AOR 0.36, 95% CI: 0.22-0.60, p<0.01), implementing indoor residual spraying in the past five months (AOR 0.06, 95% CI: 0.03-0.10, p<0.01), home not close to breeding site (AOR 0.54, 95% CI: 0.29-0.98, p<0.04), and the absence of an opening/hole in an external house wall (AOR 0.49, 95% CI: 0.27-0.92, p=0.026) showed a negative significant association with malaria infection. So, these factors are protective in relation to malaria infection. Using thatched roof material (AOR 1.64, 95% CI: 1.0-2.7, p<0.02) and having an income of <500 Ethiopian birr per month (AOR 3.1, 95% CI: 1.24-7.9, p=0.02) had a positive significant association with malaria infection.

# Conclusions

A strong relationship exists between malaria infection and socio-demographic risk factors. There was a decreasing malaria trend from 2013 to 2015, followed by a small increase in 2016. To further decrease the prevalence rate, intervention strategies should be designed and implemented to address current and local malariaassociated health problems that could help to reduce the problem of malaria among the population in the study area.
Zenebe, M. H., Mekonnen, Z., Loha, E., & Padalko, E. (2021b). Prevalence, risk factors and association with delivery outcome of curable sexually transmitted infections among pregnant women in Southern Ethiopia. *PLoS ONE*, *16*(3 March). Scopus. https://doi.org/10.1371/journal.pone.0248958

### Abstract

#### Introduction

Curable sexually transmitted infections (STIs) such as infection with Chlamydia trachomatis (C. trachomatis), Neisseria gonorrhoeae (N. gonorrhoeae), and Trichomonas vaginalis (T. vaginalis) can lead to adverse pregnancy and birth outcome. There are limited data on the prevalence and correlate of STI in Ethiopia, yet pregnant women are not screened for curable STI. Hence in this study, the prevalence of STIs and associated risk factors were assessed.

#### Methodology

A cross- sectional study was conducted on consecutive women attending the delivery ward at the Hawassa comprehensive and specialized hospital. Vaginal swabs collected at the time of labor and delivery were tested for C. trachomatis, N. gonorrhoeae and T. vaginalis using GeneXpert. Study participants responded to a questionnaire about their previous and current obstetric history and socio-demographic characteristics. Possible independent factors for curable STIs were assessed by chi-square, bivariable, and multivariable, logistic regression.

## Results

Of the 350 vaginal swabs tested, 51 (14.6%, 95% CI: 10.9-18.3) were positive for one or more curable STIs. The prevalence of C. trachomatis, N. gonorrhoeae and T. vaginalis were 8.3%, 4.3%, and 3.1%, respectively. STIs was associated (p<0.005) with the delivery outcomes birth weight and gestational age. A 3-fold increase in odds of acquisition STIs was found in currently unmarried women (AOR, 3.5; 95% CI: 1.1-10.4; p = 0.028), in women <25 years (AOR, 2.7; 95% CI 1.1-6.6; p = 0.031). Women reporting presence of vaginal discharge (AOR, 7.7; 95% CI: 3.2-18.6; p < 0.001) and reporting pain during urination (AOR, 6.5; 95% CI: 2.6-16.2; p <0.001) found to associate with curable STIs.

# Conclusion

The higher magnitude of STIs found in this population, and the absence of symptoms in many illustrate the need for systematic follow-up during routine antenatal care primarily history taking and asking for signs and symptoms to provide early management and avoid long term sequelae.

# Adow, M. T., Gebresilasie, S. F., & Abebe, N. A. (2021). Primary ovarian choriocarcinoma: Rare entity. *Case Reports in Obstetrics and Gynecology*, 2021. Scopus. https://doi.org/10.1155/2021/4545375

# Abstract

# Background

Primary pure ovarian choriocarcinoma is a rare aggressive tumor which can be nongestational arising from germ cells or gestational origin. Preoperative diagnosis of extrauterine choriocarcinoma is challenging due to nonspecific clinical presentation.

Case Presentation

This article reports primary ovarian choriocarcinoma, likely gestational in a 25-year-old para 2 woman presenting with lower abdominal pain and swelling of two-week duration. Diagnosis was suspected by serum beta-human chorionic gonadotropin and confirmed histologically after surgery. Postoperatively, she was managed with multiple courses of chemotherapy using a bleomycin, etoposide, and cisplatin regimen, and the treatment was effective.

# Conclusion

In patients with adnexal mass presenting with nonspecific symptoms especially with high Doppler blood flow of the mass on ultrasound evaluation, serum beta-human chorionic gonadotropin determination is recommended before laparotomy. In setups where the genomic test is not available, histological and clinical effort to differentiate gestational versus nongestational choriocarcinoma is useful for specific management decision Gebremariam, S. N., & Marchetti, J. M. (2021b). Process simulation and techno-economic performance evaluation of alternative technologies for biodiesel production from low value non-edible oil. *Biomass and Bioenergy*, *149*. Scopus. https://doi.org/10.1016/j.biombioe.2021.106102

#### Abstract

In this study the techno-economic performances of three possible technologies have been assessed to identify the better one. The studied technologies include: Glycerol enriched CaO catalyzed, Supercritical ethanol, and Solid acid catalyzed processes. The overall study is based on complete process simulations using two commercially known software - Aspen Plus and Super Pro. The complete process layout for each option has been designed based on reasonable assumptions and optimum reaction conditions taken from relevant literatures. The amount and quality of biodiesel and glycerol as well as the amount of biodiesel per amount of feedstock used have been used to assess the relative technical performances among the process alternatives. For economic performance evaluation, the total cost of investment, unit cost of production, internal rate of return, net present value and project payback time have been used. The economic feasibility of each process towards change in production capacity has also been assessed. In addition, the sensitivity of each process scenario for the possible global market fluctuations of inputs and outputs has been evaluated. The glycerol enriched CaO catalyzed option is found to be the most economically feasible option under the given market scenario. All the three options are proved to be good in their technical performances, even though the solid acid catalyzed, and supercritical options are not economically efficient.

# Amekawa, Y., Hongsibsong, S., Sawarng, N., Yadoung, S., & Gebre, G. G. (2021). Producers' perceptions of public good agricultural practices standard and their pesticide use: The case of Q-GAP for cabbage farming in Chiang Mai Province, Thailand. *Sustainability* (*Switzerland*), 13(11). Scopus. https://doi.org/10.3390/su13116333

#### Abstract

This study examined the effectiveness of Thailand's Q-GAP initiative in raising cabbage farmers' awareness regarding food safety assurance and improving their pesticide use practices by comparing 41 Q-GAP-certified and 90 uncertified farmers in Chiang Mai Province, Thailand. The research methods included a questionnaire survey administered to the participating farmers and

laboratory pesticide residue testing of their cabbage produce samples. The research found that certified farmers had a significantly more heedful attitude than uncertified farmers toward the effects of pesticide use on the users, consumers, and the environment. This is supported by the higher level of Q-GAP training experiences. Compared to uncertified farmers, a significantly lower proportion of certified farmers also applied either insecticide, fungicide, or herbicide, with significantly less frequencies when including in the analysis those who did not use the particular pesticide. In the pesticide residue analysis, no significant difference was found between the two types of farms regarding the number of farms detected with minimum residue level exceedance in the sample produce and regarding the results of the aggregate organophosphate pesticide analysis. However, it was found that the produce of the uncertified farmers' progress in process control from earlier Q-GAP studies on compliance. However, considering the limited achievements of certified farmers in pesticide handling and recordkeeping, and those of the Department of Agriculture officers in auditing, there is a need for more governmental efforts, especially in these areas.

Bayssa, M., Yigrem, S., Betsha, S., & Tolera, A. (2021). Production, reproduction and some adaptation characteristics of Boran cattle breed under changing climate: A systematic review and meta-analysis. *PLoS ONE*, *16*(5 May). Scopus. https://doi.org/10.1371/journal.pone.0244836

#### Abstract

# Introduction

Climate change affects livestock production and productivity, which could threaten livestockbased food security in pastoral and agro-pastoral production systems of the tropics and sub-tropics. Boran cattle breed is one of the hardiest Zebu cattle reared by Borana Oromo pastoralists for milk and meat production. However, there is limited comprensive information on production, reproduction and adaption traits of the Boran cattle in Ethiopia. Thus, this paper aims to compile the main production, reproduction and some adaptation traits of Boran cattle based on systematic review and meta-analysis of peer reviewed published and unpublished literature.

#### Methodology

A combination of systematic review and meta-analysis based on PRISMA guideline was employed. Accordingly, out of 646 recorded articles identified through database searching, 64 were found to be eligible for production, reproduction and adaptation characteristics of the Boran cattle, 28 articles were included in qualitative systematic review while 36 articles were used for quantitative meta-analysis.

# Result

The Boran cattle breed has the ability to survive, produce and reproduce under high ambient temperature, utilize low quality forage resources, and resist water shortage or long watering intervals and tick infestations. The review revealed that the breed employs various adaptation responses (morphological, physiological, biochemical, metabolic, cellular and molecular responses) to cope with harsh environmental conditions including climate change, rangeland degradation, seasonal feed and water shortages and high incidences of tick infestations. The meta-analysis using a random-effects model allowed provision of pooled estimates of heritability and genetic correlations for reproduction and production traits, which could be used to solve genetic prediction equations under a population level in purebred Boran cattle. In addition, heritability and genetic-correlation estimates found in the present study suggest that there is high genetic variability for most traits in Boran cattle, and that genetic progress is possible for all studied traits in this breed.

#### Conclusion

The Boran cattle breed has the ability to survive, produce and reproduce under high ambient temperature, utilize low quality forage resources, and resist water shortage or long watering intervals and tick infestations. However, currently there are several challenges such as recurrent droughts, pasture deterioration and lack of systematic selection and breeding programs that play to undermine the realization of the potential of the breed. Thus, we recommend systematic selection for enhancing the reproductive and production performances without compromising the adaptation traits of the breed coupled with improved management of rangelands.

# Abera, M., Tolera, A., Nurfeta, A., & Geleti, D. (2021a). PRODUCTION, UTILIZATION AND CONSTRAINTS OF DESHO GRASS (Pennisetum glaucifolium) AS LIVESTOCK FEED IN ETHIOPIA. Online Journal of Animal and Feed Research, 11(6), 196–205. Scopus. https://doi.org/10.51227/OJAFR.2021.29

#### Abstract

The study was conducted with the objective of assessing farmers' production practice, utilization and constraints of Desho grass (Pennisetum glaucifolium) production in Chencha, Bule and Hula districts, Ethiopia. The methodology of this study encompassed questionnaire survey and group discussion. Simple random sampling was used to select a sample consisting of 199 households in the districts. The collected data were analyzed by SPSS and SAS software. The result indicated that of the total respondents, 69% did not used fertilizer and 72% respondents not practiced weeding, Generally, the majority of respondents, did not use any forage improvement practice after plantation. Concerning forage utilization, 48.2, plant Desho as soil band, while 26.6% plant as hedgerows and 25.1% plant in the back yard. 40.2 % of the respondents reported that they plant Desho grass for both feeding animals and soil conservation, while the remaining 36.7% plant Desho only for feeding animals, 20% plant Desho gras for sale and 3% plant Desho grass for only soil conservation. Based on the laboratory result, Desho grass is classified as high quality feedstuff for the study area. The crude protein, neutral detergent fiber, acid detergent fiber, acid detergent lignin content and in vitro organic matter digestibility of sample Desho grass was 7.04, 72.47, 43.73, 5.4 and 52.19 percent, respectively. Land shortage and lack of awareness were ranked first and second constraints for Desho production in the study area. It can be conclude that, Desho grass have a very important function in terms of contribution of nutrients to livestock and locally available feed resource however, farmers are not getting the benefits they deserve from the use of Desho grass, which has not been improved and should be supported by research to improve it production and use.

Agrahari, A., Singh, P., Veer, A., Singh, A., Vidyarthi, A., & Khan, B. (2021). Prognosticating the effect on Unemployment rate in the post-pandemic India via Time-Series Forecasting and Least Squares Approximation. *Pattern Recognition Letters*, *152*, 172–179. Scopus. https://doi.org/10.1016/j.patrec.2021.10.012

#### Abstract

The current paper aims to analytically visualize the future outcomes that the post-pandemic India might have in store for its citizens. We use time series forecasting on various collected data and combined the statistics of economics-deciding parameters to forecast the trends that might be prevalent in the next year. Since, the data contains a single anomalous trend, even the Prophet model could not learn this property from the data since this trend is not seasonal in nature. The current study proposes a novel architecture to deal with these rare unusual trends by combining two models - one learning normal usual patterns and the other getting trained on usual as well as rare anomalous patterns. It could help in dealing with sudden hike patterns like due to COVID-19 in the data, and lead to better forecasting on future timeframes. We combined the results of two distinct time-forecasting models trained on two sets of data of varying timeline lengths, using parameters obtained from Least Squares Approximation (LSA). The LSA helps us find an approximate vector approximation so as to obtain a model performing closely to the actual.

# Rathore, B., Mahela, O. P., Khan, B., & Padmanaban, S. (2021). Protection scheme using wavelet-alienation-neural technique for UPFC compensated transmission line. *IEEE Access*, *9*, 13737–13753. Scopus. https://doi.org/10.1109/ACCESS.2021.3052315

# Abstract

Fault analysis (detection, classification and location) of transmission network is of great importance in power system. A Wavelet-Alienation-Neural (WAN) technique has been developed for the fault analysis of Unified Power Flow Controller (UPFC) compensated transmission network. The detection and classification of various outages are accomplished by alienation of wavelet based approximate coefficients computed from current signals. The precise location of faults is carried out by an Artificial Neural Network fed from estimated approximate coefficients computed from voltage and current signals of the same quarter cycle. The robustness of the algorithm is proved with the case studies of varying fault locations, sampling frequency, system parameters, effects of noise, fault incipient angle, different control strategies and fault path impedances.

Mordal, E., Hanssen, I., Biratu, A. K., & Vatne, S. (2021). Providing safe maternity care under challenging conditions in rural Ethiopia: A qualitative study. *BMC Health Services Research*, 21(1). Scopus. https://doi.org/10.1186/s12913-021-06324-4

#### Abstract

#### Background

Women's health and the reduction in the global maternal mortality rate is a research priority worldwide. The aim of this study was to investigate the structural conditions that influence the maternity care provided for women in rural Ethiopia.

# Methods

A qualitative descriptive study was conducted, composed of 28 individual in-depth interviews with midwives and women who had given birth during the past 8 months, and observations of maternity care at health centres and a primary hospital. A thematic analysis was conducted.

#### Results

The midwives do their utmost to save the lives of mothers and prioritise saving lives over providing compassionate care. Inadequate resources, such as equipment, medicine and water, affect the quality of care they provide for the birthing women. This creates a conflict between the midwives' ideals and what conditions allow them to do. Families and the women's network play important roles in providing care and support to the women who give birth in health facilities.

# Conclusions

Structural conditions make it difficult for Ethiopian midwives in rural areas to provide optimal maternity care. In addition to the availability of professional midwifery care, the expectant mothers' families and networks also tend to provide important support and care. Further studies on how to improve the quality of maternity care from the women's perspective are needed.

Zula, A. T., Ayele, D. A., & Egigayhu, W. A. (2021). Proximate composition, antinutritional content, microbial load, and sensory acceptability of noodles formulated from moringa (Moringa oleifera) leaf powder and wheat flour blend. *International Journal of Food Science*, *2021*. Scopus. https://doi.org/10.1155/2021/6689247

### Abstract

#### Background

Noodle products are popular throughout the world, and they can be prepared from cereal like wheat, maize, and rice. Nowadays, healthy and nutritious product requirement has been increasing. Thus, research on the nutrition-rich but neglected crop is becoming visible nowadays to ensure global food security and to satisfy the nutritional need. Research indicated that moring tree leaf powder has good nutritional value, but it is not yet customized and properly consumed.

# Method

The study is aimed at developing noodles from wheat flour and moringa leaf powder and evaluating proximate composition, antinutritional content (phytate and tannin), microbial load (total plate count and yeast and mold count), and sensory acceptability. The experiment contains four treatments and one control. The data from proximate composition, antinutritional content, microbial load, and sensory acceptability were subjected to SAS version 9 software. A complete randomized design was used to analyze the proximate composition, antinutritional content, and microbial load data, and a randomized complete block design was used to analyze the acceptability test.

#### Result

The study revealed that in the noodles formulated from 80% durum wheat flour and 20% of moringa leaf powder, the ash, protein, fat, fiber, gross energy, phytate, and tannin content were increased by 39.39%, 10.86%, 153%, 42.2%, 3.43%, 39.83%, and 329.78%, respectively, as compared with noodles made from 100% durum wheat flour. However, moisture, total bacteria count, and yeast and mold count were decreased by 28.71%, 45.52%, and 55.93%, respectively. Similarly, the study also revealed that the acceptability test of noodles was decreased as moringa leaf powder concentration is increased.

# Conclusion

In conclusion, besides the good nutritional profile and antimicrobial capacity, moringa has antinutritional content and influences the sensory acceptability of products. Therefore, limiting the moringa leaf powder concentration is needed during the development of products using moringa leaf powder.

Mohamed, A., Worku, H., & Kindu, M. (2021). Quantification and mapping of the spatial landscape pattern and its planning and management implications a case study in Addis Ababa and the surrounding area, Ethiopia. *Geology, Ecology, and Landscapes*, 5(3), 161–172. Scopus. https://doi.org/10.1080/24749508.2019.1701309

#### Abstract

Rapid urbanization in Addis Ababa and the surrounding area resulted in the rapid land use/land cover (LULC) change that affected landscape structures and ecological functions. This study aimed at quantifying and mapping the spatial patterns of landscape structure for a sustainable city region landscape conservation planning and management. GIS and statistical tools were used to compute important landscape metrics. Pearson Correlation and factor analysis were also applied to reduce redundant indices and identify underlining factor of the landscape structure by network of hexagonal area. The analysis depicted four landscape and four class-level underlined metrics. Accordingly, as the region overall landscape was characterized by patch size and density, shape and texture (interspersion) index, the forest class also attributed by patch size and density, and shape metrics. The result shows that the region landscape complexity to maintain the natural land cover habitat functioning, the amount of ecological process and extent of human intervention. This research will help scientific base decision-making in conservation planning and management of the tropical highland urban landscape in general, and the study area in particular.

Abate, S., Belayneh, M., & Ahmed, F. (2021). Reclamation and amelioration of saline-sodic soil using gypsum and halophytic grasses: Case of Golina-Addisalem irrigation scheme, Raya Kobo Valley, Ethiopia. *Cogent Food and Agriculture*, 7(1). Scopus. https://doi.org/10.1080/23311932.2020.1859847

#### Abstract

In Golina-Adisalem irrigation scheme, 500 ha becoming salt-affected. Rehabilitation of saltaffected fields using drainage is expensive and leaching by far not feasible in shallow water table areas. The alternative way is chemical amendment and bioremediation. Therefore, the field experiment was conducted to evaluate the possibility of using gypsum soil amendment and halophytic grasses on modification properties of saline-sodic soil, and their effects on infiltration. The gypsum levels (0%, 75%, 100%, 125% gypsum requirement) and halophytic grasses (Chlorosis Guayana and CynodonDactaylon) were set in factorial RCBD design with three replications. After the 2nd harvest, the highly significantly (P < 0.01) lowest pHe (7.23, 7.29, 7.51), ECe (4.62, 4.89, 4.31 dS m-1), SAR (10.78, 15.81, 16.38), and ESP (8.93, 8.66, 9.47%) were recorded from Chlorosis Guayana+125% gypsum requirement (G) and Cynodon Dactaylon +125% gypsum requirement (G) applied treatment, whereas the highest pHe (8.54, 8.66, 8.77), ECe (20.1, 16.31, 11.431dS m<sup>-1</sup>), SAR (50.12, 54.23, 57.29) and ESP (57.37, 66.22, 72.26%) was obtained from the control treatment for 0-20, 20-40, 40-60 cm depths, respectively. The reclamation efficiency of Chlorosis Guayana+125% G was statistically equal with CynodonDactaylon +125% G. The highest infiltration rates were noted from soils treated with Chlorosis Guayana+125% G (6.3 cm/hr) and CynodonDactaylon+125% G (5.92 cm/hr); while the lowest value (1.22 cm/hr) was recorded from the control treatment. Therefore, the combined application of Chlorosis Guayana (Rhodes grass massava variety)+125% G and CynodonDactaylon (Panicum grass maxima variety)+125% G was the most efficient treatment for improving saline-sodic soil.

Mahla, R., Khan, B., Mahela, O. P., & Singh, A. (2021). Recognition of complex and multiple power quality disturbances using wavelet packet-based fast kurtogram and ruled decision tree algorithm. *International Journal of Modeling, Simulation, and Scientific Computing*, *12*(5). Scopus. https://doi.org/10.1142/S179396232150032X

#### Abstract

This paper introduces an algorithm based on wavelet packet supported fast kurtogram and decision rules for the identification and classification of complex power quality (PQ) disturbances. Features are extracted from the signals using fast kurtogram, envelope of filtered voltage signal and amplitude spectrum of squared envelop. Proposed algorithm can be implemented for the recognition of the complex PQ disturbances, which include the combination of voltage sag and harmonics, voltage momentary interruption (MI) and oscillatory transient (OT), voltage MI and harmonics, voltage sag and impulsive transient (IT), voltage sag, OT, IT and harmonics. Proposed work has been performed using the MATLAB software. Performance of the algorithm is compared with performance of algorithm supported by discrete wavelet transform (DWT) and fuzzy C-means clustering (FCM).

Negash, B., Azerefegne, F., & Ayalew, G. (2021). Regional variation in susceptibility of thrips (Thysanoptera: Thripidae) to insecticides on onion in the Rift Valley of Ethiopia. *International Journal of Tropical Insect Science*, *41*(2), 1579–1584. Scopus. https://doi.org/10.1007/s42690-020-00358-7

# Abstract

The responses of thrips to commonly used insecticides were studied in onion fields with the aim of detecting presence or absence of thrips resistance to insecticides in the Central Rift Valley of Ethiopia. Thrips populations were collected from area with heavy pesticide use history Meki and Melkassa and less use areas of Werer and Minjar. Collected adult thrips populations were exposed to various concentrations of  $\lambda$  -cyhalothrin, dimethoate, profenofos, diazinon and spinetoram treated vial and thrips mortality was assessed after 24 h. The percent mortality was significantly lower in Meki and Melkassa collected thrips populations than in Minjar and Werer populations to  $\lambda$  –cyhalothrin and diazinon at recommended field rate. On the other hand, differences were

insignificant for the insecticides spinetoram and profenofos at recommended field rate. Of the five tested insecticides  $\lambda$  –cyhalothrin had higher resistance ratios to Meki (10.8-fold) and Melkassa (6.78- fold) collected thrips population, while resistance ratio was intermediate to diazinon and lowest to dimethoate and profenofos insecticides. Results of this study suggest that thrips affecting onion in Meki and Melkassa areas have developed resistance to  $\lambda$  –cyhalothrin and diazinon insecticides. Periodic assessment of efficacy of registered insecticides and deploying a pesticides resistance management strategy are useful for sustainable use of pesticides in integrated thrips management program.

Agajie, T. F., Khan, B., Guerrero, J. M., & Mahela, O. P. (2021). Reliability enhancement and voltage profile improvement of distribution network using optimal capacity allocation and placement of distributed energy resources. *Computers and Electrical Engineering*, 93. Scopus. https://doi.org/10.1016/j.compeleceng.2021.107295

#### Abstract

In the radial distribution system, reliability is the most critical performance criterion. Additionally, optimizing the voltage profile is critical. This work proposed the optimal placement of distributed energy resources (DERs) to enhance the reliability and improve the voltage profile of the distribution feeder. To perform this research, two practical feeders of the Debre Markos (D/M) city distribution network, Ethiopia were used, which were affected by the outages. A composite system adequacy assessment, which includes the two main components of the power grid, i.e. generation and distribution, is performed using Monte Carlo simulation. The computed results show that integrating DER units improved the overall system's reliability. Further, the effect of varying DER penetration on reliability and voltage profile is also analyzed. ETAP and DIgSILENT software environments are used to perform this research.

Tsade Kara, H., Anshebo, S. T., Sabir, F. K., & Adam Workineh, G. (2021). Removal of Methylene Blue Dye from Wastewater Using Periodiated Modified Nanocellulose. *International Journal of Chemical Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/9965452

# Abstract

The study was focused on the preparation and characterizations of sodium periodate-modified nanocellulose (NaIO4-NC) prepared from Eichhornia crassipes for the removal of cationic methylene blue (MB) dye from wastewater (WW). A chemical method was used for the preparation of NaIO4-NC. The prepared NaIO4-NC adsorbent was characterized by using X-ray diffraction (XRD), Fourier transform infrared (FTIR), scanning electron microscope (SEM), energy-dispersive X-ray (EDX), and Brunauer-Emmett-Teller (BET) instruments. Next, it was tested to the adsorption of MB dye from WW using batch experiments. The adsorption process was performed using Langmuir and Freundlich isotherm models with maximum adsorption efficiency (qmax) of 90.91 mg·g-1 and percent color removal of 78.1% at optimum 30 mg·L-1, 60 min., 1 g, and 8 values of initial concentration, contact time, adsorbent dose, and solution pH, respectively. Pseudo-second-order (PSO) kinetic model was well fitted for the adsorption of MB dye through the chemisorption process. The adsorption process was spontaneous and feasible from the thermodynamic study because the Gibbs free energy value was negative. After adsorption, the decreased values for physicochemical parameters of WW were observed in addition to the color removal. From the regeneration study, it is possible to conclude that NaIO4-NC adsorbent was recyclable and reused as MB dye adsorption for 13 successive cycles without significant efficient loss.

Shumiye, Y. G., Bushra, F. Y., Sirak, E. H., & Wondimagegnehu, M. B. (2021). Renal immature teratoma: A rare entity; A case report and literature review. *Urology Case Reports*, *34*. Scopus. https://doi.org/10.1016/j.eucr.2020.101495

# Abstract

Teratomas are neoplasms commonly arising from the gonads. Kidney is one of the rare sites of origin of the tumor. Immature intra renal teratoma is even more rare and to date only 4 cases have been reported in the literature. We report a rare case of renal immature teratoma diagnosed in a 6 months old female patient, discuss its pathology and review relevant literature.

Assefa, S., Haile, W., & Tena, W. (2021b). Response of bread wheat to sulfur and phosphorus fertilizers in the north central Ethiopia. *Agriculture and Food Security*, 10(1). Scopus. https://doi.org/10.1186/s40066-021-00303-y

# Abstract

#### Background

Emerging research evidences since few years back are indicating that sulfur (S) is becoming a limiting nutrient in some Ethiopian soils. However, these evidences are not sufficient to make a solid conclusion that some soils of Ethiopia have became deficient in S. There is also limited information on the interaction effects of S and phosphorus (P) on bread wheat in Ethiopia. Therefore, an experiment was conducted to evaluate the effects of S and P fertilizers; and their interaction on yield components and yield of bread wheat grown at Gerba and Deneba locations, Northern central Ethiopia. A factorial experiment consisting of three levels (0, 15 and 30 kg ha–1) of S and four levels (0, 11, 22 and 44 kg ha–1) of P was laid out in RCB design with three replications.

#### Results

Results revealed that yield components and yield of wheat were significantly affected by both main and interaction effects of S and P fertilizers in both locations. At Gerba, S applied at 15 and 30 kg ha–1 increased grain yield (GY) of wheat by 32 and 44% over untreated control treatment, respectively. The corresponding increases at Deneba were 29 and 37% over untreated control treatment, respectively. However, significantly higher GY was obtained with treatments involving combined application of S and P than that obtained with single application of S or P. GY gains due to S and P interaction effect ranged from 46–65 to 52–75% over untreated control treatment at Gerba and Deneba, respectively. Optimum GY of wheat was obtained with treatment involving 15 kg S ha–1 + 22 kg P ha–1.

# Conclusion

The results of this experiment revealed that application of P and S fertilizer has significantly increased yield component, grain and straw yield of wheat compared to unfertilized control plot, indicating insufficient soil P and S content for optimum production of wheat and this was confirmed by very low soil test values of S in both sites. Combined application of S and P produced significantly higher yield of wheat than that obtained with single application of S or P indicating synergistic interaction between these nutrients. In all cases, optimum grain and straw yield of wheat was obtained with treatment involving at 22 P + 15 S kg ha–1, while a partial budget analysis result revealed that a combination of 22P and 15S kg ha–1 produced the highest MMR (54.9%). Thus this treatment is found to be economically feasible treatment for bread wheat production in study area of the district.

Bang, S., Qamar, A. Y., Tanga, B. M., Fang, X., & Cho, J. (2021). Resveratrol supplementation into extender protects against cryodamage in dog post-thaw sperm. *The Journal of Veterinary Medical Science*, 83(6), 973–980. Scopus. https://doi.org/10.1292/jvms.21-0125

# Abstract

Antioxidants have multiple protective roles in a variety of cells and thus can be used to protect sperm against cryo-damage during freezing, which affects fertility. The antioxidant resveratrol (3,5,4-trihydroxytrans-stilbene; RSV) has been reported to protect the animal sperm during cryopreservation, including human sperm. In this study, we assessed the protective effects of RSV supplementation on dog sperm cryopreservation. Semen was collected from four dogs and the effect of different concentrations of RSV (0, 100, 200, and 400  $\mu$ M) on post-thaw sperm quality was examined. After thawing, sperm motility was assessed using computer-aided sperm analysis, and the structural integrity of the plasma membrane, acrosome, and chromatin was examined. In addition, their mitochondrial activity and gene expression were also assessed. Dog sperm cryopreserved with 200  $\mu$ M RSV showed significant improvement in post-thaw sperm motility

and viability compared with that of the control group (P<0.05). Moreover, RSV-supplemented samples showed significantly higher numbers of sperm with an intact plasma membrane, active mitochondria, and structural integrity of acrosomes and chromatin than that of control samples (P<0.05). Furthermore, gene expression showed that RSV supplemented samples showed lower expression of pro-apoptotic (BAX), reactive oxygen species (ROS) modulator oxidative stress-related (ROMO1) and 8-oxoguanine DNA glycosylase 1 (OGG1) whereas higher expression levels of anti-apoptotic (BCL2), protamine-2 (PRM2), protamine-3 (PRM3) and sperm acrosome-associated 3 (SPACA3) genes than control. Our results suggest that RSV, at its optimum concentration, can be efficiently used as an antioxidant in the cryopreservation of dog sperm.

Belete, M. D. (2021). Review of the underpinning reasons and field demonstrations to incorporate ecohydrologic strategy into landscape restoration in water-limited ecosystems. *Ecohydrology and Hydrobiology*, 21(3), 529–542. Scopus. https://doi.org/10.1016/j.ecohyd.2021.08.004

#### Abstract

Landscape restoration refers to the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. It has become an important theme of recent scientific and policy work. Despite the myriads positive impacts of restoration practices in developing countries, there are also numbers of socio-economic, technical, as well as governance limitations that need to be addressed innovatively. This research synthesizes the top-ten limitations that indicate inadequacy of the existing water resources management practices to enhance ecosystem sustainability potential. In parallel, the research advocates and demonstrates the pressing need of ecohydrology as a scientific paradigm. The identified limitations comprise: (1) underutilized role of dual regulation between 'biota and hydrology'; (2) the significant size of scarce productive lands that are forced to be out of production due to sizes of the physical land management technologies; (3) tendencies to over-engineer the environment; (4) less focus on water and nutrient cycle regulation; (5) tendency of considering the biological measures as a mere stabilizers of the physical measures instead of its opportunity for dual regulation (which is one of the ecohydrologic principles); (6) failure to target multiple ecosystem services as outcomes; (7) failure to provide immediate benefits to the farmers; (8) recommending passive restoration of extremely degraded landscapes which actually need ecologically assisted; (9) the need of climate-smartness of landscape restoration practices; and (10) tendency to be sectoral instead of systemically operating. The research also demonstrated that ecohydrologic strategy can address these gaps through its low-cost and high-impact practices.

Amare, H. H., & Lindtjorn, B. (2021b). Risk factors for scabies, tungiasis, and tineainfections among schoolchildren in southern Ethiopia: A cross-sectional Bayesian multilevelmodel.PLoSNeglectedTropicalDiseases,15(10).Scopus.https://doi.org/10.1371/JOURNAL.PNTD.0009816

# Abstract

#### Background

Skin problems cause significant sickness in communities with poor living conditions, but they have received less attention in national or global health studies because of their low mortality rates. In many developing regions, the prevalence of parasitic skin diseases among schoolchildren is not reported. Previous studies thus have attempted to identify risk factors for these conditions using the frequentist approach. This study aimed to assess the occurrence and risk factors of skin infections among rural schoolchildren in southern Ethiopia by combining a frequentist and a Bayesian approach.

# Methodology/Principal findings

Using three-stage random sampling, we assessed 864 schoolchildren aged 7–14 years from the Wonago district in southern Ethiopia. We detected potential risk factors for scabies, tungiasis, and tinea infections and recorded their hygienic practices and socio-demographic information. The frequentist model revealed a clustering effect of 8.8% at the classroom level and an insignificant effect at the school level. The Bayesian model revealed a clustering effect of 16% at the classroom level and 5.3% at the school level. Almost three-fourths of the sample had at least one type of skin problem, and boys were at higher overall risk than girls (adjusted odds ratio [aOR] 1.55 [95% Bayesian credible interval [BCI] 1.01, 2.28). Risk factors included unclean fingernails (aOR 1.85 [95% BCI 1.08, 2.97]); not washing the body (aOR 1.90 [95% BCI 1.21, 2.85]) and hair (aOR 3.07 [95% BCI 1.98, 4.57]) with soap every week; sharing a bed (aOR 1.97 [95% BCI 1.27, 2.89]), clothes (aOR 5.65 [95% BCI 3.31, 9.21]), or combs (aOR 3.65 [95% BCI 2.28, 5.53]); and living in a poor household (aOR 1.76 [95% BCI 1.03, 2.83]). Washing legs and feet with soap daily was

identified as a protective factor for each of the three skin diseases (aOR 0.23 [95% BCI 0.15, 0.33]).

# **Conclusions/Significance**

We observed high variation in skin problems at the classroom level, indicating the presence of shared risk factors in these locations. The findings suggest the need to improve children's personal hygiene via health education by schoolteachers and health workers.

Birhanu, Z., Ambelu, A., Fufa, D., Mecha, M., Zeynudin, A., Abafita, J., Belay, A., Doyore, F., Oljira, L., Bacha, E., Feyisa, J., Hadis, Z., Ayele, K., Addisu, Y., Gutu, B., Tesfaye, D., Tilahun, T., Imana, G., Tolosa, T., ... Kebede, Y. (2021). Risk perceptions and attitudinal responses to COVID-19 pandemic: An online survey in Ethiopia. *BMC Public Health*, 21(1). Scopus. https://doi.org/10.1186/s12889-021-10939-x

#### Abstract

#### Background

Effective risk communication is one of the critical strategies in the response to COVID-19. This study examined risk perceptions and attitudinal responses to COVID-19 among the educated section of the society in Ethiopia.

#### Methods

An internet-based survey was conducted from April 22 to May 04, 2020, in Ethiopia. A questionnaire addressing the perception of health threat-combination of perceived vulnerability (PV) and perceived seriousness (PS), and perceived efficacy-combinations of perceived response efficacy (PRE), perceived self-efficacy (PSE), and perceived collective efficacy (PCE). The data were analyzed using SPSS 21.0. Descriptive statistics were computed after the standardization of the scores. The scores for overall efficacy and threat were split by median value and response classifications were generated through threat by efficacy interactions. For statistical significance, 95% CI and p-value < 0.05 were used.

#### Results

A total of 929 respondents submitted their responses. Eight hundred and twenty-eight (89.1%) of the respondents were male and 753 (81.1%) were Christian. The perceived threat to COVID-19 was generally low (median = 58.3). The median score for overall efficacy, PRE, and PSE were

79.8, 87.5, and 80.0, respectively. However, the median value (66.7) for PCE was relatively low. Perceived threat significantly varied by age, education, occupation, and place of residence (p < 0.05). Perceived efficacy significantly differed by gender, residence, and use of some sources of information (p < 0.05). In terms of response to COVID-19, 290 (31.2%), 239 (25.7%), 175 (18.8%) and 225 (24.2%) of the respondents were in the responsive, pro-active, avoidant, and indifferent attitudinal categories, respectively. The avoidant and indifferent groups constituted a fear control response (mal-adaptive motivation towards COVID-19 protective behavior) whereas responsive and pro-active categories formed a danger control response (self-protective motivation). These responses varied significantly by residence, region, religion, and sources of information (p < 0.05).

# Conclusions

Understanding people's perceived health threat and efficacy is a critical step toward creating risk communication campaigns. Hence, this study provided an insight that has the potential to inform the COVID-19 risk communication campaigns targeting the educated section of the society, by ensuring a balanced combination of threat appeals and efficacy messages for improved self-protective responses.

Wakgari, N., Woyo, T., Kebede, E., Gemeda, H., Gebremedhin, S., & Binu, W. (2021). Risky Sexual Practice among Street Dwelling People in Southern Ethiopia: A mixed-Method Study. *Ethiopian Journal of Health Sciences*, 31(3), 475–484. Scopus. https://doi.org/10.4314/ejhs.v31i3.4

# Abstract

#### Background

The number of street dwellers in major cities in Ethiopia is rapidly increasing. However, their sexual health needs are not that much studied. Hence, this study assessed risky sexual practice and associated factors among street dwelling people in southern Ethiopia.

# Methods

A cross-sectional study employing a mixed method was conducted. For the quantitative part, a snowball sampling technique was made to conduct face-to-face interviews among 842 respondents. In-depth interviews among street dwellers and key informant interviews among stakeholders were conducted to collect qualitative data. A pre-tested and structured interviewer-

administered questionnaire was used to collect data. The collected data were entered using Epidata and exported to SPSS for analysis, and qualitative data analyzed by thematic analysis approach.

# Results

About one third, 266(31.6%), of the participants had risky sexual practices within the last year of the study period. Sexual violence such as gang rape and same-sex practice were reported qualitatively. Male respondents (AOR: 3.24, 95%CI: 2.09-5.02) had a more likelihood of risky sexual practice than females. Living in Dilla (AOR: 9.62, 95%CI: 4.49-20.58) and Wolaita Soddo towns (AOR: 14.35, 95%CI: 6.29-32.69) had also a more likelihood of risky sexual practice than living in Hawassa. Moreover, the daily average income of 21-50 Birr (AOR: 0.52, 95%CI: 0.29-0.92) had a less likelihood of risky sexual practice compared to those with a daily average income of 5-20 Birr.

#### Conclusion

Risky sexual practice among street dwelling people is found high. The Federal Ministry of Health and other stakeholders should work to cut risky sexual practices among street dwelling people.

# Keneni, Y. G., Senbeta, A. F., & Sime, G. (2021). ROLE OF SMALL-SCALE TREES PLANTATION AND FARMERS' ATTITUDE AND SKILL TOWARD PROPAGATION OF INDIGENOUS AND EXOTIC TREES: THE CASE OF SIDAMA, ETHIOPIA. *African Journal of Food, Agriculture, Nutrition and Development, 21*(105), 18804–18823. Scopus. https://doi.org/10.18697/AJFAND.105.19045

#### Abstract

The tree land cover in Ethiopia is declining due to deforestation, agricultural land expansion, overgrazing, firewood use and construction. Farm tree plantation has a potential to improve tree cover and the country's vision towards reducing greenhouse gases (GHG) emission by 2030. This study was conducted in Sidama of Ethiopia to assess the role of small-scale tree plantations, and the attitudes and skills of farmers in propagating and conserving indigenous trees as compared to exotic ones, and to identify major impediments for exotic and indigenous tree plantation. By using stratified random sampling, 149 household heads were selected and interviewed, and the tree plantation practices of 46 randomly selected farmers were observed. Advice and support given to farmers concerning tree plantation and nursery care were collected from 16 Woreda Rural Development Experts. During the study a total of 46 tree species were identified, and 92% of the

trees on the farmland were exotic. The percentage composition of the five most dominant tree species were Eucalyptus spp. (79.6%), Cupressus spp (8.5%), Cordia africana (4.8%), Grevillea robusta (3.3%), and Millettia ferruginea (1.8%). The trees provide several direct and indirect socioeconomic and ecological importance (construction, fuel, income, medicinal value, fencing, asset for present and next generation, fodder for livestock, garden shade, aesthetic, recreation, spiritual value, improve soil fertility and environmental impact remediation). The majority of farmers prefer exotic trees due to their fast growth, ease of nursery preparation and fast establishment, and higher income generation in shorter period. Though farmers like to plant indigenous trees for their ecological services such as improving soil fertility, producing durable household utensils, shading and other ecological values; land shortage and lack of knowledge on plant biology, nursery preparation and propagation method constrained its plantation. Therefore, introduction of appropriate technologies to the existing farming system is required for sustainable indigenous tree plantation in the study area.

# Dana, E., Asefa, Y., Hirigo, A. T., & Yitbarek, K. (2021). Satisfaction and its associated factors of infants' vaccination service among infant coupled mothers/caregivers at Hawassa city public health centers. *Human Vaccines and Immunotherapeutics*, *17*(3), 797–804. Scopus. https://doi.org/10.1080/21645515.2020.1790278

#### Abstract

Studies conducted on caregivers' satisfaction on child vaccination services were very scarce including the study area. Therefore, this study was aimed to assess satisfaction and associated factors in vaccination service among infant coupled mothers/caregivers attending at public health centers. A cross-sectional study was conducted on 404 infant coupled mothers/caregivers from 15 March to 15 April 2018 in the selected health centers of Hawassa city, Southern Ethiopia. A systematic random sampling technique was applied to collect relevant data through exit interview with an interviewer-administered structured questionnaire. The overall proportion of the mothers/caregivers who satisfied with their children immunization service was 76.7%. In addition, 89.7%, 77.1%, 77.2%, 65.8%, and 68.3% were satisfied with center, service providers approach and waiting time to get service, respectively. In addition, caregivers living closer to health centers were 5.9 times more likely to be satisfied than their counterparts, the adjusted odds ratio and 95%

confidence interval [AOR and 95%CI : 5.9(1.6-22.4)]. Caregivers who waited for  $\leq 30$  minutes to get service were 7.3 times more likely to be satisfied than those waited for >30 minutes [AOR and 95% CI: 7.3(3.9-13.6)]. The study indicated the overall satisfaction of caregivers concerning vaccination service to be suboptimal. Maternal/caregivers satisfaction plays a great role to follow vaccination schedule properly and completeness of immunization service for their infants.

Mony, P. K., Tadele, H., Gobezayehu, A. G., Chan, G. J., Kumar, A., Mazumder, S., Beyene, S. A., Jayanna, K., Kassa, D. H., Mohammed, H. A., Estifanos, A. S., Kumar, P., Jadaun, A. S., Hailu Abay, T., Washington, M., W/gebriel, F., Alamineh, L., Fikre, A., Kumar, A., ... Medhanyie, A. A. (2021). Scaling up Kangaroo Mother Care in Ethiopia and India: A multisite implementation research study. *BMJ Global Health*, *6*(9). Scopus. https://doi.org/10.1136/bmjgh-2021-005905

# Abstract

#### **Objectives**

Kangaroo Mother Care (KMC), prolonged skin-to-skin care of the low birth weight baby with the mother plus exclusive breastfeeding reduces neonatal mortality. Global KMC coverage is low. This study was conducted to develop and evaluate context-adapted implementation models to achieve improved coverage.

# Design

This study used mixed-methods applying implementation science to develop an adaptable strategy to improve implementation. Formative research informed the initial model which was refined in three iterative cycles. The models included three components: (1) maximising access to KMC-implementing facilities, (2) ensuring KMC initiation and maintenance in facilities and (3) supporting continuation at home postdischarge. Participants 3804 infants of birth weight under 2000 g who survived the first 3 days, were available in the study area and whose mother resided in the study area. Main outcome measures The primary outcomes were coverage of KMC during the 24 hours prior to discharge and at 7 days postdischarge.

#### Results

Key barriers and solutions were identified for scaling up KMC. The resulting implementation model achieved high population-based coverage. KMC initiation reached 68%-86% of infants in Ethiopian sites and 87% in Indian sites. At discharge, KMC was provided to 68% of infants in

Ethiopia and 55% in India. At 7 days postdischarge, KMC was provided to 53%-65% of infants in all sites, except Oromia (38%) and Karnataka (36%).

# Conclusions

This study shows how high coverage of KMC can be achieved using context-adapted models based on implementation science. They were supported by government leadership, health workers' conviction that KMC is the standard of care, women's and families' acceptance of KMC, and changes in infrastructure, policy, skills and practice.

Abera, W., Haregeweyn, N., Dile, Y., Fenta, A. A., Berihun, M. L., Demissie, B., Mulatu, C. A., Nigussie, T. A., Billi, P., Meaza, H., Woldearegay, K., Melesse, A. M., Moges, S. A., & Tamene, L. (2021). Scientific Misconduct and Partisan Research on the Stability of the Grand Ethiopian Renaissance Dam: A Critical Review of a Contribution to Environmental Remote Sensing in Egypt (Springer, 2020) (p. 293). Scopus. https://doi.org/10.1007/978-3-030-76437-1\_15

# Abstract

We present factual errors, methodological flaws, wrong assumptions, inadequate data use, misleading conclusions and scientific misconducts committed by a book chapter by Dandrawy and Omran (2020) on the GERD, titled "Integrated Watershed Management of Grand Ethiopian Renaissance Dam via Watershed Modeling System and Remote Sensing" in environmental remote sensing in Egypt and published at Springer (https://www.springer.com/gp/book/9783030395926 ). We used direct and indirect fact-checking methods that include consulting of the design report of the GERD, literature review and re-calculating some parameters to demonstrate the major flaws of the chapter. The main points of concern are (1) absence of hydrological and hydraulic model calibration to assess model input and parameter uncertainty; (2) generation of intensity-durationfrequency curve of the Upper Blue Nile basin based on a single station data, while there are more than 40 meteorological stations within and around the basin; (3) ill-defined and exaggerated topographic parameters such as flow length, slope and time to peak to overestimate flood flow; (4) failure to include routing component in the modeling while estimating flood despite large size of the basin with over 1000 km river hydraulic length; (5) exaggerating the elevation-areacapacity curve of the GERD and significantly overestimating GERD's reservoir (lake) area; (6) unwarranted and misleading conclusions on the structural integrity of the GERD without supporting dam failure analysis and proper hydrologic and flooding assessment. Moreover, the

book Chapter has several accounts of scientific misconducts of plagiarism, falsification and fabrications that should not have passed any standard peer-reviewed processes for a highly reputable publisher with the stature of Springer. If such gross failures of scientific veracity and analytical weaknesses continue unaddressed, there is a clear danger that the public credibility of scientists and the forum in which they publish their scientific findings can be compromised. In addition, such publications, which lack scientific foundation, could undermine both scientific integrity and regional peace and security. The latter is predicated upon the realization that the discourse on GERD is a highly sensitive matter in north-east Africa. We thus believe that this critique paper can serve as a basis both for defending scientific integrity in other similar cases in the future and for providing pointers that would put science at the service of society.

# Eyasu, T., Mekuria, S., & Sheferaw, D. (2021). Seasonal prevalence of trypanosomosis, Glossina density and infection along the escarpment of Omo River, Loma district, southern Ethiopia. *Heliyon*, 7(4). Scopus. https://doi.org/10.1016/j.heliyon.2021.e06667

# Abstract

#### Background

The temporal information of trypanosomosis and tsetse apparent density is very limited in the southern part of the country. So, the study was conducted to estimate the temporal, dry and wet seasons, prevalence of cattle trypanosomosis, and tsetse fly apparent density and its infection by trypanosome along the escarpment of Omo River, Loma district, Southern Ethiopia.

#### Methods

A total of 964 cattle (482 in each seasons) were examined for trypanosomosis using buffy coat technique. For Glossina and biting flies study a total of 80 odor-baited, acetone and aged cow urine, NGU traps were deployed around the watering and grazing areas.

#### Results

The overall prevalence of cattle trypanosomosis was 4.98% of which 3.1% and 6.8% accounted to dry and wet seasons, respectively. The prevalence of trypanosomosis was significantly higher during wet season (OR = 1.93, P < 0.05), in poor body condition (OR = 3.71, P < 0.05) and in black coat colour (OR = 13.18, P < 0.05) animals. Two species of Trypanosome, T. congolense and T. vivax, were circulating in the area both in dry and wet seasons. A total of 327 Glossina (126 G. pallidipes and 201 G. fuscipes) were traped by using odour baited 80 NGU traps. The overall

apparent density of Glossina was 4.1 Flies/Trap/Day. Relatively higher Glossina/Trap/Day caught in wet season (4.9 Flies/Trap/Day) than dry season (3.3 Flies/Trap/Day). Two species of Glossina namely G. pallidipes and G. fuscipes were distributed in the study areas. From the flies caught 127 Glossina were randomly selected and dissected. The overall proportion of Glossina infection was 15% with higher proportion of infection in wet season (19.6%) than the dry season (11.3%). Higher infection proportion was observed in G. pallidipes.

# Conclusion

Trypansomosis is the major challenge for cattle productivity in the district. So to reduce the impact trypanosomosis and Glossina active community participation can play a key role.

# Wardle, J. M., Fischer, A., Tesfaye, Y., & Smith, J. (2021). Seasonal variability of resources: The unexplored adversary of biogas use in rural Ethiopia. *Current Research in Environmental Sustainability*, 3. Scopus. https://doi.org/10.1016/j.crsust.2021.100072

#### Abstract

Biogas digester programmes have been rolled out across many countries in sub-Saharan Africa over the past decade with varying levels of success. In Ethiopia, reported success rates have been low, despite high levels of interaction between non-governmental organisations and various levels of government, plus the establishment of practical eligibility criteria. In Halaba, Ethiopia, we investigated physical and social factors affecting feedstock and water availability using a face-toface questionnaire-based survey (n = 112) in four kebeles (local administration areas). We found that practices of fuel use and water collection were markedly different between seasons. Fuel use was almost entirely dependent on season, with wood being burned in the wet season and crop residues and cow dung being used instead in the dry season. A matched pair t-test found a significant difference between seasons in terms of water collection times ( $p = 7.4 \times 10^{-16}$ ), with households spending more time and money obtaining clean drinking water in the dry season. Results indicate that seasonal differences in resource availability may reduce the proportion of households that meet the physical characteristics for maintaining a biogas digester by approximately 62% from wet season to dry season. Conversely, the greatest benefits of digester use would be gained in the dry season, when dung could be returned to the soil as a nutrient-rich bioslurry, instead of being combusted as a dirty and inefficient fuel. Seasonality is rarely

considered in feasibility studies, so we recommend that these factors should be built into future analyses.

# Tang, Z., Lin, Y., Vosoogh, M., Parsa, N., Baziar, A., & Khan, B. (2021). Securing Microgrid Optimal Energy Management Using Deep Generative Model. *IEEE Access*, *9*, 63377–63387. Scopus. https://doi.org/10.1109/ACCESS.2021.3074460

# Abstract

This paper investigates the effect of data integrity attacks on the central control of the microgrids (MGs), which can lead to severe blackouts and load shedding. It assesses this cyber attack from the steady state and optimal scheduling point of view. In order to stop the cyber hacking, a new deep learning-based framework has been developed based on the generative adversarial networks (GANs). In this framework, two networks compete with each other, wherein the first network generates fake data, and the second one is responsible for the data classification. In order to get into the most optimal features, a new optimization method based on a modified teaching-learning based optimization (TLBO) algorithm is also devised to reinforce the GAN model and help a better matching training process. In addition, a new modification is introduced for TLBO to avoid premature convergence and provide high population diversity. To show the effectiveness of the proposed framework, a real dataset of several smart metering devices in a MG has been tested. Results illustrate the high performance of the proposed framework, comparing to the well-known conventional detection frameworks with hit rate of 93.11%, miss rate of 6.89%, false alarm rate of 7.76% and correct reject rate of 92.24%.

# Tanga, B. M., Qamar, A. Y., Raza, S., Bang, S., Fang, X., Yoon, K., & Cho, J. (2021). Semen evaluation: Methodological advancements in sperm quality-specific fertility assessment—A review. *Animal Bioscience*, *34*(8), 1253–1270. Scopus. https://doi.org/10.5713/ab.21.0072

#### Abstract

Assessment of male fertility is based on the evaluation of sperm. Semen evaluation measures various sperm quality parameters as fertility indicators. However, semen evaluation has limitations, and it requires the advancement and application of strict quality control methods to

interpret the results. This article reviews the recent advances in evaluating various sperm-specific quality characteristics and methodologies, with the help of different assays to assess sperm-fertility status. Sperm evaluation methods that include conventional microscopic methods, computerassisted sperm analyzers (CASA), and flow cytometric analysis, provide precise information related to sperm morphology and function. Moreover, profiling fertility-related biomarkers in sperm or seminal plasma can be helpful in predicting fertility. Identification of different sperm proteins and diagnosis of DNA damage has positively contributed to the existing pool of knowledge about sperm physiology and molecular anomalies associated with different infertility issues in males. Advances in methods and sperm-specific evaluation has subsequently resulted in a better understanding of sperm biology that has improved the diagnosis and clinical management of male factor infertility. Accurate sperm evaluation is of paramount importance in the application of artificial insemination and assisted reproductive technology. However, no single test can precisely determine fertility; the selection of an appropriate test or a set of tests and parameters is required to accurately determine the fertility of specific animal species. Therefore, a need to further calibrate the CASA and advance the gene expression tests is recommended for faster and fieldlevel applications.

Senbeta, A. F., Supit, I., & Harahagazwe, D. (2021). Sensitivity of potato yield and biomass to climate change effects in Gisozi, Burundi, and Washington, USA, and assessment of LINTUL4 model behavior. *Journal of Agriculture and Environment for International Development*, 115(1), 5–30. Scopus. https://doi.org/10.12895/jaeid.20211.1132

# Abstract

Understanding climate change effects on crop production and evaluate the effectiveness of adaptation strategies in both developed and developing countries is of key importance. Crop simulation models can provide useful insight on the effects of increasing temperatures and rising CO2 concentrations [CO2] as well as rainfall variations. In this study, the LINTUL4 model was used to study the sensitivity effect of five temperature (T) levels (-3, 0, 3, 6, and 9oC above/below minimum/maximum temperatures), three precipitation (W) changes (30% decrease, baseline and 30% increase), and CO2 levels (baseline(360), 450, 540, 630 and 720ppm) on nutrient limited yield (Yn), water limited yield (Yw), water and nutrient limited yield (Ynw) and potential yield (Yp) of potato crop in high-input Washington, USA and low-input Gisozi, Burundi. The maximum

weight of the tuber yield and aboveground biomass for Yp and Yw in Gisozi, and Yn and Yp in Washington was observed at combinations of lower temperature and elevated [CO2]. For Gisozi, maximum tuber yield for Yn and Ynw was observed at [CO2] of less than 720ppm. The results suggest that nutrient supply will continue to be the major limiting factor for potato production under elevated [CO2] in Gisozi, and water availability will limit Yw and Ynw rain-fed production in Washington. Generally, the LINTUL4 model performs well with few data input, but fails to predict the differential effect of high temperature on assimilate partitioning to aboveground and belowground biomass.

Van der Burg, E., Toet, A., Abbasi, Z., Brouwer, A.-M., Van Erp, J. B. F., Kallen, V. L., Kaneko, D., Kim, Y. E., Kinnear, M., de Kock, H. L., Kusbiantari, D., Lee, T.-R., Liu, Y., Luhovyy, B. L., MacEachern, E., Mezgebe, A. G., Nikolova, R., Olatunde, G., Srisayekti, W., ... Yürek, M. A. (2021). Sequential dependency for affective appraisal of food images. *Humanities and Social Sciences Communications*, 8(1). Scopus. https://doi.org/10.1057/s41599-021-00909-4

#### Abstract

How we perceive the world is not solely determined by our experiences at a given moment in time, but also by what we have experienced in our immediate past. Here, we investigated whether such sequential effects influence the affective appraisal of food images. Participants from 16 different countries (N = 1278) watched a randomly presented sequence of 60 different food images and reported their affective appraisal of each image in terms of valence and arousal. For both measures, we conducted an inter-trial analysis, based on whether the rating on the preceding trial(s) was low or high. The analyses showed that valence and arousal ratings for a given food image are both assimilated towards the ratings on the previous trial (i.e., a positive serial dependence). For a given trial, the arousal rating depends on the arousal ratings up to three trials back. For valence, we observed a positive dependence for the immediately preceding trial only, while a negative (repulsive) dependence was present up to four trials back. These inter-trial effects were larger for males than for females, but independent of the participants' BMI, age, and cultural background. The results of this exploratory study may be relevant for the design of websites of food delivery services and restaurant menus.

Zenebe, M. H., Mekonnen, Z., Loha, E., & Padalko, E. (2021c). Seroprevalence and associated factors of maternal cytomegalovirus in Southern Ethiopia: A cross-sectional study. *BMJ Open*, *11*(10). Scopus. https://doi.org/10.1136/bmjopen-2021-051390

#### Abstract

# **Objectives**

The aim of this study was to assess the seroprevalence and associated factors of cytomegalovirus (CMV) among pregnant women in Southern Ethiopia.

## **Design Cross-sectional study**

Setting The study was conducted in Hawassa University comprehensive and specialised hospital. Hawassa, Southern Ethiopia. Participants A total of 600 consecutive pregnant women attending the delivery ward were recruited for the study from August to October 2020. Outcome measures The study assessed the rate of maternal anti-CMV IgG and IgM antibodies. The association of obstetric history, sociodemographic and behavioural characteristics with seropositivity of CMV was also evaluated based on the collected data using structured questioners.

# Results

Seropositivity for CMV IgM antibodies was 8.2% (49/600) (95% CI 6% to 10.5%), whereas the CMV IgG was 88.7% (532/600), (95% CI 89.5% to 94.0%). Seroprevalence of CMV IgM was higher in women of older age, currently unmarried, having nursery schooled children and with any of the detected curable sexually transmitted infections, while seroprevalence of CMV IgG was significantly associated only with women having nursery schooled children. Seroprevalence was not significantly associated with previous adverse pregnancy outcome, gravidity, being a child daycare occupant mother and newborn birth weight.

#### Conclusion

In the present study, we identified a high rate of CMV IgM and CMV IgG seroprevalence among pregnant women in Southern Ethiopia. Given that there is no existing CMV diagnosis, special attention should be designed to pregnant women in parallel to the existing antenatal care facility. Besides, training healthcare professionals will support awareness conception among pregnant women concerning the sequels of CMV infection during pregnancy.

Aragaw, K., Regassa, F., Sibhat, B., Abayneh, T., Gelaye, E., Deresse, G., Egan, S., & Asmare, K. (2021). Seroprevalence and association of bovine viral diarrhea virus (BVDV) serostatus with reproductive problems in dairy cattle in central and southern Ethiopia. *Tropical Animal Health and Production*, 53(5). Scopus. https://doi.org/10.1007/s11250-021-02904-y

#### Abstract

Bovine viral diarrhea (BVD) is an economically important cattle disease with worldwide distribution and characterized mainly by suboptimal fertility in the affected herds. The objectives of this study were to estimate the seroprevalence of BVDV within dairy cattle, to identify potential risk factors, and to assess the association with occurrence of reproductive problems. Sera (n = 954)collected from dairy cattle from 98 herds in southern and central Ethiopia were tested for BVDV antibodies using a commercial ELISA. Among screened sera samples, 20.9% (95% CI, 18.4, 23.6) tested positive to BVDV antibodies. The herd prevalence was 50% (95% CI, 40.1, 59.9) and the intra-herd prevalence ranged between 2.6 and 100% (mean = 31.4%) in positive herds. Geographic region, herd size, and animal arrangement in the farm had significant association with serostatus (p < 0.05). Cattle from southern Ethiopia and herds of large size had 2.8 (95% CI, 1.9, 4.2) and 2.6 (95% CI, 1.5, 4.6) times higher odds of being seropositive compared to their counterparts, respectively. Serostatus to BVDV was associated with history of anestrus, repeat breeding (RB), mastitis, and extended calving interval (CI) (p < 0.05). Animals with history of extended CI and mastitis were 1.7 (95% CI, 1.0, 2.7) and 2.2 (95% CI, 1.5, 3.2) times more likely to be seropositive compared with those with normal CI and no history of mastitis, respectively. On the other hand, animals with history of anestrus and RB were less likely to be seropositive to BVDV compared to cattle with no such history. Sera from 26 selected cattle were also examined using reverse transcription (RT)-PCR for detection of BVDV RNA; however, all samples tested were negative for the presence of BVDV nucleic acid. Our study highlights the variation in BVDV status within Ethiopian dairy herds, and association with some important reproductive performance traits and potential risk factors.

Atalay, A. A., Abebe, R. K., Dadhi, A. E., & Bededa, W. K. (2021). Seroprevalence of hepatitis B virus among pregnant women attending Antenatal care in Dilla University Referral Hospital Gedio Zone, Ethiopia; Health facility based cross-sectional study. *PLoS ONE*, *16*(3 March). Scopus. https://doi.org/10.1371/journal.pone.0249216

#### Abstract

#### Introduction

A pregnancy that has been complicated with Hepatitis B virus (HBV) infection results in typical management problems for both the mother and the newborn. One of the universal efforts in tackling the impact of chronic HBV is the prevention of mother-to-child transmission during Antenatal care via prompt screening as the majority of chronic infections globally harbored during this period. Rewarding result have been achieved in reducing this problem at this period of life through maternal screening programs and universal vaccination of infants. This study was aimed at assessing the seroprevalence and associated risk factor of HBV among pregnant women attending Antenatal Care (ANC) in Dilla University Referral Hospital (DURH), Southern Ethiopia.

# Method

A facility- based cross- sectional study was conducted from December 01 to May 30, 2017 among pregnant women attending ANC. A total of 236 pregnant women were included in this study. All Pregnant women who were attending antenatal clinic and were volunteer during the study period were included, whereas those women who were unable to communicate due to any problem, and not volunteer to give informed consent were excluded. Volunteer participants were asked to complete a questionnaire and had offered to test for HBsAg infection. The data was analyzed using SPSS version 20 software. Logistic regression was used to determine the association between dependent and independent variables.

#### Results

From 215 pregnant women attending ANC, the prevalence of HBsAg by the rapid test was found to be 11 (5.1%). Among the study participants, 91.1% (215) were tested for HIV antibody during the ANC visit, with the positivity rate of 4.5%. The result showed 1.86% of the study participants who were tested for HIV were also positive for HBsAg. Among those factors affecting the transmission of HBV infection, multiple partners and HIV confection have significant association at P-value less than 0.05.

# Conclusion

The Seropositivity of Hepatitis B Virus among Pregnant Women was found to be significant and hence, routine screening of pregnant mother at Antenatal care for this virus, and subsequent management according to the guideline for both the mother and child is recommended.

Daka, D., Hailemeskel, G., & Fenta, D. A. (2021). Seroprevalence of hepatitis b virus and associated factors among female sex workers using respondent-driven sampling in hawassa city, ethiopia. *Infection and Drug Resistance*, 14, 4301–4311. Scopus. https://doi.org/10.2147/IDR.S332333

#### Abstract

#### Background

Female sex workers (FSWs) are a marginalized group having limited health-care access and poorquality care. Inevitably, they are vulnerable to sexually transmitted infections including hepatitis B virus. It is one of the most serious and major public health problems, with an increased risk of transmission and acquisition of the infection. Hence, this study was aimed to assess the prevalence and associated factors of HBV infection among FSWs in southern Ethiopia.

#### Methods

A cross-sectional study was conducted from November to February 2019 at Hawassa city among ISHDO confidential clinics among 383 FSWs using respondent-driven consecutive sampling techniques to select study participants using a standardized questionnaire. The blood samples were collected to detect viral surface antigen using ELISA. Data were entered into SPSS version 21. Descriptive and logistic regression analysis was used.

#### Results

The overall prevalence of HBV was 35 (9.2%) (95% CI=6.3–12.1). Among 381 FSWs, 249 (65.4%) of them had stayed for 2–5 years in sexual work. A total of 240 (63%) of them used condoms consistently during sexual practice. In multivariate analysis, FSWs who did not use a condom during sexual practice were 6-times more at risk than those who used a condom (AOR=6.38, CI=2.04–18.51). Condom breakage (AOR=2.10, CI=1.95–4.65), use of stimulants (AOR=3.25, CI=1.59–18.63), history of STI (AOR=2.15, CI=1.02–6.93), and genital ulcer (AOR=4.64, CI=1.31–11.35), number of sexual partners (AOR=3.25, CI=1.59–7.47), sex during menses (AOR=5.85, CI=1.29–21.44), sexual assault (AOR=2.93, CI=1.23–9.01), sharp material

sharing (AOR=4.98, CI=1.34–10.95), and history of abortion (AOR=2.46, CI=1.18–12.19) were statistically associated with HBV infection.

## Conclusion

The prevalence of HBV infection in this study was relatively high compared to the general population. Factors like sociodemographic, behavioral, and previous information were associated with HBV infection. There is a need for ongoing screening of this high-risk population to inform planning for vaccination and preventive measures.

Gunta, M., Tantu, T., Wolka, S., Meskele, M., Ayza, A., & Duko, B. (2021). Sexual and Reproductive Health Services Utilization among Wolaita Sodo University Students, Ethiopia: A Mixed Method Approach. *Scientific World Journal*, 2021. Scopus. https://doi.org/10.1155/2021/2415023

# Abstract

# Background

Youths have been facing different sexual and reproductive health problems such as HIV infections and unplanned pregnancies. Therefore, this study aimed to assess reproductive health services utilization and their associated factors among Wolaita Sodo University students in Wolaita Sodo, Ethiopia.

#### Methods

We conducted an institutionally-based mixed-method study among 759 regular undergraduate university students. Multistage random sampling and purposive sampling techniques have been used to recruit students for the quantitative and qualitative studies, respectively. A pretested self-administered questionnaire was used to collect the data. A logistic regression model was used for quantitative data analysis, whereas thematic analysis was used for qualitative data. We used open-code software-assisted qualitative data analysis. The statistical significance was declared at a P value less than 0.05.

### Results

We found that 378 (49.8%) (95% CI: 46.20-53.34) of respondents had utilized sexual and reproductive health services within the 12 months preceding the current survey. Being a first-year student (AOR = 1.57, 95% CI: 1.01-2.46), having ever had sexual intercourse (AOR = 5.12, 95%

CI: 3.31, 7.96), participating in peer-to-peer discussion (AOR = 1.46, 95% CI: 1.02-2.02), and having ever had sexual transmitted infection syndrome (AOR = 3.91, 95% CI: 1.41-10.85) have increased the odds of using sexual and reproductive health services.

#### Conclusion

Sexual and reproductive health services utilization among university students was inadequate and affected by several factors. Therefore, strengthening peer support networks and addressing the gap in services were highly recommended.

Pachauri, R. K., Bai, J., Kansal, I., Mahela, O. P., & Khan, B. (2021). Shade dispersion methodologies for performance improvement of classical total cross-tied photovoltaic array configuration under partial shading conditions. *IET Renewable Power Generation*, 15(8), 1796–1811. Scopus. https://doi.org/10.1049/rpg2.12147

# Abstract

Large size photovoltaic (PV) systems face a large number of issues based on malfunction and unfavourable climatic conditions such as partial shading conditions (PSCs). These PSCs are the major causes of PV systems' performance degradation. In this paper, a symmetric matrix (SM) game puzzle is used to reconfigure the electrical connections of the PV array system. Present shade dispersion methodology is based on the 'physical reallocation of PV module-fixed electrical connections' principle. Modification in the electrical connections of conventional total cross-tied (TCT) PV array configuration introduces a new 'SM-TCT' configuration. An extensive comparative study of conventional TCT and novel-TCT (NTCT) configurations with proposed SM-TCT configuration prove the effectiveness to achieve higher performance. The MATLAB/Simulink results are obtained on the basis of the non-linear nature of current-voltage and power-voltage characteristics. SM-TCT, Shape-do-Ku, NTCT and TCT configurations are examined under three realistic PSCs in terms of power and voltage at global maximum power point, improved fill factor, reduced power losses, performance ratio and power enhancement. Teferra, T. F. (2021b). Should we still worry about the safety of GMO foods? Why and why not? A review. *Food Science and Nutrition*, 9(9), 5324–5331. Scopus. https://doi.org/10.1002/fsn3.2499

#### Abstract

Global population is increasing at an alarming rate, posing a threat on the supplies of basic needs and services. However, population increase does not seem to be a common agendum of the global scientists and political leaders. People in the developed countries are more concerned about new technologies and their products. Pseudo-threats related to the uncertainties of genetic engineering of crops and their outputs present on consumers are more audible and controversial than the real difficulties the world is experiencing at the moment and in the future. This review presents brief summaries of the real reasons to worry about and the uncertainties about genetically modified organisms. This article also presents the real uncertainties shared by consumers and scientists with respect to the past, present, and future of genetically engineered organisms. Developments in the field of precision genetics in the recent years and the implications on regulatory, breeding, and socio-cultural dimensions of the global settings are included.

Nasab, M. A., Zand, M., Padmanaban, S., Dragicevic, T., & Khan, B. (2021). Simultaneous long-term planning of flexible electric vehicle photovoltaic charging stations in terms of load response and technical and economic indicators. *World Electric Vehicle Journal*, 12(4). Scopus. https://doi.org/10.3390/wevj12040190

#### Abstract

Photovoltaic charging stations (PVCSs) are one of the most important pieces of charging equipment for electric vehicles (EVs). Recently, the process of designing solar charging stations as flexible sources has been growing and developing. This paper presents a relatively complete design of a solar charging station as a flexible economic resource in a 10-year planning horizon based on a genetic algorithm in two scenarios. PVCSs are not considered in the first scenario. This scenario is only to confirm the results, and the proposed method is proposed. However, in the second scenario, the effects of PVCSs and the demand response strategy (DR) on this development are considered. Copula probability distribution functions are used to create appropriate scenarios for vehicles during different planning years. The proposed energy management system shows a stable performance in terms of the annual load growth index and electricity price of each level of
demand over the time horizon along with minimizing power losses and costs required, which makes PVCS efficiency higher and gives them a suitable structure and stability. The modeling results in terms of uncertainties in the system indicate that the use of load management along with PVCS design and flexible electric vehicle charge control strategies improves power quality parameters and optimizes system cost over a period of 10 years. Compared to the obtained results with the traditional case, it is observed that long-term planning in terms of DR and PVCSs and the technical specifications of the network have been improved. As a result of this proposed long-term planning, PVCSs are more flexible.

Rao, S. P. N., Minckas, N., Medvedev, M. M., Gathara, D., Y N, P., Seifu Estifanos, A., Silitonga, A. C., Jadaun, A. S., Adejuyigbe, E. A., Brotherton, H., Arya, S., Gera, R., Ezeaka, C. V., Gai, A., Gobezayehu, A. G., Dube, Q., Kumar, A., Naburi, H., Chiume, M., ... Lawn, J. E. (2021). Small and sick newborn care during the COVID-19 pandemic: Global survey and thematic analysis of healthcare providers' voices and experiences. BMJ Global Health, 6(3). Scopus. https://doi.org/10.1136/bmjgh-2020-004347

#### Abstract

#### Introduction

The COVID-19 pandemic is disrupting health systems globally. Maternity care disruptions have been surveyed, but not those related to vulnerable small newborns. We aimed to survey reported disruptions to small and sick newborn care worldwide and undertake thematic analysis of healthcare providers' experiences and proposed mitigation strategies.

#### Methods

Using a widely disseminated online survey in three languages, we reached out to neonatal healthcare providers. We collected data on COVID-19 preparedness, effects on health personnel and on newborn care services, including kangaroo mother care (KMC), as well as disruptors and solutions.

#### Results

We analysed 1120 responses from 62 countries, mainly low and middle-income countries (LMICs). Preparedness for COVID-19 was suboptimal in terms of guidelines and availability of personal protective equipment. One-third reported routine testing of all pregnant women, but 13% had no testing capacity at all. More than 85% of health personnel feared for their own health and 89% had increased stress. Newborn care practices were disrupted both due to reduced care-seeking

and a compromised workforce. More than half reported that evidence-based interventions such as KMC were discontinued or discouraged. Separation of the mother-baby dyad was reported for both COVID-positive mothers (50%) and those with unknown status (16%). Follow-up care was disrupted primarily due to families' fear of visiting hospitals (~73%).

#### Conclusion

Newborn care providers are stressed and there is lack clarity and guidelines regarding care of small newborns during the pandemic. There is an urgent need to protect life-saving interventions, such as KMC, threatened by the pandemic, and to be ready to recover and build back better.

Mergia, M. T., Weldemariam, E. D., Eklo, O. M., & Yimer, G. T. (2021). Small-scale Farmer Pesticide Knowledge and Practice and Impacts on the Environment and Human Health in Ethiopia. *Journal of Health and Pollution*, *11*(30), 1–19. Scopus. https://doi.org/10.5696/2156-9614-11.30.210607

#### Abstract

#### Background

Inappropriate use and application of pesticides in Ethiopia pose a major threat to the health of farmers and the environment. Objective. The present study aimed to assess the level of knowledge, attitudes, and practices of small-scale vegetable farmers towards the use of pesticides in Ethiopia along the Lake Ziway watershed.

#### Methods

This was a cross-sectional study involving a total of 210 farmers randomly selected during a period of pesticide application from a purposively selected village located in the immediate vicinity of Lake Ziway, Ethiopia. Data were generated through structured in-depth interviews and on-site observations on farms. A Chi-square test was applied to evaluate whether the collected data and their probable associations were significant.

#### Results

World Health Organization (WHO) class II pesticides (moderately toxic) were the most frequently used pesticides in the study area. There was no reported use of WHO classes 1a and 1b and banned or restricted pesticides such as dichloro diphenyltrichloroethane (DDT) and endosulfan. Most (92%) farmers reported indiscriminately disposing of empty containers in the field, while 86.7%

applied the leftover pesticides to other crops. More than 90% of small-scale farmers did not use any personal protective equipment (PPE) when handling pesticides. About 95% of farmers had poor knowledge regarding pesticides. A significant association (p < 0.001) was observed between the knowledge of farmers and their practices related to pesticides.

#### Conclusions

Generally, the knowledge of small-scale farmers on pesticides was poor. Moreover, the inappropriate disposal of pesticides and pesticide containers poses a risk to the environment. The findings of the present study underline the need to train farmers concerning the safe and proper use of pesticides to mitigate hazards to human health and the environment. Participant Consent. Obtained Ethics Approval. The study was granted an exemption from requiring ethics approval from the Hawassa University College of Natural and Computational Science, Research and Review Committee. Competing Interests. The authors declare no competing financial interests.

Wassie, Y. T., & Adaramola, M. S. (2021b). Socio-economic and environmental impacts of rural electrification with Solar Photovoltaic systems: Evidence from southern Ethiopia. *Energy for Sustainable Development*, 60, 52–66. Scopus. https://doi.org/10.1016/j.esd.2020.12.002

#### Abstract

Lack of access to electricity is one of the major impediments to economic development and the provision of public services in rural/off-grid areas of developing countries. This study examines the drivers and impacts of rural electrification with Solar Photovoltaic (PV) systems in Ethiopia from a cross-sectional study of 605 rural households and direct field examination of 137 solar PVs/lanterns. Multiple linear regression and econometric analyses were used to analyse the data. Findings showed that the use of solar PV systems in rural Ethiopia is growing and its impact appears significant. A solar-electrified rural household could save the consumption of 43.68 L of kerosene and emission of 107 kg CO2 per year compared with a non-electrified one. This reduction in kerosene use and the access to electricity from solar PVs could enable a rural household to save between US\$ 65 and \$75 per year from avoided energy costs and mobile charging expenses. The study finds that Solar PVs could provide rural households with access to electricity for 3 to 5 h a day, reduce health damage from kerosene lamps; and allow micro-businesses to generate more

income. Empirical results from a binomial logit, and multivariate probit analyses revealed that solar PV adoption is strongly influenced by several economic and non-economic factors. However, it was also found that the use and effectiveness of solar PV systems in rural/off-grid Ethiopia is faced with critical challenges from poor quality and counterfeit products in the market, high cost of quality-verified solar products, lack of after-sales maintenance services, and limited access to credit financing sources.

## Kibr, G., Mulugeta, A., & Bosha, T. (2021). Socio-economic Variables Associated with Motivational Barriers of Food Choice among Lactating Women from Central Ethiopia: A Cross-sectional Study. *Ecology of Food and Nutrition*, 60(3), 276–303. Scopus. https://doi.org/10.1080/03670244.2020.1845164

#### Abstract

Understanding the drivers of food choice is essential to guide the nutrition interventions and tailor nutrition counseling messages. There is strong evidence from a published study, which demonstrate attention for the need to consider the wide range of drivers during food choice. Due to the large variety of food products on the market, consumers make a multitude of food choice daily. The study aimed to assess major motivational drivers of food choice among randomly selected lactating women aged 15–49 years (423) from Debrebirhan Town using face to face interview. Logistic regression analysis was used to find association b/socio-economic variables and motivational drivers of food choice using SPSS version 20. Candidate variables were selected and transferred using the P- a value of less than 0.25, and AOR was reported. Variables with a Pvalue less than 0.05 on multiple variable logistic regressions were taken as significant variables. Influences of religion, price, preparation convenience, health value and taste during food choice were responded by above half of women. From logistic regression, 15-25 years' age and selfemployed were linked to religious influence in food choice with AOR (95% CI) of 0.09(0.01–0.48) and 4.13(1.4-12.24). Age (15-25 and 26-35 years), education (no, primary and secondary) and being housewife were associated to choosing of foods for their health value with AOR (95%CI) of 0.26(0.12–0.6), 0.37(0.18–0.76), 0.14(0.04–0.42), 0.25(0.13–0.54), 0.33(0.17–0.66) and 2.5(1.23–5). Only family size (2–4 vs.>4 persons) was associated with price concern in food choice with AOR (95%CI) of 0.39(0.21-0.71). Being divorced, husband headed, 7-12 and 13-18 month lactation period, 15-25 and 26-35 years' age were related to preparation convenience of foods

with AOR (95%CI) of 5.94(1.13–31.33), 0.42(0.18–0.96), 3.26(1.34–7.93), 4.4(1.81–10.72), 0.16(0.05–0.47) and 0.25(0.11–0.59). Self-management approaches by nutrition education and promotion to change eating behaviors of women, increasing supply and price regulation toward healthy foods are recommended.

Wolka, K., Biazin, B., Martinsen, V., & Mulder, J. (2021a). Soil and water conservation management on hill slopes in Southwest Ethiopia. I. Effects of soil bunds on surface runoff, erosion and loss of nutrients. *Science of the Total Environment*, 757. Scopus. https://doi.org/10.1016/j.scitotenv.2020.142877

#### Abstract

On the steep hill slopes of southwest Ethiopia, soil erosion may cause significant declines in soil organic carbon (SOC) and nutrients, negatively affecting cropland productivity. Soil bunds are advised as an effective means to reduce surface runoff and soil erosion. However, the effects on SOC and nutrients are rarely quantified. The objective of this study was to assess the quantitative effect of soil bunds on surface runoff as well as soil and nutrients losses from cropland in the region. Data was collected from experimental fields on three farms (fields 1, 2 and 3) in the Omo-Gibe River basin in southwest Ethiopia. On each farm, effects of soil bunds on runoff and erosion were investigated and compared with adjacent plots without soil bunds in the 2018 and 2019 growing seasons. Soil bunds effectively reduced surface runoff (by 80–92%). Without soil bunds, soil losses in the growing season were 5-22 t ha-1 in 2018 and 15-43 t ha-1 in 2019, on average removing 1.3–4 mm soil per year. Soil bunds decreased soil losses by about 96%. Observed soil losses from fields without soil bunds were well described by the Universal Soil Loss Equation (USLE; R2 = 0.92; p < 0.01). Of the total soil loss, 47–69% was removed in suspended form. Suspended material had significantly larger (p < 0.05) SOC, and plant available potassium (K) and phosphorus (P) concentrations than coarser, rapidly settling sediment and bulk soil. In 2019, up to 733 kg SOC ha-1, 77 kg total nitrogen ha-1 and 21 kg K ha-1 were lost per season from plots without soil bunds. For SOC this amounts to 6% of its stocks in the topsoil. Soil bunds are important controls on surface runoff, strongly limiting losses of SOC and nutrients in sloping croplands of southwest Ethiopia.

Wolka, K., Biazin, B., Martinsen, V., & Mulder, J. (2021b). Soil and water conservation management on hill slopes in southwest Ethiopia. II. Modeling effects of soil bunds on surface runoff and maize yield using AquaCrop. *Journal of Environmental Management*, 296. Scopus. https://doi.org/10.1016/j.jenvman.2021.113187

#### Abstract

On the cultivated slopes of the highlands of southwest Ethiopia, soil degradation due to water erosion is a challenge for crop production. To limit surface runoff and soil erosion, soil bunds often in combination with trenches, constructed along contour lines, are common. In addition to the interception of surface runoff, soil bunds may affect crop yield. Here, we evaluate effect of soil bunds on surface runoff and maize yield, using FAO's AquaCrop model, calibrated based on field experiments in the Bokole-Karetha watershed, in SW Ethiopia. Experiments were conducted in 2018 and 2019 on three neighboring fields, each comprising plots in triplicate without and with soil bunds. Experimental data from 2018 to 2019, which were average and above average with respect to rainfall, indicate that water availability was sufficient or even in excess for maize production. Soil bunds significantly (p < 0.05) reduced surface runoff, but maize yield did not differ significantly. In plots without soil bunds, the AquaCrop model described surface runoff satisfactorily after slight adjustment of the curve number (related to infiltration capacity) in one of the three fields. Maize yields were reproduced adequately after calibrating soil fertility and adjusting water productivity. After calibration and validation, the AquaCrop model was used to hindcast surface runoff and grain yield from 1999 to 2017, given available climatic data for the region. Hindcasts show that maize yield in the Bokole-Karetha watershed, with its relatively high rainfall, is not significantly affected by rainfall in two of the three fields. In the third field maize vield decreases slightly, but significantly (p < 0.05) with rainfall. In the short run, yield differences between plots with and without soil bunds are not significant. However, eventually high surface runoff from plots without soil bunds are expected to result in unsustainable crop production, due to significant erosion and degradation of the often nutrient-poor soils. Implementation of soil and water management techniques, combined with fertilization, are important to prevent soil degradation and nutrient stress on sloping land.

Teshome, A., Halefom, A., Teshome, M., Ahmad, I., Taddele, Y., Dananto, M., Demisse, S., & Szucs, P. (2021). Soil erosion modelling using GIS and revised universal soil loss equation approach: A case study of Guna-Tana landscape, Northern Ethiopia. *Modeling Earth Systems and Environment*, 7(1), 125–134. Scopus. https://doi.org/10.1007/s40808-020-00864-0

#### Abstract

An attempt has been made in this study to quantify the soil loss rate in Guna-Tana Landscape, Ethiopia. A Digital Elevation Model (12 m by 12 m spatial resolution), rainfall data over 10 years, soil, and land cover/land use extracted were used as an input to calculate soil loss rates. GIS-based RUSLE factors were integrated and analyzed in the ArcGIS 10.3 plate form. The results showed that 12-monthly loss of soil in the study area ranges from zero in the lower, middle, upper, and steeper slope parts of the watershed to 4735 t/ha/year with a mean annual soil loss of 3627.5 t/ha/year. The overall annual soil loss in the study area is 14,335,517.8 tonnes. Approximately 681.21 ha of the area is within the extreme and very extreme erosion clusters which demand immediate controlling measures.

Wolka, K., Biazin, B., Martinsen, V., & Mulder, J. (2021c). Soil organic carbon and associated soil properties in Enset (Ensete ventricosum Welw. Cheesman)-based homegardens in Ethiopia. *Soil and Tillage Research*, 205. Scopus. https://doi.org/10.1016/j.still.2020.104791

#### Abstract

Enset (Ensete ventricosum Welw. Cheesman)-based homegardens have long been practiced as central elements of agricultural land management and food security in south and southwest Ethiopia. In contrast to the homegardens' biodiversity and role in food security, soil quality has received little attention. Objective of this study was to assess soil quality parameters in typical homegardens in comparison with adjacent croplands, both under continuous management for >30 years. The study was undertaken at high (2200–2330 masl), mid (1799–1849 masl), and low (1349–1381 masl) elevation in the central Omo-Gibe basin, southwest Ethiopia. Through interviews of 49 randomly selected farm households, and soil sampling at six paired sites at high and mid elevations, and five paired sites of low elevation, we found that homegardens received the majority of household waste and manure and were less frequently tilled. By contrast, some,

but not all, croplands occasionally received inorganic fertilizer. Homegarden soil had significantly greater (P < 0.05) soil organic carbon (SOC) concentrations than croplands. At 0–20 cm depth, SOC concentrations in homegardens (22.4–26.4 mg g–1 soil) were twice as high as in croplands (11.5–12.7 mg g-1 soil). Most likely the lower content of SOC in cropland was due to the limited input of organic matter and intensive tillage. The top 60 cm of homegarden soils stored 21–32 Mg ha-1 more SOC than adjacent croplands. Homegardens at high elevation had a significantly greater SOC stock (P &lt; 0.05) than at low elevation. Hot water extractable (labile) organic carbon levels at 0–20 cm in homegardens (540–649 µg g-1 soil) were three to five times greater than in croplands (106–207 µg g-1 soil) and was strongly correlated with the SOC concentration (R2 = 0.85, in homegardens). The fraction of water-stable macro-aggregates (&gt;0.5 mm) was positively correlated with the SOC concentration and significantly greater in homegardens than in cropland. Our results show that traditional homegardens represent a sustainable form of land management and cropping system, enhancing SOC concentration, soil structure and fertility.

### Astatkie, H., Ambelu, A., & Beyene, E. M. (2021). Sources and level of heavy metal contamination in the water of Awetu watershed streams, southwestern Ethiopia. *Heliyon*, 7(3). Scopus. https://doi.org/10.1016/j.heliyon.2021.e06385

#### Abstract

The present study aimed to investigate the contamination source, level, and spatial distribution of globally alarming trace metals from Awetu watershed streams, southwestern Ethiopia. Surface water samples were collected from 20 sampling sites in December 2019. Water samples were collected in 500 ml polyethylene bottles previously washed with deionized water and rinsed with the sample to be collected from different stretches and acidified with 5 ml concentrated nitric acid. The samples were digested with open acid digestion and the contents of the metal were analysed using inductively coupled plasma optical emission spectrometry (ICP-OES) ranged from 18 - 351  $\mu$ g/L for As, 5–19  $\mu$ g/L for Cd, 232–421  $\mu$ g/L for Cr, 314–920  $\mu$ g/L for Pb and 10–16  $\mu$ g/L for Hg. The highest concentrations of As were detected at K3, Cd at K2, Pb and Cr at D4, and Hg at D5. Analysis of variance results revealed that the Cd concentrations were statistically significant among all the streams except for Boye. Streams found at the center of Jimma city with effluents emanated from Jimma University, garage maintenances, car-wash and agricultural areas had higher values than the streams in the periphery. This study concluded that a higher concentration

of trace elements is associated with the type of waste entering the streams. Trace elements concentration in the watershed is to the level that can pose a risk to downstream users. Public awareness creation to establish waste management systems and river quality monitoring should be implemented to minimize the public health risk and deterioration of the aquatic ecosystem.

### Hessebo, M. T., Woldeamanuel, T., & Tadesse, M. (2021). Spatial and temporal climate variability and change in the bilate catchment, central Rift Valley lakes region, Ethiopia. *Physical Geography*, *42*(3), 199–225. Scopus. https://doi.org/10.1080/02723646.2019.1698094

#### Abstract

The paper explores spatial and temporal variability of rainfall and temperature in Bilate catchment based on monthly data of 11 meteorological stations. Precipitation Concentration Index (PCI) and Pearson product moment correlation were used to estimate monthly concentrations and associations between annual and seasonal rainfall. Similar methods were used to analyze the association of ENSO with rainfall variability using Eastern Equatorial Pacific (Niño 3.4) data, Sea Surface Temperature (SST), and Southern Oscillation Index (SOI). Rainfall and temperature series were tested for trends using the Mann–Kendall test. Rainfall in the catchment is highly seasonal and concentrated in Kiremt (June–September), followed by Belg (February–May). Belg rainfall was highly variable. Annual rainfall was relatively stable in the upper catchment and variable in the lower catchment. PCI values are expected to increase as annual and seasonal rainfall. November–March SST is strongly associated with Belg rainfall variations throughout the catchment, and ~49% of the variability can be explained by Equatorial Pacific SST. Annual and seasonal temperature significantly increased in middle and lower parts of the catchment in the past 30 years. Warming was ~0.05°C/yr to 0.17°C/yr.

Aragaw, G., Chala, A., & Terefe, H. (2021). Spatial distribution and association of factors influencing sorghum anthracnose (Colletotrichum sublineolum) epidemics in Eastern Ethiopia. *International Journal of Pest Management*, 67(1), 20–31. Scopus. https://doi.org/10.1080/09670874.2019.1668075

#### Abstract

Sorghum is an important stable food crop in Ethiopia. However, production of the crop is adversely affected by biotic and abiotic constraints among which sorghum anthracnose (Colletotrichum sublineolum) is the major one. A field survey was conducted to determine the distribution and association of sorghum anthracnose with biophysical factors in eastern Ethiopia. A total of 125 fields were assessed in five districts and results revealed that all the surveyed fields were infected with anthracnose. However, significant variations observed in anthracnose intensity across the surveyed districts. Logistic regression was used to analyse the association of sorghum anthracnose with independent variables. High ( $\geq 60\%$ ) disease severity was highly associated with districts Girawa, Tullo and Haramaya, sole cropping system, early sowing date and continuous growing of sorghum. Lower anthracnose severity had a high probability of association with Babile district, residue removal, flowering growth stage, weed control, and rotation of different crops in the field. High distribution of sorghum anthracnose in the study areas requires effective and feasible management options to be developed.

## AkliluToma, S., Senbeta, B. A., & Bezabih, A. A. (2021). Spatial Distribution of Road Traffic Accident at Hawassa City Administration, Ethiopia. *Ethiopian Journal of Health Sciences*, 31(4), 793–806. Scopus. https://doi.org/10.4314/ejhs.v31i4.14

#### Abstract

Background: Globally, road traffic accidents (RTAs) are the leading killer of young people and are projected to be the 7th leading cause of death by 2030. This study is aimed at analyzing the spatial distribution of road traffic accident and identifying hotspot areas across Kebeles (smallest administrative division in Ethiopia) of Hawassa city administration in Ethiopia. Method: Secondary data on daily traffic accident record from October 2013 to June 2018 was obtained from Hawassa city administration police department. The spatial clustering and hotspots identification were carried through Moran's I and Getis-Ord Gi\* statistics. Data analysis was conducted

using GeoDa 1.16.0.0 and ArcGIS 10.2 softwares. Results: Drivers within age group of 18-30 years, who were hired by private business owners and who had no driving license committed the highest number of traffic accidents. The majority of traffic accidents were caused due to careless driving, failure to give priority for pedestrian, high speed and driver failure to give priority for each other. In addition, about 82.01% of traffic accidents were recorded on asphalts road and 11.51% by gravel road. Spatial clustering of road traffic accidents for accidents occurred on gravel road and in sunny weather conditions found to be significant. Different hotspot areas were identified for gravel type of road and sunny weather condition. Conclusion: The concerned government bodies involved in policymaking are recommended to give special attention to young driver who were hired by private business owners. Interventions to mitigate the occurrence of traffic accident would take in to account the identified hotspot areas.

## Toma, S. A., Eneyew, B. W., & Taye, G. A. (2021). Spatial Modelling of Risk Factors for Malaria Prevalence in SNNP Regional State, Ethiopia. *Ethiopian Journal of Health Sciences*, *31*(4), 731–742. Scopus. https://doi.org/10.4314/ejhs.v31i4.7

#### Abstract

#### Background

Malaria is one of the most severe public health problems worldwide with 300 to 500 million cases and about one million deaths reported to date of which 90% were from world health organization (WHO) Sub Saharan Africa (SSA) countries. The purpose of this study was to explore the spatial distribution of malaria parasite prevalence (MPP) among districts of Southern Nations Nationalities and Peoples Regional State (SNNRS) in Ethiopia by using 2011 malaria indicator survey (MIS) data collected for 76 districts and to model its relationship with different covariates. **Method** 

Exploratory spatial data analysis (ESDA) was conducted followed by implementation of spatial lag model (SLM) and spatial error model (SEM) in GeoDa software. Queen contiguity second order type of spatial weight matrix was applied in order to formalize spatial interaction among districts.

#### Results

From ESDA, we found positive spatial autocorrelation in malaria prevalence rate. Hot spot areas for MPP were found in the eastern and southeast parts of the region. Relying on specification

diagnostics and measures of fit, SLM was found to be the best model for explaining the geographical variation of MPP. SLM analysis demonstrated that proportion of households living in earth/local dung plastered floor house, proportion of households living under thatched roof house, average number of rooms/person in a given district, proportion of households who used anti-malaria spray in the last 12 months before the survey, percentage household using mosquito nets and average number of mosquito nets/person in a given district have positive and statistically significant effect on spatial distribution of MPP across districts of SNNPRS. Percentage of households living without access to radio and television has negative and statistically significant effect on spatial distribution of MPP across districts of MPP.

#### Conclusion

Malaria is spatially clustered in space. The implication of the spatial clustering is that, in cases where the decisions on how to allocate funds for interventions needs to have spatial dimension.

Habte, A., Mamo, G., Worku, W., Ayalew, D., & Gayler, S. (2021). Spatial Variability and Temporal Trends of Climate Change in Southwest Ethiopia: Association with Farmers' Perception and Their Adaptation Strategies. *Advances in Meteorology*, 2021. Scopus. https://doi.org/10.1155/2021/3863530

#### Abstract

The impact of climate change is a global threat, and its effect is more pronounced in developing countries. It is vital to link physical data analysis with endogenous knowledge and practices of farmers to strengthen their adaptive capacity. This study was conducted to explore spatial variability and temporal trends of temperature and rainfall in association with farmers' perceptions and their adaptation strategies in Southwest Ethiopia. Daily rainfall and temperature data of twelve weather stations were collected from the National Meteorological Agency of Ethiopia for the period 1983 to 2016. Farmers' perceptions about climate change and its impact and their adaptation strategies were assessed through a survey. Spatial variability and temporal trends of rainfall and temperature were analyzed using ArcGIS and R software. Sen's slope estimator and Mann-Kendall's trend tests were used to detect the magnitude and statistical significance of changes in rainfall and temperature. Spatial analysis of rainfall showed high variability over the region. There were no consistent and significant temporal

trends of annual and seasonal rainfall of the area. Significant and upward trends of annual maximum and minimum temperatures were reported for all stations. Accordingly, annual maximum and minimum temperatures were increased by 0.71 and 0.65°C, respectively, over the period 1983 to 2016. Farmers had a good awareness of climate change and its impact. Adaptation strategies used by farmers included soil and water conservation practices (66.21%), crop diversification (62.16%), modifying planting date (42.56%), agroforestry practices (35.13%), use of drought-tolerant variety (33.95%), use of early maturing crop (27.03%), and livelihood diversification (25.42%). As most of these adaptation strategies were familiarized by a small number of farmers, further effort is needed to identify factors limiting the adoption of these strategies. Furthermore, additional planned strategies and supports that widen available options at the farmers' disposal should be introduced to strengthen their adaptive capacity.

## Wolka, K., Biazin, B., Martinsen, V., & Mulder, J. (2021d). Spatial variation in soil properties and crop yield on stone bund terraces in southwest Ethiopia. *Soil Use and Management*. Scopus. https://doi.org/10.1111/sum.12777

#### Abstract

Erosion and associated soil degradation are major threats to cropland productivity on the steep slopes of the Ethiopian highlands. To limit erosion from cultivated land on sloping terrain, stone bunds for soil conservation have been used for decades, resulting in the formation of terraces. Although qualitatively well known, the difference in soil properties and crop performance between the upper and lower sections of the terraces (intra-bund areas) has not been documented quantitatively. Here, we assess differences in soil properties of the plough layer and crop performance in the upper and lower sections of terraces in between stone bunds in southwest Ethiopia. A total of 27 terraces, with a length of 28.5–57 m and a distance of 6.5–14.7 m in between adjacent stone bunds, were sampled on six different farms during the 2018 and 2019 cropping seasons. The difference in soil properties was analysed using analysis of variance (ANOVA). Results showed that, in the lower section of a terrace, the concentration of soil organic carbon (18.6 g kg–1), total soil nitrogen (2.1 g kg–1) and exchangeable potassium (328 mg kg–1) was significantly greater (p <.01) than in the upper section. Also, grain yield and biomass of maize, teff, broad bean and sorghum were significantly greater (p &lt;.05) in the lower section. This was

particularly true for maize for which the yield in 2018 increased from 0.7 t ha-1 in the upper sections to 2.6 t ha-1 in the lower sections. Optimizing crop yields on terraces requires adaptive fertilizer application and crop choice.

Belayneh, M., Loha, E., & Lindtjørn, B. (2021). Spatial variation of child stunting and maternal malnutrition after controlling for known risk factors in a drought-prone rural community in Southern Ethiopia. *Annals of Global Health*, 87(1). Scopus. https://doi.org/10.5334/aogh.3286

#### Abstract

#### Background

Globally, understanding spatial analysis of malnutrition is increasingly recognized. However, our knowledge on spatial clustering of malnutrition after controlling for known risk factors of malnutrition such as wealth status, food insecurity, altitude and maternal characteristics is limited from Ethiopia. Previous studies from southern Ethiopia have shown seasonal patterns of malnutrition, yet they did not evaluate spatial clustering of malnutrition.

#### Objective

The aim of this study was to assess whether child stunting and maternal malnutrition were spatially clustered in drought-prone areas after controlling for previously known risk factors of malnutrition. Methods: We used a community-based cohort study design for a one-year study period. We used SaTScan software to identify high rates of child stunting and maternal malnutrition clustering. The outcome based was the presence or absence of stunting and maternal malnutrition ([BMI] <18.5 kg/m2). We controlled for previously known predictors of child stunting and maternal malnutrition to evaluate the presence of clustering. We did a logistic regression model with declaring data to be time-series using Stata version 15 for further evaluation of the predictors of spatial clustering. **Results** 

The crude analysis of SaTScan showed that there were areas (clusters) with a higher risk of stunting and maternal malnutrition than in the underlying at risk populations. Stunted children within an identified spatial cluster were more likely to be from poor households, had younger and illiterate mothers, and often the mothers were farmers and housewives. Children identified within the most likely clusters were 1.6 times more at risk of stunting in the unadjusted analysis. Similarly, mothers within the clusters were 2.4 times more at risk of malnutrition in the unadjusted analysis. However,

after adjusting for known risk factors such as wealth status, household food insecurity, altitude, maternal age, maternal education, and maternal occupation with SaTScan analysis, we show that child stunting and maternal malnutrition were not spatially clustered.

#### Conclusion

The observed spatial clustering of child stunting and maternal malnutrition before controlling for known risk factors for child stunting and maternal malnutrition could be due to non-random distribution of risk factors such as poverty and maternal characteristics. Moreover, our results indicated the need for geographically targeted nutritional interventions in a drought-prone area.

### Gashure, S., & Wana, D. (2021). Spatiotemporal climate variability and trends in UNESCO designated Cultural Landscapes of Konso, Ethiopia. *African Geographical Review*. Scopus. https://doi.org/10.1080/19376812.2021.1997611

#### Abstract

Understanding spatiotemporal patterns of climate variability and trends is essential to designing context-specific adaptation and mitigation interventions for climate change impacts. To this end, this paper examines the 1983–2016 rainfall and temperature variability and trends using merged satellite-gauge station data in the UNESCO designated Cultural Landscapes of Konso, Ethiopia. We have employed a non-parametric Mann-Kendall test to analyze rainfall and temperature trends, whereas the coefficient of variation (CV) has been used for variability analysis. The distribution and severity of meteorological droughts were mapped using the Standardized Precipitation Index (SPI). Our findings revealed an increase in annual and summer (Kiremt) season rainfall by 3.16 mm and 0.42 mm per year, respectively. However, rainfall in the spring (Belg) season decreased by 1.12 mm per year. Our findings also showed a substantial spatiotemporal variability in drought events due to variations in rainfall and topography. Consequently, the observed increase in frequency and the spatial extent of drought pose potential threats to rainfed farming, which gradually exposes smallholders to food insecurity and socioeconomic vulnerability. Therefore, agroecological-based local adaptation and mitigation interventions to climate variability are needed to enhance the resilience of smallholder farmers and ensure the continuity of the Konso cultural landscapes.

Legesse, A., & Negash, M. (2021). Species diversity, composition, structure and management in agroforestry systems: The case of Kachabira district, Southern Ethiopia. *Heliyon*, 7(3). Scopus. https://doi.org/10.1016/j.heliyon.2021.e06477

#### Abstract

Agroforestry is increasingly being identified as an integrated land use enhancing plant diversity while reducing habitat loss and fragmentation. This paper examined species diversity, composition, structure and management in agroforestry systems. Two Kebeles (Kachabira and Mesafe) were purposively selected for this study. Then, farmers who dominantly practiced agroforestry practices such as home garden, parkland and live fence were stratified based on wealth categories. Ten percent of the sample households were randomly selected from each wealth category. Accordingly, a total of 83 households were selected. Inventories of plant species were done by sampling one plot of each farm management type. A total of 59 plant species, belonging to 56 genera and 36 families were recorded across the home gardens, parklands and live fences in the study area. Among the plant species, trees constituted 42%, shrubs 27%, herbs 29% and climber 2%. From recorded plant species, 66% were native and the remainders 34% were introduced species. From the native species recorded in this study, Lippia adoensis and Millettia ferruginea were endemic to Ethiopia. The mean Shannon diversity index of rich, medium and poor households in the three different agroforestry practices were 1.75, 1.57 and 1.62 in home garden, 0.36, 0.30 and 0.49 in parkland and 0.84, 0.99 and 1.00 in live fence respectively. The largest tree basal area was recorded in the live fence (14.7 m2ha-1), followed by home garden and parkland. The study revealed that agroforestry plays an important role in the conservation of biodiversity, and also by providing food, income and a wide range of other products such as fuel wood, construction material, fodder, spices and medicinal plants. Farm household landholding size, species preference and management found to be the most important influencing factors that affect the diversity of plant species. Further detailed study of explicit examining of the factors such as socio-ecological effects that determine species diversity and the contribution of different functional groups to livelihood is needed to fully understand the agroforestry system.

Delelegn, D., Tolcha, A., Beyene, H., & Tsegaye, B. (2021). Status of active trachoma infection among school children who live in villages of open field defecation: A comparative cross-sectional study. *BMC Public Health*, *21*(1). Scopus. https://doi.org/10.1186/s12889-021-12106-8

#### Abstract

#### Background

Although many efforts are made by different stakeholders, magnitude of active trachoma remains high among children in Ethiopia. Open field defecation was found to be the main source of active trachoma. However, comparative information on the effect of open field defecation and non-open field defecation on active trachoma is scarce in Ethiopia.

#### Methods

Comparative community based cross-sectional study was conducted from June 1–30, 2019 in Boricha and Dale districts to assess prevalence of active trachoma among primary school children. We have selected four primary schools purposively from two districts in Sidama. Study participants were selected by using simpe random sampling method. Data were collected through face to face interview, direct observation and ophthalmic examination. Logistic regression analysis was conducted to assess factors associated with active trachoma infection among primary school children. Adjusted Odds Ratios with 95% confidence interval and p-value less than 0.05 were computed to determine the level of significance.

#### Result

From the total of 746 study participants, only 701 study participants gave full response for interview questions making a response rate of 94%. The overall prevalence of active trachoma infection was 17.5% (95% CI, 14.1–20.8) among primary school students. Specifically, prevalence of active trachoma infection was 67.5% among children who lived in open field defecation villages, but it was 88.5% among school children who live in Non-ODF Kebeles. Factors like: Living in open field defecation Kebeles (AOR = 2.52, 95% CI, 1.5-4.1), having ocular discharge (AOR = 5.715, 95% CI, 3.4-9.4), having nasal discharge (AOR = 1.9, 95% CI, 1.06-3.39), and fly on the face (AOR = 6.47, 95% CI, 3.36-12.44) of children were positively associated with active trachoma infection. However, finger cleanness (AOR = 0.43, 95% CI, 0.21-0.9) was protective factor against active trachoma infection in this study.

#### Conclusion

Significant variation in prevalence of active trachoma infection among school children between open filed and non-open field defecation Kebeles was observed. Surprisingly, the prevalence in open field defecation was significantly lower than non-open field defecation. Hence, this indicates active trachoma infection highly depends on the hand hygiene than environmental sanitation. Educational campaign of hand hygiene should be enhanced in the community for school students.

#### Degsera, A., Minwyelet, M., & Yosef, T. G. (2021). Stock assessment of Nile tilapia Oreochromis niloticus (Linnaeus 1758) in Lake Tana, Ethiopia. *African Journal of Aquatic Science*, 46(4), 499–507. Scopus. https://doi.org/10.2989/16085914.2021.1922349

#### Abstract

Nile tilapia Oreochromis niloticus is a commercially important fish species in the Lake Tana fishery and contributes to 65% of the total annual catch. This study estimated the maximum sustainable yield (MSY) and effort at maximum sustainable yield (fMSY) for the O. niloticus fishery using the Thompson and Bell yield prediction model. Catch and effort data from four representative landing sites were collected daily from June 2016 to May 2017 and used to estimate the total mortality coefficient (Z) using catch curve analysis, natural mortality (M) using Pauly's empirical formula, and fishing mortality (F) as F = Z - M. Population abundance was evaluated using the Jones length-based cohort analysis model. The estimated Z, M and F values were 1.1, 0.52, and 0.49 per year, respectively. In total, 5 077 tons of O. niloticus were produced, which exceeds the MSY of 4 904 tons per year that could be obtained from the fishery at an F0.1. Consequently, the recommendation is to reduce the fishing effort by 15%. Collection of catch-and-effort data from more landing sites, over an extended period, could improve the yield estimates and this should be considered in conjunction with a bioeconomic analysis in future.

Ponraj Sankar, L., Aruna, G., Sathish, T., Parthiban, A., Vijayan, V., Dinesh Kumar, S., Rajkumar, S., Mekonnen, A., & Tufa, M. (2021). Strength Enhancement Study on Composites of AA6066 Aluminium Alloy with Magnesium Oxide and Coal Ash. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/2810106

#### Abstract

Aluminium alloy is the most favourable material based on the various properties and economic factors. Always there are so many researches going on based on the enhancement of the material properties with various combinations and the various materials mixing rate depending upon the availability. These researches were focused on the augmentations of the properties, and then the corresponding properties can be used in the various applications depending upon the results. In this study, the AA6066 aluminium alloy composites were created with the magnesium oxide and coal ash with a variety of grouping. The specimens were named as AAMgOCA 1 to AAMgOCA 6 with respect to the volume concentration composition. Then, the composites were tested to identify the impact on various strengths such as yield strength, ultimate tensile strength, shear strength, and flexural strength. These strengths were compared with the two conditions of the composites such as annealed and heat-treated conditions. AAMgOCA 3 has the greatest results in heat-treated condition when compared with the annealed condition.

Tilahun, B., Gashu, K. D., Mekonnen, Z. A., Endehabtu, B. F., Asressie, M., Minyihun, A., Mamuye, A., Atnafu, A., Ayele, W., Gutema, K., Abera, A., Abera, M., Gebretsadik, T., Abate, B., Mohammed, M., Animut, N., Belay, H., Alemu, H., Denboba, W., ... Tadesse, L. (2021). Strengthening the national health information system through a capacity-building and mentorship partnership (CBMP) programme: A health system and university partnership initiative in Ethiopia. *Health Research Policy and Systems*, 19(1). Scopus. https://doi.org/10.1186/s12961-021-00787-x

#### Abstract

#### Background

A strong health information system (HIS) is one of the essential building blocks for a resilient health system. The Ministry of Health (MOH) of Ethiopia is working on different initiatives to strengthen the national HIS. Among these is the Capacity-Building and Mentorship Partnership (CBMP) Programme in collaboration with public universities in Ethiopia since November 2017.

This study aims to evaluate the outcomes and share experiences of the country in working with universities to strengthen the national HIS.

#### Methods

The study employed a mixed-methods approach that included 247 health organizations (health offices and facilities) of CBMP-implementing woredas (districts) and 23 key informant interviews. The programme focused on capacity-building and mentoring facilities and woreda health offices. The status of HIS was measured using a connected woreda checklist before and after the intervention. The checklist consists of items related to HIS infrastructure, data quality and administrative use. The organizations were classified as emerging, candidate or model based on the score. The findings were triangulated with qualitative data collected through key informant interviews.

#### Results

The results showed that the overall score of the HIS implementation was 46.3 before and 74.2 after implementation of the programme. The proportion of model organizations increased from 1.2% before to 31.8% after the programme implementation. The health system–university partnership has provided an opportunity for higher education institutions to understand the health system and tune their curricula to address real-world challenges. The partnership brought opportunities to conduct and produce local- and national-level evidence to improve the HIS. Weak ownership, poor responsiveness and poor perceptions of the programme were mentioned as major challenges in programme implementation.

#### Conclusion

The overall HIS has shown substantial progress in CBMP implementation woredas. A number of facilities became models in a short period of time after the implementation of the programme. The health system–university partnership was found to be a promising approach to improve the national HIS and to share the on-the-ground experiences with the university academicians. However, weak ownership and poor responsiveness to feedback were the major challenges identified as needing more attention in future programme implementation.

Zeleke, M. A., Dintwa, E., & Nwaigwe, K. N. (2021). Stress intensity factor computation of inclined cracked tension plate using xfem. *Engineering Solid Mechanics*, 9(4), 363–376. Scopus. https://doi.org/10.5267/J.ESM.2021.7.002

#### Abstract

One of the major successes in the field of Linear Elastic Fracture Mechanics (LEFM) is the groundwork of the stress intensity factor (SIF) computation. The approaches used to carry out SIF values may be analytical, semi-analytical, experimental or numerical. Each one of the above methods has its own benefits however the use of numerical solutions has become the most frequent and popular. Numerous schemes for the numerical computation of SIF have been developed, the J-integral method being the most popular one. In this article we examine the SIFs of an edge cracked two dimensional (2-D) steel plate subjected to tensile loading. Extended finite element (XFEM) computational scheme has been employed to estimate the values of SIF. The SIF values of cracks with different lengths and inclination angles (different configurations) have been examined by utilizing the domain based interaction integral approach. The effect of crack inclination and crack position on SIFs (KI and KII) has also been studied. The results obtained in this study were compared with those from literature and theoretical values and observed that they are in close agreement.

Noulèkoun, F., Birhane, E., Mensah, S., Kassa, H., Berhe, A., Gebremichael, Z. M., Adem, N. M., Seyoum, Y., Mengistu, T., Lemma, B., Hagazi, N., & Abrha, H. (2021). Structural diversity consistently mediates species richness effects on aboveground carbon along altitudinal gradients in northern Ethiopian grazing exclosures. *Science of the Total Environment*, 776. Scopus. https://doi.org/10.1016/j.scitotenv.2021.145838

#### Abstract

Grazing exclosures have been promoted as an effective and low-cost land management strategy to recover vegetation and associated functions in degraded landscapes in the tropics. While grazing exclosures can be important reservoirs of biodiversity and carbon, their potential in playing a dual role of conservation of biodiversity and mitigation of climate change effects is not yet established. To address this gap, we assessed the effect of diversity on aboveground carbon (AGC) and the

relative importance of the driving biotic (functional diversity, functional composition and structural diversity) and abiotic (climate, topography and soil) mechanisms. We used a dataset from 133 inventory plots across three altitudinal zones, i.e., highland, midland and lowland, in northern Ethiopia, which allowed local- (within altitudinal zone) and broad- (across altitudinal zones) environmental scale analysis of diversity-AGC relationships. We found that species richness-AGC relationship shifted from neutral in highlands to positive in mid- and lowlands as well as across the altitudinal zones. Structural diversity was consistently the strongest mediator of the positive effects of species richness on AGC within and across altitudinal zones, whereas functional composition linked species richness to AGC at the broad environmental scale only. Abiotic factors had direct and indirect effects via biotic factors on AGC, but their relative importance varied with altitudinal zones. Our results indicate that the effect of species diversity on AGC was altitude-dependent and operated more strongly through structural diversity (representing niche complementarity effect) than functional composition (representing selection effect). Our study suggests that maintaining high structural diversity and managing functionally important species while promoting favourable climatic and soil conditions can enhance carbon storage in grazing exclosures.

## Markos, M., Kefyalew, B., & Tesfaye, H. B. (2021). Studies on the prevalence of blindness in Ethiopia: A protocol for the systematic review and meta-analysis. *BMJ Open Ophthalmology*, *6*(1). Scopus. https://doi.org/10.1136/bmjophth-2021-000881

#### Abstract

#### Introduction

Blindness refers to a lack of vision and/or defined as presenting visual acuity worse than 3/60 in the better eye. Its highest proportion has been conforming to the developing countries such as Ethiopia. So, timely information is crucial to design strategies. However, the study on the magnitude of blindness in Ethiopia was outdated, that means it was conducted in 2005-2006. Therefore, this protocol has been proposed to estimate the pooled prevalence of blindness in Ethiopia to provide up-to-date, comprehensive evidence on this theme.

#### Methods and analysis

The following databases will be used to search articles: PubMed, Cochrane Library, Google Scholar and retrieving references. Standard data extraction approach will be employed and

presented using Preferred Reporting Items for Systematic Review and Meta-Analysis. The Newcastle-Ottawa Scale quality assessment tool will be used to evaluate the quality of studies. Analysis will be held using STATA V.11. Funnel plot and Egger& aposs regression test will be applied to check for the potential sources of bias. Heterogeneity among the studies will be tested using Higgins method in which I<sup>2</sup> statistics will be calculated and compared with the standard. Meta-regression and subgroup analysis will be done to identify the potential sources of heterogeneity. Cross-sectional and survey studies conducted in Ethiopia and published in English language will be included. Ethics and dissemination Ethics approval and consent are not required. On completion, the result will be submitted to a reputable peer-reviewed journal. Trial registration number CRD42021268448.

## Tufa, M., Tafesse, D., Tolosa, S., & Murgan, S. (2021). Study of sand-plastic composite using optimal mixture design of experiments for best compressive strength. 47, 480–487. Scopus. https://doi.org/10.1016/j.matpr.2021.05.031\_Conference)

Nowadays Plastic wastes are a major environmental concern and free raw materials that can be converted to useful product. By this study, those free raw materials of waste plastics are collected and recycled to produce sand plastic composite brick (SPCB). SPCB of characteristic similar to conventional sand-cement brick was produced using simple technology of compression molding by melt blending technique. Best possible mixture composition of sand and plastic weight percentage for higher compressive strength is determined using optimum mixture design of experiment (DOE). Using Design Expert software, a quadratic model was setup as function of the Sand-Plastic Composite element weight percentage. The setup model was confirmed experimentally through ANOVA table and fit summary. Diagnostic case statics and graphical representations of the model were also investigated by using adjusted R-Squared, predicted R-Squared, DFFITS and Cook's D graphs. In addition, the effects of sand and plastic weight percentage on compressive strength variation were also studied. Finally, optimum percentage of mixtures of sand and plastic that would yield maximum compressive strength is predicted from analysis of graph. Maximum compressive strength about 4.95 N/mm2was obtained when the plastic weight percent of 60% (40 wt% LDPE and 20 wt% HDPE) was melt blended with sand weight percent of 40% (25% of sand size of 1.18 mm and 15% of sand size 0.5 mm). When waste plastic content was greater than 70%; it affects the response negatively this was result from the impurities content. Sand has negative effect on compressive strength when its wt. % is greater than 42% this was due to pore created in sample of SPC that result from non-coherent mix of plastic and sand. The authors concluded that, inventions like SPCB from waste plastics have many environmental and cost advantages. So, mixture Design of Experiment can be used as an alternative mixture design method in order to get better mechanical property product of sand plastic composites.

## Sathish, T., Mohanavel, V., Karthick, A., Arunkumar, M., Ravichandran, M., & Rajkumar, S. (2021). Study on Compaction and Machinability of Silicon Nitride (Si3N4) Reinforced Copper Alloy Composite through P/M Route. *International Journal of Polymer Science*, 2021. Scopus. https://doi.org/10.1155/2021/7491679

#### Abstract

Nowadays, most of the products are used in the electrical and electronics field, and copper alloy is playing a significant role such as Springs for relay contacts and switchgear, Rotor bars, and Busbars. In this work, the copper alloys consider as base alloy, and the reinforced factor of silicon nitride (Si3N4) is processed of reinforcement as 3 wt. %, 6 wt. %, 9 wt. %, 12 wt. % Si3N4 through powder metallurgy performance. The ball mill process is used for this work to obtain an enhanced homogeneous mixture of both base material as well as reinforced particles. Using a hydraulic press, the blended powders are compacted with applying 3 kN and 10 min period for obtained good strength of green compact specimens. Further, the green compacted specimens are sintered, and the sintered billets are machined in the conventional lathes with different cutting speeds 50 m/min, 100 m/min, and 150 m/min; feed rate of 0.1 mm/rev (fixed); and depth of cut of 0.5 mm, 0.8 mm, 1 mm, 1.2 mm, 1.4 mm, and 1.6 mm. Cutting speed and depth of cut to find the composites' cutting force is ingenious. A wear test also can be conducted to find the wear resistance of the reinforced particles of the copper alloy material.

Afework, E., Mengesha, S., & Wachamo, D. (2021). Stunting and Associated Factors among Under-Five-Age Children in West Guji Zone, Oromia, Ethiopia. *Journal of Nutrition and Metabolism*, 2021. Scopus. https://doi.org/10.1155/2021/8890725

#### Abstract

#### Background

Stunting is one of the most important public health problems in Ethiopia. It remains a problem of greater magnitude particularly in rural and low-income areas. It reflects chronic nutritional deficiencies and illness that occur during the most critical periods for growth and development in early life. It needs proper intervention to save the future, unless it resulted in diminished cognitive and physical development for the rest of their lives. Therefore, this study aimed to assess the prevalence of stunting and associated factors among under-five children in West Guji Zone, Oromia, Ethiopia.

#### Method

A community-based cross-sectional study was conducted among 767 under-five children who were included in this study by using a multistage sampling technique in 12 kebeles from 3 selected districts. Data were collected from a mother/caregiver of the child by using a structured pretested questionnaire. Standardized anthropometric measurements were used to measure length, weight, and height of a child. Data were entered into Epi Info software version 3.5.1 and exported to SPSS version 23 for analysis for descriptive and logistic regression models.

#### Result

The prevalence of stunting was 244 (31.8%) with 95% CI (28.6-35.2) among under-five-age children. The under-five children whose fathers had a polygamous marriage (AOR = 4.92, 95% CI: 3.46, 7.00), being female sex (AOR = 1.74, 95% CI: 1.23, 2.47), having below 4 meal frequencies (AOR = 2.95, 95% CI: 1.56, 5.58), not vaccinated (AOR = 1.75, 95% CI: 1.15, 2.67), and from poor households' wealth status (AOR = 3.03, 95% CI: 1.63, 5.63) and also from severely food insecure household (AOR = 2.92, 95% CI: 1.36, 6.24) were short for their age compared with their counterparts.

#### Conclusion

Nearly one-third of the under-five children were stunted in the study area which needs intervention on child-feeding practice to avoid sex discrimination in the community. In addition to this health officials in collaboration with other sectors, it is needed to act together to improve enforcement of the law for polygamous marriage, the household's wealth status, and food security for the better health of a child and future.

Wolde Hawariat, B. Y., Fenta, B. D., & Gebreselassie, H. A. (2021). Subcutaneous chest wall hamartoma: Case report. *Journal of Pediatric Surgery Case Reports*, 73. Scopus. https://doi.org/10.1016/j.epsc.2021.102009

#### Abstract

#### Background

Chest wall hamartoma is one of the rare findings in the practice of pediatrics surgery. The usual origin of chest wall hamartoma in literature are the ribs. Here we report a very rare case of hamartoma arising from the subcutaneous tissue of the chest wall.

#### **Case summary**

A 3 years old female child presented with painless chest wall swelling of 1 year duration. On examination, the mass was soft-firm, nontender and mobile measuring 5cm by 7 cm and located on the posterolateral chest. Chest x-ray showed soft tissue mass otherwise no rib abnormality. She was operated with a finding of solid mass with multi cystic component in the subcutaneous tissue with no extension to the ribs or the underlying muscles with clear margin of demarcation. Mass was completely excised and sent for pathology examination which showed hamartomatous lesion. Our patient has smooth post-operative course and discharged on her 5th post-operative day.

#### Conclusion

Although chest wall hamartoma not arising from the rib is a very rare finding, it can mimic several benign and malignant lesions arising from the chest wall. Hence, preoperative imaging and proper pathologic evaluation are important to differentiate it from other masses.

Abate, D. A., Ayele, M. H., & Mohammed, A. B. (2021). Subcutaneous mycoses in Ethiopia: A retrospective study in a single dermatology center. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 115(12), 1468–1470. Scopus. https://doi.org/10.1093/trstmh/trab080

#### Abstract

#### Background

The magnitude of various types of subcutaneous mycoses in Ethiopia is unknown. Methods: We performed a 5-y retrospective review of confirmed cases at ALERT hospital dermatology clinics.

#### Result

Confirmed cases of subcutaneous mycoses included chromoblastomycosis (n=12) and mycetoma (n=8). The patients originated from four regions: Oromia (n=10), Amhara (n=6), Addis Ababa (n=3) and South (n=1). Males were affected in 75% of cases (15/20). Ages ranged from 19 to 66 y with a median age of 44 y. Duration of disease ranged from 1 to 25 y. Extremities were affected in all cases, with lower limb involvement in 85% (17/20).

#### Conclusion

Chromoblastomycosis was the most frequent subcutaneous mycosis followed by mycetoma.

Sartorius, B., VanderHeide, J. D., Yang, M., Goosmann, E. A., Hon, J., Haeuser, E., Cork, M. A., Perkins, S., Jahagirdar, D., Schaeffer, L. E., Serfes, A. L., LeGrand, K. E., Abbastabar, H., Abebo, Z. H., Abosetugn, A. E., Abu-Gharbieh, E., Accrombessi, M. M. K., Adebayo, O. M., Adegbosin, A. E., ... Dwyer-Lindgren, L. (2021). Subnational mapping of HIV incidence and mortality among individuals aged 15–49 years in sub-Saharan Africa, 2000–18: A modelling study. *The Lancet HIV*, 8(6), e363–e375. Scopus. https://doi.org/10.1016/S2352-3018(21)00051-5

#### Abstract

#### Background

High-resolution estimates of HIV burden across space and time provide an important tool for tracking and monitoring the progress of prevention and control efforts and assist with improving the precision and efficiency of targeting efforts. We aimed to assess HIV incidence and HIV mortality for all second-level administrative units across sub-Saharan Africa.

#### Methods

In this modelling study, we developed a framework that used the geographically specific HIV prevalence data collected in seroprevalence surveys and antenatal care clinics to train a model that estimates HIV incidence and mortality among individuals aged 15–49 years. We used a model-based geostatistical framework to estimate HIV prevalence at the second administrative level in 44 countries in sub-Saharan Africa for 2000–18 and sought data on the number of individuals on antiretroviral therapy (ART) by second-level administrative unit. We then modified the Estimation and Projection Package (EPP) to use these HIV prevalence and treatment estimates to estimate HIV incidence and mortality by second-level administrative unit.

#### Findings

The estimates suggest substantial variation in HIV incidence and mortality rates both between and within countries in sub-Saharan Africa, with 15 countries having a ten-times or greater difference in estimated HIV incidence between the second-level administrative units with the lowest and highest estimated incidence levels. Across all 44 countries in 2018, HIV incidence ranged from 2.8 (95% uncertainty interval 2.1-3.8) in Mauritania to 1585.9 (1369.4–1824.8) cases per 100 000 people in Lesotho and HIV mortality ranged from 0.8 (0.7-0.9) in Mauritania to 676.5 (513.6–888.0) deaths per 100 000 people in Lesotho. Variation in both incidence and mortality was substantially greater at the subnational level than at the national level and the highest estimated rates were accordingly higher. Among second-level administrative units, Guijá District, Gaza Province, Mozambique, had the highest estimated HIV incidence (4661.7 [2544.8-8120.3]) cases per 100 000 people in 2018 and Inhassunge District, Zambezia Province, Mozambique, had the highest estimated HIV mortality rate (1163.0 [679.0–1866.8]) deaths per 100 000 people. Further, the rate of reduction in HIV incidence and mortality from 2000 to 2018, as well as the ratio of new infections to the number of people living with HIV was highly variable. Although most secondlevel administrative units had declines in the number of new cases (3316 [81.1%] of 4087 units) and number of deaths (3325 [81.4%]), nearly all appeared well short of the targeted 75% reduction in new cases and deaths between 2010 and 2020.

#### Interpretation

Our estimates suggest that most second-level administrative units in sub-Saharan Africa are falling short of the targeted 75% reduction in new cases and deaths by 2020, which is further compounded by substantial within-country variability. These estimates will help decision makers and

programme implementers expand access to ART and better target health resources to higher burden subnational areas. Funding: Bill & Melinda Gates Foundation.

Ayalew, M., Defar, S., & Reta, Y. (2021). Suicide behavior and its predictors in patients with schizophrenia in ethiopia. *Schizophrenia Research and Treatment*, 2021. Scopus. https://doi.org/10.1155/2021/6662765

#### Abstract

#### Background

People with schizophrenia (PWS) are at greater risk of suicide. However, suicide behaviors that occur in PWS are often overlooked, inadequately characterized, and not consistently integrated into treatment. Despite this burden and consequences in Ethiopia, there is a dearth of studies concerning suicide behavior in PWS. Therefore, this study is aimed at assessing the magnitude of suicide behavior and its predictors among PWS in Ethiopia.

#### Methods

An institution based cross-sectional study was employed. Data were collected using the structured interviewer-administered questionnaire from a sample of 300 PWS at Amanuel Mental Specialized Hospital (AMSH). The revised version of Suicide Behavior Questionnaire (SBQ-R) was used to assess suicide behavior in PWS. The data was collected from March 1 to 30, 2019. Binary logistic regression was performed to identify independent predictors of suicidal behavior at 95% confidence level. Statistical significance was declared at p value <0.05.

#### Result

A total of 300 patients with schizophrenia participated in the study. More than two-thirds of 203 (67.7%) of the participants were males, and 116 (38.7%) participants were between the ages of 28 and 37 years. We found that the prevalence of suicide behavior among PWS was 30.3%. Being unemployed (AOR = 3.65, CI = 1.32, 10.05), family history of suicide (AOR = 3.16, CI = 1.38, 7.23), substance use (AOR = 2.51, CI = 1.13, 5.59), current positive psychotic symptoms (hallucination (AOR = 6.39, CI = 2.86, 14.29), and delusion (AOR = 4.15, CI = 1.95, 14.29) and presence of comorbid depression (AOR = 4.81, CI = 1.98, 11.68) were independent significant predictors with suicidal behavior in PWS.

#### Conclusion

The prevalence of suicidal behavior among PWS was found to be high. Hence, designing strategies for early screening and intervention is the most critical prevention strategy of suicide in PWS.

Bang, S., Tanga, B. M., Qamar, A. Y., Fang, X., Seong, G., Talha Nabeel, A. H., Yu, I., & Cho, J. (2021). Supplementation of cryoprotective extender with resveratrol decreases apoptosis index and reactive oxygen species levels in post-thaw dog sperm. *Korean Journal of Veterinary Research*, *61*(4). Scopus. https://doi.org/10.14405/kjvr.2021.61.e29

#### Abstract

Resveratrol (RSV, 3,5,4'-trihydroxytrans-stilbene) protects sperm from cryo-induced damage in various animal and human species. In this study, we aimed to assess the effect of dog sperm cryoprotective extender containing RSV on the quality of post-thaw dog sperm. Sperm were collected from 4 Beagles and supplemented with different concentrations of RSV (0, 100, 200, and 400  $\mu$ M). After thawing, apoptosis index, and reactive oxygen species (ROS) levels were assessed to determine post-thaw sperm quality. Dog sperm cryopreserved with 400  $\mu$ M RSV showed significant improvement in post-thaw sperm quality with lower apoptosis index and ROS levels (p < 0.05). Our results showed that the supplementation of dog sperm cryoprotective extender with RSV at a concentration of 400  $\mu$ M improved the post-thaw dog sperm quality in the term of sperm ROS production and apoptosis. In addition, we emphasize the necessity of testing the ROS levels and apoptosis index using flow cytometry to determine the quality of post-thaw semen.

## Dessie, Y., Tadesse, S., & Eswaramoorthy, R. (2021). Surface Roughness and Electrochemical Performance Properties of Biosynthesized α -MnO2/NiO-Based Polyaniline Ternary Composites as Efficient Catalysts in Microbial Fuel Cells. *Journal of Nanomaterials*, 2021. Scopus. https://doi.org/10.1155/2021/7475902

#### Abstract

In this study, biosynthesized  $\alpha$ -MnO2/NiO NPs and chemically oxidative polyaniline (PANI) were synthesized to form ternary composite anode material for MFC. The synthesized materials were characterized with different materials (UV-Vis, FTIR, XRD, TGA-DTA-DSC, SEM-EDX-Gwyddion, CV, and EIS) to deeply examine their optical, structural, morphological, thermal, roughness, and electrocatalytic properties. The degree of surface roughness for  $\alpha$ - MnO2/NiO/PANI was 23.65 $\pm$ 5.652 nm. This value was higher than the pure  $\alpha$ -MnO2, pure PANI, and even  $\alpha$ -MnO2/PANI nanocomposite due to surface modification. The total charge storing performance for bare PGE, a-MnO2/PGE, PANI/PGE, a-MnO2/PANI/PGE, and a-MnO2/NiO/PANI/PGE were 5.291, 17.267, 20.659, 23.258, and 24.456 mC. From this, the charge storing performance formed by α-MnO2/NiO/PANI-modified PGE was highest, indicating that this electrode is best in cycle stability and increases its life cycle during energy conversion time in MFC. This is also supported by its effective surface area, having a value of 0.00984 cm2. From this, it is evidenced that the ternary composite catalyst-modified anode facilitates the fast electrocatalytic activity as observed from its high peak current and lower peak-to-peak potential separation ( $\Delta$ Ep=0.216 V) than other electrodes. Such surface modification helps to store more electrical charge by increasing electrical conductivity during its charge/discharge processing time. In addition, the lower charge transfer resistance property with a value of 788.9  $\Omega$  and the fast heterogeneous electron transfer rate of 2.92 s-1 enable to facilitate glucose oxidation, and this enhances to produce high power output and increase wastewater treatment efficiency. As a result, the bioelectrical activity of α-MnO2/NiO/PANI composite-modified PGE was very effective in producing a maximum power density of 506.96 mW m-2 with COD of 81.92%. The above observations justified that  $\alpha$ -MnO2/NiO/PANI/PGE serves as an effective anode material in double-chambered MFC application.

Abate, S. M., Assen, S., Yinges, M., & Basu, B. (2021). Survival and predictors of mortality among patients admitted to the intensive care units in southern Ethiopia: A multi-center cohort study. *Annals of Medicine and Surgery*, 65. Scopus. https://doi.org/10.1016/j.amsu.2021.102318

#### Abstract

#### Background

The burden of life-threatening conditions requiring intensive care units has grown substantially in low-income countries related to an emerging pandemic, urbanization, and hospital expansion. The rate of ICU mortality varied from region to region in Ethiopia. However, the body of evidence on ICU mortality and its predictors is uncertain. This study was designed to investigate the pattern of disease and predictors of mortality in Southern Ethiopia.

#### Methods

After obtaining ethical clearance from the Institutional Review Board (IRB), a multi-center cohort study was conducted among three teaching referral hospital ICUs in Ethiopia from June 2018 to May 2020. Five hundred and seventeen Adult ICU patients were selected. Data were entered in Statistical Package for Social Sciences version 22 and STATA version 16 for analysis. Descriptive statistics were run to see the overall distribution of the variables. Chi-square test and odds ratio were determined to identify the association between independent and dependent variables. Multivariate analysis was conducted to control possible confounders and identify independent predictors of ICU mortality.

#### Results

The mean ( $\pm$ SD) of the patients admitted in ICU was 34.25( $\pm$ 5.25). The overall ICU mortality rate was 46.8%. The study identified different independent predictors of mortality. Patients with cardiac arrest were approximately 12 times more likely to die as compared to those who didn't, AOR = 11.9(95% CI:6.1 to 23.2).

#### Conclusion

The overall mortality rate in ICU was very high as compared to other studies in Ethiopia as well as globally which entails a rigorous activity from different stakeholders.

Abrham, T., Beshir, H. M., & Haile, A. (2021). Sweetpotato production practices, constraints, and variety evaluation under different storage types. *Food and Energy Security*, 10(1). Scopus. https://doi.org/10.1002/fes3.263

#### Abstract

Sweetpotato plays an important role in ensuring food security and household income sources for local communities in Ethiopia. It is dominantly grown in southern parts of Ethiopia. However, its production and productivity over the last few years has declined due to the limited access of quality planting materials at the onset of the rainy season, disease, and severe pest infestation. Therefore, it was imperative to carry out this study to identify the main constraints related to the recent decline in sweet in Misrak Badawacho District. The survey result revealed that many varieties of sweetpotato were grown in the district; mainly, Awassa-83, Ogan-Sagan, and Wolaita-local were the most preferred variety by producers. The main sweetpotato production and storage constraints in the study district are as follows: rodents, disease and insect pests, heat and drought, shortage of

quality planting materials, and absence of best methods for long-term storage. Ogan-Sagan and Wolaita-local were evaluated under different storage types (straw, soil, ash, sawdust, and sand storage). The combination of Awassa-83 variety and sand storage was performed better in percentage of decay, weight loss, and weevil damage, whereas length and number of vine per storage roots were performed better in the separate treatment. Thus, Awassa-83 variety and sand storage can be recommended for maintaining the storage roots during dry periods and access of quality vines at the onset of the rainy season. More importantly, sand storage provides an opportunity to maintain the quality of sweetpotato storage roots for a long period of time and producers can easily and timely access quality vines at the onset of rainy season.

## Dubale, D. G., Abshiro, T. A., & Hone, F. G. (2021). Synthesis and characterization of copper zinc sulfide (Cuxzn1-xs) ternary thin film by using acidic chemical bath deposition method. *International Journal of Thin Film Science and Technology*, 10(1), 21–27. Scopus. https://doi.org/10.18576/ijtfst/100104

#### Abstract

In this work, copper zinc sulfide (formula presented) ternary thin films with parameter "x" such that  $0 \le x \le 0.13$  were successfully deposited on glass substrate by acidic chemical baths using EDTA as a complexing agent, zinc acetate and copper acetate as a source (formula presented) respectively and thioacetamide as source of (formula presented)'. ZnS was deposited as a pure binary thin film. The band gap of ZnS thin film was increased from 3.8 eV to 4.05 eV for 4.7% Cu added to zinc sulfide. ZnS and Cu#Zn&'#S thin films were characterized by X-Ray Diffraction (XRD), Scanning Electron Microscopy (SEM), Energy Dispersive X-ray (EDX) and Optical Absorption Spectroscopy (UV-Vis). The effects of deposition concentrations of copper on the optical property of the CuZnS thin films were observed. The XRD studies revealed that pure zinc sulfide thin film cubic structure and all the CuZnS samples were crystallized in amorphous structure. The SEM studies determined the films grain size as spherical shape and the atoms in the film were networked to each other. When copper acetate was added to zinc acetate, they formed a solid solution after a long time by acidic chemical bath deposition. The band gap of pure ZnS thin film was 3.8 eV at deposition time of 1:30 hr with a pH of 3.5 and at deposition temperature of 75 75°C. The optical energy band gap of copper zinc sulfide was

conducted at 2.1 eV by the above deposition condition. The films were adherent, transparent and uniform.

Ayano, G., Belete, A., Duko, B., Tsegay, L., & Dachew, B. A. (2021). Systematic review and meta-analysis of the prevalence of depressive symptoms, dysthymia and major depressive disorders among homeless people. *BMJ Open*, *11*(2). Scopus. https://doi.org/10.1136/bmjopen-2020-040061

#### Abstract

#### **Objectives**

To assess the global prevalence estimates of depressive symptoms, dysthymia and major depressive disorders (MDDs) among homeless people. Design Systematic review and metaanalysis.

#### **Data sources**

Databases including PubMed, Scopus and Web of Science were systematically searched up to February 2020 to identify relevant studies that have reported data on the prevalence of depressive symptoms, dysthymia and MDDs among homeless people. Eligibility criteria Original epidemiological studies written in English that addressed the prevalence of depressive problems among homeless people. Data extraction and synthesis A random-effect meta-analysis was performed to pool the prevalence estimated from individual studies. Subgroup and sensitivity analyses were employed to compare the prevalence across the groups as well as to identify the source of heterogeneities. The Joanna Briggs Institute's quality assessment checklist was used to measure the study quality. Cochran's Q and the I 2 test were used to assess heterogeneity between the studies.

#### Results

Forty publications, including 17 215 participants, were included in the final analysis. This metaanalysis demonstrated considerably higher prevalence rates of depressive symptoms 46.72% (95% CI 37.77% to 55.90%), dysthymia 8.25% (95% CI 4.79% to 11.86%), as well as MDDs 26.24% (95% CI 21.02% to 32.22%) among homeless people. Our subgroup analysis showed that the prevalence of depressive symptoms was high among younger homeless people (<25 years of age), whereas the prevalence of MDD was high among older homeless people (>50 years of age) when compared with adults (25-50 years).

#### Conclusion

This review showed that nearly half, one-fourth and one-tenth of homeless people are suffering from depressive symptoms, dysthymia and MDDs, respectively, which are notably higher than the reported prevalence rates in the general population. The findings suggest the need for appropriate mental health prevention and treatment strategies for this population group.

# Rajkumar, S., Arulmurugan, B., Mulugeta, L., Mekonnen, A., Tafesse, D., & Teklemariam, A. (2021). *Taguchi optimization of drilling process parameters on LM13/10 wt%Graphene composites made by stir casting process.* 47, 431–436. Scopus. https://doi.org/10.1016/j.matpr.2021.04.603 Abstract

In this investigational study was extremely focused on optimized the Material Removal Rate (MRR) analysis of LM13/Graphene AMCs with three machining variables. The LM13/10 wt%Graphene AMCs are prepared via the melt stir casting process. The conventional machining (drilling) method was to investigate the machinability features. In this experimental analysis, drilling speed (1000, 1200, 1400 rpm), drilling feed (40, 80, 120 mm/min) and drilling time (2, 4, 6 min) were applied as input process variables for the drilling operation. The input variables were to test responses such as the MRR. Taguchi optimization, contour map, and variance test also stated.

Kirschel, A. N. G., Moysi, M., Lukhele, S. M., Sebastianelli, M., Asfaw, T., Hadjioannou, L., Mortega, K. G., Monadjem, A., & Moyle, R. G. (2021). Taxonomic revision of the Redfronted Tinkerbird Pogoniulus pusillus (Dumont, 1816) based on molecular and phenotypic analyses. *Bulletin of the British Ornithologists' Club*, *141*(4), 428–442. Scopus. https://doi.org/10.25226/bboc.v141i4.2021.a6

#### Abstract

Red-fronted Tinkerbird Pogoniulus pusillus (Dumont, 1816) presently comprises three recognised subspecies, of which two are found in East Africa and one occurs disjunctly in southern Africa. Based on their respective distributions and phenotypic differences, a taxonomic reassessment of the species is warranted. We performed a phylogenetic reconstruction using the mitochondrial genes ATPase 6/8 based on 33 samples from across the distribution of Red-fronted Tinkerbird and four outgroup samples, and then determined correspondence between genetic distances and

differences in song and morphology among clades using the Tobias et al. criteria. Our phylogenetic analyses revealed 4.4% sequence divergence in mtDNA between northern and southern populations, with plumage, morphometric and song differences of a similar magnitude to those between P. pusillus and Yellow-fronted Tinkerbird P. chrysoconus, and above species-level thresholds according to the Tobias et al. criteria. Furthermore, the molecular phylogeny supports recognition of a synonymised taxon (P. p. eupterus) as a distinct, but phenotypically cryptic, subspecies in East Africa, with c.1.5% sequence divergence from P. p. affinis and P. p. uropygialis, which in turn differ less (1%) from each other. We propose that northern and southern Red-fronted Tinkerbirds are treated as separate species, and that the subspecies eupterus is resurrected. Our findings suggest that P. chrysoconus as presently constituted may also merit taxonomic revision.

## Erena, O. T., Kalko, M. M., & Debele, S. A. (2021). Technical efficiency, technological progress and productivity growth of large and medium manufacturing industries in Ethiopia: A data envelopment analysis. *Cogent Economics and Finance*, 9(1). Scopus. https://doi.org/10.1080/23322039.2021.1997160

#### Abstract

The purpose of this study is to assess empirically how the technical efficiency scores for 43 subsectors and their determinants over the period 2010 to 2017 show significant variation across the sub-sectors. The study applied a two-step approach for measuring technical efficiency and its determinants. A data envelopment analysis output-orientation (i.e. both CCR & BCC models) is used to estimate technical efficiency scores for 43 sub-sectors over the period 2010 to 2017. Malmquist productivity index (MPI) output orientation is also applied to compute technical efficiency change, technological progress, and productivity change. The estimated technical efficiency score shows significant variation across the sub-sectors. Thus, we used a Tobit regression model to scrutinize what defines the variation in technical efficiency scores using three years of panel data which covers 2015 to 2017. Moreover, the 43 sub-sectors were further grouped into 14 major sub-sectors and classified as public and private to examine whether there is a technical efficiency score discrepancy between the same sub-sectors operating under different ownership. For measuring overall technical efficiency, we used two output variables (i.e., valueadded and operating surplus) and two input variables (i.e., total fixed assets and a total number of employees). When reducing the sub-sectors to fourteen major groups, the operating surplus was
not included, thus we used value-added and total sales as output variables and total fixed assets, the total number of employees, and cost of raw materials used in the production process as input variables. To shed light on the source of inefficiency, technical efficiency is decomposed into pure technical efficiency and scale efficiency. This study found that the sector had experienced a 37 percent technical efficiency in overall average when the CCR model was used. The study also claims that public owned subsectors are less likely to be efficient than private subsectors. The regression results show the capital expenditure ratio has a significant positive influence on technical efficiency. The Malmquist index result also shows, on average, the sector had registered a 10.5% technological progress and a 13% productivity growth over the period 2010–2017. The findings of the study would have implications for policymakers, government, and firm owners in that it offers an insight into the source of productivity growth in the sector.

### Mamo, K., Siyoum, M., & Birhanu, A. (2021). Teenage pregnancy and associated factors in Ethiopia: A systematic review and meta-analysis. *International Journal of Adolescence and Youth*, 26(1), 501–512. Scopus. https://doi.org/10.1080/02673843.2021.2010577

#### Abstract

This article reports on teenage pregnancy and associated factors in Ethiopia. All studies available to the year 2020 conducted on teenage pregnancy in Ethiopia were included. The purpose of this systematic review and meta-analysis was to synthesize evidence on the prevalence and associated factors with teenage pregnancy in Ethiopia. The preferred reporting items for systematic review and meta-analysis (PRISMA) guidelines to conduct this meta-analysis were followed by the reviewers. The pooled estimated prevalence of teenage pregnancy in Ethiopia was 23.59% (95% CI: 14.75, 32.43). Sexual practice before the age of 15 years (OR = 1.75(95%CI 1.06, 2.44), no history of contraceptive use OR =3.53 (95%CI 1.94, 5.12) and Marital status OR=2.35 (95%CI1.36, 3.34) were factors associated with teenage pregnancy. Sex education in schools and enhanced contraceptive utilization among adolescents are recommended. Future quantitative as well as qualitative researches should focus on personal as well as social determinants to teenage pregnancy.

Allen Jeffrey, J., Ravikumar, M. M., Ashraff Ali, K. S., Vishnu Kumar, R., Rajkumar, S., & Pugazhendhi, L. (2021). *Tensile and flexural properties of natural fibre matrix composites developed through hand-lay method.* 47, 400–404. Scopus. https://doi.org/10.1016/j.matpr.2021.04.594

#### Abstract

In the current days, composite serve as a essential role in the aircraft, structural automotive, marine and electronics and so on. Composite are being employed in the aircraft to obtain much efficiency. The main benefits of our experimental work is to augment the impact resistance, hardness and strength-weight ratio of the material which is going to be produced through the combination of Palm (H) and E-glass (EG) fibers using pairing method. The fabrication of the polymer matrix composite is done by conventional hand-lay (CHL) approach. Epoxy resin alongside with HY951 hardener is used as the binding element throughout the layer. This experimental work deals with producing, mechanical characterization of a hybrid (GFRP+Palm(H)+Palm(V)+Palm(H)+GFRP) composite and also the comparison of it with the (GFRP+Palm(V)+Palm(H)+Palm(V)+GFRP) based composite. Experimental outcome reveals the hybrid synthetic composite has outstanding properties under impact and tensile loading.

Bedaso, A., Adams, J., Peng, W., & Sibbritt, D. (2021c). The association between social support and antenatal depressive and anxiety symptoms among Australian women. *BMC Pregnancy and Childbirth*, 21(1). Scopus. https://doi.org/10.1186/s12884-021-04188-4

#### Abstract

#### Background

Antenatal depression and antenatal anxiety adversely affect several obstetric and foetal outcomes, and increase the rate of postnatal mental illness. Thus, to tackle these challenges the need for social support during pregnancy is vital. However, an extensive literature search failed to show a published study on the relationship between domains of social support and antenatal depressive, as well as antenatal anxiety symptoms in Australia. This study examined the association between domains of social support and antenatal depressive and anxiety symptoms among Australian women.

#### Methods

The current study used data obtained from the 1973–78 cohort of the Australian Longitudinal Study on Women's Health (ALSWH), focusing upon women who reported being pregnant (n = 493). Depression and anxiety were assessed using the 10 item Center for Epidemiological Studies Depression (CES-D-10) scale, and the 9-item Goldberg Anxiety and Depression scale (GADS) respectively. The 19 item-Medical Outcomes Study Social Support index (MOSS) was used to assess social support. A logistic regression model was used to examine the associations between domains of social support and antenatal depressive and anxiety symptoms after adjusting for potential confounders.

#### Result

The current study found 24.7 and 20.9% of pregnant women screened positive for depressive and anxiety symptoms respectively. After adjusting for potential confounders, our study found that the odds of antenatal depressive symptoms was about four and threefold higher among pregnant women who reported low emotional/informational support (AOR = 4.75; 95% CI: 1.45, 15.66; p = 0.010) and low social support (overall support) (AOR = 3.26; 95% CI: 1.05, 10.10, p = 0.040) respectively compared with their counterpart. In addition, the odds of antenatal anxiety symptoms was seven times higher among pregnant women who reported low affectionate support/positive social interaction (AOR = 7.43; 95% CI: 1.75, 31.55; p = 0.006).

#### Conclusion

A considerable proportion of pregnant Australian women had depressive symptoms and/or anxiety symptoms, which poses serious health concerns. Low emotional/informational support and low affectionate support/positive social interaction have a significant association with antenatal depressive and anxiety symptoms respectively. As such, targeted screening of expectant women for social support is essential.

Tessema, G. A., Kinfu, Y., Dachew, B. A., Tesema, A. G., Assefa, Y., Alene, K. A., Aregay, A. F., Ayalew, M. B., Bezabhe, W. M., Bali, A. G., Dadi, A. F., Duko, B., Erku, D., Gebrekidan, K., Gebremariam, K. T., Gebremichael, L. G., Gebreyohannes, E. A., Gelaw, Y. A., Gesesew, H. A., ... Tesfay, F. H. (2021). The COVID-19 pandemic and healthcare systems in Africa: A scoping review of preparedness, impact and response. *BMJ Global Health*, 6(12). Scopus. https://doi.org/10.1136/bmjgh-2021-007179

#### Abstract

#### Background

The COVID-19 pandemic has overwhelmed health systems in both developed and developing nations alike. Africa has one of the weakest health systems globally, but there is limited evidence on how the region is prepared for, impacted by and responded to the pandemic.

#### Methods

We conducted a scoping review of PubMed, Scopus, CINAHL to search peer-reviewed articles and Google, Google Scholar and preprint sites for grey literature. The scoping review captured studies on either preparedness or impacts or responses associated with COVID-19 or covering one or more of the three topics and guided by Arksey and O'Malley's methodological framework. The extracted information was documented following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension checklist for scoping reviews. Finally, the resulting data were thematically analysed.

#### **Results**

Twenty-two eligible studies, of which 6 reported on health system preparedness, 19 described the impacts of COVID-19 on access to general and essential health services and 7 focused on responses taken by the healthcare systems were included. The main setbacks in health system preparation included lack of available health services needed for the pandemic, inadequate resources and equipment, and limited testing ability and surge capacity for COVID-19. Reduced flow of patients and missing scheduled appointments were among the most common impacts of the COVID-19 pandemic. Health system responses identified in this review included the availability of telephone consultations, re-purposing of available services and establishment of isolation centres, and provisions of COVID-19 guidelines in some settings.

#### Conclusions

The health systems in Africa were inadequately prepared for the pandemic, and its impact was substantial. Responses were slow and did not match the magnitude of the problem. Interventions that will improve and strengthen health system resilience and financing through local, national and global engagement should be prioritised.

### Birhanu, Z. K., Mengesha, T., & Salgado, A. J. (2021). The Darcy problem with porosity depending exponentially on the pressure. *Journal of Computational and Applied Mathematics*, *398*. Scopus. https://doi.org/10.1016/j.cam.2021.113642

#### Abstract

We consider the flow of a viscous incompressible fluid through a porous medium. We allow the permeability of the medium to depend exponentially on the pressure and provide an analysis for this model. We study a splitting formulation where a convection diffusion problem is used to define the permeability, which is then used in a linear Darcy equation. We also study a discretization of this problem, and provide an error analysis for it.

Yeshaneh, A., Kassa, A., Kassa, Z. Y., Adane, D., Fikadu, Y., Wassie, S. T., Alemu, B. W., Tadese, M., Shitu, S., & Abebe, H. (2021). The determinants of 5th minute low Apgar score among newborns who delivered at public hospitals in Hawassa City, South Ethiopia. *BMC Pediatrics*, 21(1). Scopus. https://doi.org/10.1186/s12887-021-02745-6

#### Abstract

#### Background

Newborn morbidity and mortality are forecasted using the Apgar scores. Obstetricians worldwide have used the Apgar score for more than half a century for the assessment of immediate newborn conditions. It is a simple and convenient evaluation system that offers a standardized and effective assessment of newborn infants. Neonatal morbidity and mortality can be reduced if high-risk neonates are identified and managed adequately. This study aimed to assess the determinants of 5th minute low Apgar score among newborns at Public hospitals in Hawassa city, South Ethiopia.

#### Methods

A hospital-based unmatched case-control study was conducted at Public Hospitals in Hawassa city. Data were collected from 134 cases and 267 controls using a structured and pre-tested

questionnaire by observing, interviewing, and reviewing patient cards. Newborns who delivered with a 5th minute Apgar score < 7 were considered as cases; whereas a similar group of newborns with a 5th minute Apgar score of  $\geq$  7 were categorized as controls. A consecutive sampling technique was employed to recruit cases, while a simple random sampling technique was used to select controls. Data entry and analysis were performed using Epi Data version 3.1 and SPSS version 20 respectively. Binary and multivariable analyses with a 95 % confidence level were performed. In the final model, variables with P < 0.05 were considered statistically significant.

#### Results

After controlling for possible confounding factors, the results showed that lack of physical and emotional support during labor and delivery [AOR = 3.5, 95 %CI:1.82-6.76], rural residence [AOR = 4, 95 %CI:2.21-7.34], lack of antenatal care follow up [AOR = 3.5, 95 % CI:1.91-6.33], anemia during pregnancy [AOR = 2.3,95 %CI:1.10-4.71] and low birth weight [AOR = 6.2, 95 %CI:2.78-14.03] were determinant factors of low Apgar scores. The area under the Apgar score ROC curve was 87.4 %.

#### Conclusions

Lack of physical and emotional support, rural residence, lack of ANC follow-up, low birth weight, and anemia during pregnancy were determinant factors of a low Apgar score. `Effective health education during preconception about anemia during pregnancy and ANC will help in detecting high-risk pregnancies that lead to a low Apgar score. In addition to the standard care of using electronic fetal monitoring, increasing access to compassion ships during labor and delivery is recommended.

### Kim, T., Riaz, M. N., Awika, J., & Teferra, T. F. (2021). The effect of cooling and rehydration methods in high moisture meat analogs with pulse proteins-peas, lentils, and faba beans. *Journal of Food Science*, *86*(4), 1322–1334. Scopus. https://doi.org/10.1111/1750-3841.15660

#### Abstract

Pulse proteins (PLP) can be ideal alternative-sources that produce a meat-like textured product, known as a high moisture meat analog (HMMA). In this research, each commercial PLP: pea (16%), lentil (16%), and faba-bean (20%) was mixed with pea isolate (63%, 63%, and 59%, respectively) and constant ingredients which are canola oil (6%) and wheat gluten (15%) and texturized to produce HMMA using a twin-screw extruder (TX-52) with a cooling die. Soy

concentrate and soy isolate were mixed with the constant ingredients and texturized into an HMMA and used as a control. Before freezing for storage, each sample was cooled by air, water, or a brine solution (2% or 4%) for 10 min. Frozen samples were thawed at room temperature (25 °C) for 3 hr and rehydrated by soaking at 25 °C for 2 hr, warm-soaking at 50 °C for 12 hr, or boiling for 2 min. Color, moisture content (MC), specific density (SD), water absorption index (WAI), water solubility index (WSI), and texture were measured. Compared to the control, samples with PLP had less lightness and texture and greater redness, yellowness, MC and WSI. The 2% brine solution used for cooling reduced WSI without textural change compared to other cooling methods. Boiling for rehydration increased lightness while warm-soaking decreased lightness and increased yellowness. In addition, boiling resulted in the least MC, SD, WSI, and WAI following soaking and warm-soaking. Therefore, these PLP can be used as alternative meat sources to soy proteins and a 2% brine solution for cooling and rehydration by boiling are recommended to reduce the WSI. Practical Application: Pulses are an excellent food ingredient because they are rich in protein and have an exceptional nutritional profile. In this study, high moisture meat analogs containing pea proteins, lentil proteins, faba bean proteins, and pea isolate instead of soy concentrate and soy isolate were produced. According to the results, pulse proteins can be an alternative source to soy proteins. Since they formed relatively well-defined orientation. Further research can be conducted using modified processing conditions for texturization to improve its quality. In addition, this research can help researchers and product developers understand proper handling methods for HMMA products after production such as cooling before freezing for storage and thawing and rehydrating after freezing.

Desalegn, T. A., Gebremedhin, S., Alemayehu, F. R., & Stoecker, B. J. (2021). The effect of school feeding programme on class absenteeism and academic performance of schoolchildren in Southern Ethiopia: A prospective cohort study. *Public Health Nutrition*, 24(10), 3066–3074. Scopus. https://doi.org/10.1017/S1368980021000501

Abstract

#### Objective

Ethiopia recently scaled up the implementation of a school feeding programme (SFP). Yet, evidence on the impact of such programmes on academic outcomes remains inconclusive. We

evaluated the effect of the SFP on class absenteeism and academic performance of primary school students (grade 5-8) in Sidama zone, Southern Ethiopia.

#### Design

This prospective cohort study enrolled SFP-beneficiary (n 240) and non-beneficiary (n 240) children 10-14 years of age from sixteen public schools and followed them for an academic year. School absenteeism was measured as the number of days children were absent from school in the year. Academic performance was defined based on the average academic score of the students for ten subjects they attended in the year. Data were analysed using multivariable mixed effects negative binomial and linear regression models.

#### Setting

Food insecure districts in Sidama zone, Southern Ethiopia. Participants: SFP-beneficiary and nonbeneficiary children 10-14 years of age. Results: The mean (sd) number of days children were absent from school was  $4 \cdot 0$  (sd  $1 \cdot 5$ ) and  $9 \cdot 3$  (sd  $6 \cdot 0$ ), among SFP beneficiaries and nonbeneficiaries, respectively. Students not covered by the SFP were two times more likely to miss classes (adjusted rate ratio =  $2 \cdot 30$ ; 95 % CI  $2 \cdot 03$ ,  $2 \cdot 61$ ). Pertaining to academic performance, a significant but small  $2 \cdot 40$  (95 % CI  $0 \cdot 69$ ,  $4 \cdot 12$ ) percentage point mean difference was observed in favour of SFP beneficiaries. Likewise, the risk of school dropout was six times higher among nonbeneficiaries (adjusted rate ratio =  $6 \cdot 04$ ; 95 % CI  $1 \cdot 61$ ,  $22 \cdot 68$ ).

#### Conclusion

SFP promotes multiple academic outcomes among socio-economically disadvantaged children.

Abera, M., Tolera, A., Nurfeta, A., & Geleti, D. (2021b). The Effect of Supplementation of Vetch (Vicia villosa) on Performance of Arsi-Bale Sheep Fed Basal diet of Desho (Pennisetum pedicellatum) grass. *Acta Agriculturae Scandinavica A: Animal Sciences*, *70*(3–4), 123–131. Scopus. https://doi.org/10.1080/09064702.2021.1976264

#### Abstract

This study was conducted to investigate the effects of Vicia villosa supplementation to the basal diet of desho grass hay on feed intake, growth performance, and carcass characteristics of the Arsi-Bale sheep. Twenty-four lambs were assigned by stratified randomization based on their initial body weight into six blocks consisting of four lambs per block to four dietary treatments. Desho

grass hay was fed free choice to all experimental lambs whereas 0, 150, 300 and 450 g of Vicia villosa was supplemented to animals. The results showed that the daily DM intake and daily body weight gain of experimental sheep showed significant improvement (P < 0.05) with increased level of inclusion of Vicia villosa into the basal ration. It can be concluded that the supplementation of 450 g of Vicia villosa hay to desho grass hay had a positive effect on growth performance and carcass characteristics of Arsi-Bale sheep.

## Lengyel, C. G., Hussain, S., Trapani, D., El Bairi, K., Altuna, S. C., Seeber, A., Odhiambo, A., Habeeb, B. S., & Seid, F. (2021). The emerging role of liquid biopsy in gastric cancer. *Journal of Clinical Medicine*, *10*(10). Scopus. https://doi.org/10.3390/jcm10102108

#### Abstract

#### Background

Liquid biopsy (LB) is a novel diagnostic method with the potential of revolutionizing the prevention, diagnosis, and treatment of several solid tumors. The present paper aims to summarize the current knowledge and explore future possibilities of LB in the management of metastatic gastric cancer.

#### Methods

This narrative review examined the most recent literature on the use of LB-based techniques in metastatic gastric cancer and the current LB-related clinical trial landscape. (3)

#### Results

In gastric cancer, the detection of circulating cancer cells (CTCs) has been recognized to have a prognostic role in all the disease stages. In the setting of localized disease, cell-free DNA (cfDNA) and circulating tumor DNA (ctDNA) qualitative and quantitative detection have the potential to inform on the risk of cancer recurrence and metastatic dissemination. In addition, gastric cancer-released exosomes may play an essential part in metastasis formation. In the metastatic setting, the levels of cfDNA show a positive correlation with tumor burden. There is evidence that circulating tumor microemboli (CTM) in the blood of metastatic patients is an independent prognostic factor for shorter overall survival. Gastric cancer-derived exosomal microRNAs or clonal mutations and

copy number variations detectable in ctDNA may contribute resistance to chemotherapy or targeted therapies, respectively. There is conflicting and limited data on CTC-based PD-L1 verification and cfDNA-based Epstein–Barr virus detection to predict or monitor immunotherapy responses.

#### Conclusions

Although preliminary studies analyzing LBs in patients with advanced gastric cancer appear promising, more research is required to obtain better insights into the molecular mechanisms underlying resistance to systemic therapies. Moreover, validation and standardization of LB methods are crucial before introducing them in clinical practice. The feasibility of repeatable, minimally invasive sampling opens up the possibility of selecting or dynamically changing therapies based on prognostic risk or predictive biomarkers, such as resistance markers. Research is warranted to exploit a possible transforming area of cancer care.

### Menuta, F. (2021). *The ensete in Gurage: Nomenclature, use and meaning extension* (Vol. 48, p. 61). Scopus. https://doi.org/10.1075/impact.48.02men

#### Abstract

The aim of this article is to investigate the way Gurage people name the diverse ensete (Ensete ventricosum) varieties and how that naming categorises varieties of the plant. It also attempts to describe lexical entities associated with ensete and its products, meaning extensions of ensete names and the associated vocabularies in everyday language use, such as in proverbs and insults. The study follows cross-sectional research design and qualitative methodology. Key consultant interviews and interview guides were used as a method and tool, respectively. Eight key consultants from Gumer, Chaha, Inor, Ezha, and Gyeta participated in the study. The findings show that there are about 71 ensete varieties in Gurage. The people classify ensete varieties according to color, size, value, propensity, source of the plant, height, and other variables. The lexical nets related to the plant, its products and byproducts are significantly large and qualify documenting them as part of lexicography. Some ensete variety names are metaphorically used to insult someone, as in gjinbwə 'obese' and in proverbs, as in gjinbwə ihata birəzin t'onata jimwəsin [Gynbuwe its.water heavy.on.it its.power it. seems.to it] 'When the ensete variety Gynbuwe carries much water in its stem, it considers itself as an entity that has much

power'. The study can help linguists, anthropologists, and ethno-botanists in studying the interaction between man, language and nature, in this case the ensete plant.

#### Gebre, G. G., Mawia, H., Makumbi, D., & Rahut, D. B. (2021). The impact of adopting stresstolerant maize on maize yield, maize income, and food security in Tanzania. *Food and Energy Security*, 10(4). Scopus. https://doi.org/10.1002/fes3.313

#### Abstract

Productivity growth emanating from scientific advances offered by biotechnology and other plant breeding initiatives offers great promise for meeting the growing food demand worldwide. This justifies investments in agricultural research and development that have led to the development of stress-tolerant maize varieties (STMVs) in Africa. While most literature has documented the average impacts of STMVs on productivity, this paper is premised on the fact that benefits from technology adoption are not the same across household. The paper addresses this information gap by examining potential heterogeneity in yield, income, and food security benefits from of adopting STMVs using a sample of 720 maize-producing households from Tanzania. The dose-response continuous treatment effect method supported by an endogenous switching probit model was used to estimate the heterogenous impact of STMV adoption on the three outcomes of interest. Results show that, overall, the adoption of stress-tolerant maize varieties increased maize grain yield by about 1 ton/ha, maize income by about \$62/ha. The adoption of STMVs also reduced the propensity to report mild, moderate, and severe food insecurity by 34%, 17%, and 6%, respectively. There are substantial idiosyncratic variations in the productivity, income, and food security effects depending on the scale of adoption, with a higher impact at lower dose levels of adoption. The heterogenous and pro-poor nature of STMV adoption is also revealed through nonparametric results showing higher productivity benefits among households that are less endowed with wealth and knowledge. These findings underscore the need for further scaling of stress-tolerant maize varieties for greater impact on the livelihoods of poor small-scale farmers in Tanzania.

Bulti, A. T. (2021). The Influence of Dam Construction on the Catchment Hydrologic Behavior and its Effects on a Discharge Forecast in Hydrological Models. *Water Resources Management*, 35(6), 2023–2037. Scopus. https://doi.org/10.1007/s11269-021-02829-z

#### Abstract

The hydrological properties of a river basin are extremely affected by the construction of a dam. The discharges and sediment flow distribution, in a modified river basin will not be the same as to a natural catchment. Hydrological models contextually focus on a natural river basin without any modification. Unfortunately, most of the river basins have been under such modification, which is not favorable for a model simulation at a normal condition. This research was done at the Awash River Basin, already modified because of dam construction. A systematic approach was applied to handle the modification in the basin, through an application of the Soil and Water Assessment Tool (SWAT) and Hydrologic Engineering center's River Analysis System (HEC-RAS) consecutively. SWAT model was implemented to simulate the upstream part of the basin. At the downstream parts of the basin, a simulation process was difficult on a SWAT model, due to the modified hydrologic parameters. Hence, the HEC-RAS model was applied because of its applicability under such circumstances. The model outputs indicate that the SWAT model can simulate the upstream part of the basin, in a good performance range that can be used for practical implementation. The downstream i.e., the modified catchment was simulated relatively better in the HEC-RAS model with good accuracy. Also, this research pointed out that a combined hydrologic and hydraulic model system development can be the best solution for modified catchments.

Ferreira, M. S., Jones, M. R., Callahan, C. M., Farelo, L., Tolesa, Z., Suchentrunk, F., Boursot, P., Mills, L. S., Alves, P. C., Good, J. M., & Melo-Ferreira, J. (2021). The Legacy of Recurrent Introgression during the Radiation of Hares. *Systematic Biology*, *70*(3), 593–607. Scopus. https://doi.org/10.1093/sysbio/syaa088

#### Abstract

Hybridization may often be an important source of adaptive variation, but the extent and long-term impacts of introgression have seldom been evaluated in the phylogenetic context of a radiation. Hares (Lepus) represent a widespread mammalian radiation of 32 extant species characterized by

striking ecological adaptations and recurrent admixture. To understand the relevance of introgressive hybridization during the diversification of Lepus, we analyzed whole exome sequences (61.7 Mb) from 15 species of hares (1-4 individuals per species), spanning the global distribution of the genus, and two outgroups. We used a coalescent framework to infer species relationships and divergence times, despite extensive genealogical discordance. We found high levels of allele sharing among species and show that this reflects extensive incomplete lineage sorting and temporally layered hybridization. Our results revealed recurrent introgression at all stages along the Lepus radiation, including recent gene flow between extant species since the last glacial maximum but also pervasive ancient introgression occurring since near the origin of the hare lineages. We show that ancient hybridization between northern hemisphere species has resulted in shared variation of potential adaptive relevance to highly seasonal environments, including genes involved in circadian rhythm regulation, pigmentation, and thermoregulation. Our results illustrate how the genetic legacy of ancestral hybridization may persist across a radiation, leaving a long-lasting signature of shared genetic variation that may contribute to adaptation. [Adaptation; ancient introgression; hybridization; Lepus; phylogenomics.]

Lukas, K., Markos, E., Belayneh, F., & Habte, A. (2021). The magnitude of hypertension and associated factors among clients on highly active antiretroviral treatment in Southern Ethiopia, 2020: A hospital-based cross-sectional study. *PLoS ONE*, *16*(10 October). Scopus. https://doi.org/10.1371/journal.pone.0258576

#### Abstract

#### Introduction

Following the introduction of Highly Active Anti Retro Viral Treatment (HAART), the survival of people living with HIV/AIDS (PLHIV) has improved. However, hypertension remains a major challenge for people living with HIV. Very little effort has been made to examine the magnitude of hypertension and its contributing factors among clients receiving HAART, particularly in southern Ethiopia. Hence, the current study aimed at determining the frequency of Hypertension and associated factors among clients receiving HAART at Wachemo University Nigist Eleni Mohammed Memorial Referral Hospital, southern Ethiopia, 2020.

#### Methods

A hospital-based cross-sectional study took place from January 20- March 20, 2020. A systematic sampling technique was employed in the selection of 397 clients. Interviewer administered pretested structured questionnaire was used for data collection. Blood pressure and anthropometric parameters of PLHIV were measured. The data was encoded and entered using Epi Data Version 3.1 and exported to SPSS version 23 for analysis. Then bivariable and multivariable logistic regression analyses were used to identify associated factors. Adjusted Odds Ratio (AOR) with 95% CI was used to present the estimated effect size and declare the presence of statistically significant association respectively.

#### Results

The magnitude of hypertension among clients on HAART was 11.0% 95% CI [7.93, 14.04]. Being on HAART for at least 60 months (AOR: 2.57, 95% CI: 1.24-5.21), being on TDF/3TC/EFV combination (AOR: 4.61, 95% CI: 2.52-8.3), and high alcohol consumption (AOR: 4.31, 95% CI: 1.84-10.02) were identified as significant predictors of hypertension among clients on HAART. Conclusion and recommendation The magnitude of hypertension in the study area was in a considerable state to plan and implement intervention measures. For those clients who have received TDF/3TC/EFV and TDF/3TC/NVP and those who have been on HAART for 60 months, a strong emphasis should be placed on planning a strict follow-up. A concerted effort among health care providers is needed through counseling and education to discourage the habit of high alcohol consumption among clients.

Boshe, B. D., Yimar, G. N., Dadhi, A. E., & Bededa, W. K. (2021). The magnitude of nonadherence and contributing factors among adult outpatient with Diabetes Mellitus in Dilla University Referral Hospital, Gedio, Ethiopia. *PLoS ONE*, *16*(3 March). Scopus. https://doi.org/10.1371/journal.pone.0247952

#### Abstract

#### Introduction

The global prevalence of Diabetes Mellitus (DM) has increased alarmingly over the last two decades. On top of this, the issues of non-adherence to the prescribed medicines further fuel the DM- related complications to become one of the top causes of mortality and morbidity. Despite the considerable efforts in addressing the poor adherence issues, there are still plenty of problems

ahead of us yet to be addressed. The objective of this study was to determine the extent of nonadherence and its contributing factors among diabetic patients attending the medical Referral clinic of Dilla University Referral Hospital.

#### Methods

The institutional-based descriptive cross-sectional study was carried out among patients with diabetes mellitus attending the medical referral clinic of Dilla University Referral Hospital. A systematic random sampling method was used to recruit study participants, and tool was adopted to assess for adherence. A pretested semi-structured questionnaire was used to collect information on factors influencing non-adherence to the diabetic medications, and in-depth interview questionnaire was used for key informant interviews for the qualitative part. Data analysis was carried out using SPSS-20.

#### Results

The overall prevalence of non-adherence to diabetic treatment regimen among the study participants was 34.0%. The study revealed that cost of transport to the hospital and taking alcohol were significantly associated with non-adherence to the diabetic treatment regimen with the (AOR = 6.252(13.56, 28.822); p < 0.000) and (AOR = 13.12(8.06, 44.73); p<0.002) respectively.

#### Conclusions

The study revealed that significant numbers of participants were non-adherent to the Diabetes Mellitus treatment regimens. Intensive counseling, and health education on the importance of good adherence and negative consequences of poor adherence need to be discussed with the patients before starting the medications, and amidst follow up.

Bedaso, A., Adams, J., Peng, W., & Sibbritt, D. (2021d). The mediational role of social support in the relationship between stress and antenatal anxiety and depressive symptoms among Australian women: A mediational analysis. *Reproductive Health*, 18(1). Scopus. https://doi.org/10.1186/s12978-021-01305-6

#### Abstract

#### Background

Pregnancy can be a stressful period for most women and their family members, and the mental wellbeing of pregnant women can face serious challenges. Social support can play a role in improving the psychological well-being of pregnant women by enhancing the stress coping ability

and alleviating stressful conditions. The current study aimed to assess the mediating effects of social support in the relationship between perceived stress and depressive symptoms as well as anxiety symptoms during pregnancy among Australian women.

#### Methods

Of the 8,010 women who completed Survey 6 of the 1973–78 Australian Longitudinal Study on Women's Health (ALSWH) cohort in 2012, those who reported being pregnant (n = 493) were included in the current analyses. Antenatal depressive and anxiety symptoms were assessed using the 10 item Center for Epidemiological Studies Depression (CES-D-10) scale, and the 9-item Goldberg Anxiety and Depression scale (GADS) respectively. The 19 item-Medical Outcomes Study Social Support index (MOSS) was used to examine social support. A parallel mediation model was used to explore the mediational role of each domain of social support between perceived stress and antenatal depressive and anxiety symptoms.

#### Result

The study found that emotional/informational support has a partial mediating effect on the relationship between perceived stress and antenatal depressive symptoms ( $\beta = 0.371$ , 95% CI: 0.067, 0.799) and on the relationship between perceived stress and antenatal anxiety symptoms ( $\beta = 0.217$ , 95% CI: 0.029, 0.462). Affectionate support/positive social interaction and tangible support was found to play no significant mediation role between stress and antenatal depressive and anxiety symptoms.

#### Conclusions

Emotional/informational support appears to play a mediating role in the relationship between stress and antenatal depressive as well as between stress and antenatal anxiety symptoms. In order to further protect pregnant women from the effects of stress, policy makers and maternal health professionals are advised to develop community-based social support programs to enhance prenatal psychosocial support and ensure pregnant women have adequate emotional/information support. Dejene, M., & Cochrane, L. (2021). The Power of Policy and the Entrenchment of Inequalities in Ethiopia: Reframing Agency in the Global Land Rush (p. 234). Scopus. https://doi.org/10.1007/978-3-030-60789-0\_9

#### Abstract

Ethiopia has drawn global attention as one of the epicentres of the global rush for agricultural land. The government is actively seeking out foreign investors and offering attractive incentive packages. These land deals, however, have not been well-received by local populations due to resultant controversies and negative impacts. Concerns surrounding forced resettlement sparked outrage. The government's stated objectives, namely technology transfer, increased production, employment, along with its unstated objectives (i.e. increasing foreign currency reserves), are not being met. After years of 'chasing' investors in the agricultural sector, the land lease policy changed in 2013 and introduced new limits for leases. As a result, several contracts were annulled and foreign investments withered. Available literature on the land rush in Ethiopia and investment deals address a wide range of environmental, political, economic, employment, and food security issues. To-date, there has not been a macro-level geographic assessment of foreign land leases in Ethiopia. This is important because land leases occur in specific places and impact certain people. In this chapter, we highlight the agency of the Government of Ethiopia in a discourse that traditionally focuses on foreign investors and investigate the disproportionate burden placed upon marginalized ethnic minorities as a result of large-scale land acquisitions.

## Duko, B., Mekuriaw, B., Molla, A., & Ayano, G. (2021). The prevalence of premenstrual dysphoric disorder among adolescents in Ethiopia: A systematic review and meta-analysis. *Irish Journal of Medical Science*, *190*(1), 419–427. Scopus. https://doi.org/10.1007/s11845-020-02275-7

#### Abstract

The rates of prevalence of premenstrual dysphoric disorder (PMDD) in Ethiopia were high and inconsistent across studies. However, there was no previous systematic reviews and meta-analysis conducted on this topic. Therefore, this review aimed to systematically review previous studies on the topic and summarize the prevalence of PMDD among students in Ethiopia and formulate recommendations for future clinical services. The preferred reporting items for systematic review

and meta-analysis (PRISMA) guidelines were used to conduct this systematic review and metaanalysis. Popular databases such as PubMed, EMBASE, Psych-INFO, SCOPUS, Google Scholar, African Index Medicus, and African Journals Online (AJOL) were searched for relevant studies. We used a Comprehensive Meta-Analysis software version 3.0 (CMA-3.0) to conduct a metaanalysis. The random-effects model was used to estimate the pooled prevalence. The magnitude of statistical heterogeneity between the eligible articles was checked by Cochrane Q and the I2 statistics. The funnel plot and Egger's regression tests were used to assess potential publication bias. A total of 12 studies that were published between 2003 and 2019 was included in our systematic review and meta-analysis. The pooled estimated prevalence of premenstrual dysphoric disorder among female students in Ethiopia was 54.5% (95% CI 40.8–67.6). The pooled estimated prevalence of premenstrual dysphoric disorder was approximately similar for both studies that recruited study participants from either high school or higher education. Further, the pooled estimated prevalence of premenstrual dysphoric disorder was ranging from 51.2 to 57.2% in leaveone-out sensitivity analysis, suggesting that the removal of one study did not affect the overall prevalence estimate. The pooled estimated prevalence of premenstrual dysphoric disorder among female students in Ethiopia was high. Early screening and appropriate interventions at primary healthcare settings are warranted.

Bedaso, A., Adams, J., Peng, W., & Sibbritt, D. (2021e). The relationship between social support and mental health problems during pregnancy: A systematic review and meta-analysis. *Reproductive Health*, 18(1). Scopus. https://doi.org/10.1186/s12978-021-01209-5

#### Abstract

#### Background

Pregnancy is a time of profound physical and emotional change as well as an increased risk of mental illness. While strengthening social support is a common recommendation to reduce such mental health risk, no systematic review or meta-analysis has yet examined the relationship between social support and mental problems during pregnancy.

#### Methods

The PRISMA checklist was used as a guide to systematically review relevant peer-reviewed literature reporting primary data analyses. PubMed, Psych Info, MIDIRS, SCOPUS, and CINAHL database searches were conducted to retrieve research articles published between the years 2000

to 2019. The Newcastle–Ottawa Scale tool was used for quality appraisal and the meta-analysis was conducted using STATA. The Q and the I2 statistics were used to evaluate heterogeneity. A random-effects model was used to pool estimates. Publication bias was assessed using a funnel plot and Egger's regression test and adjusted using trim and Fill analysis.

#### Result

From the identified 3760 articles, 67 articles with 64,449 pregnant women were part of the current systematic review and meta-analysis. From the total 67 articles, 22 and 45 articles included in the narrative analysis and meta-analysis, respectively. From the total articles included in the narrative analysis, 20 articles reported a significant relationship between low social support and the risk of developing mental health problems (i.e. depression, anxiety, and self-harm) during pregnancy. After adjusting for publication bias, based on the results of the random-effect model, the pooled odds ratio (POR) of low social support was AOR: 1.18 (95% CI: 1.01, 1.41) for studies examining the relationship between low social support and antenatal depression and AOR: 1.97 (95% CI: 1.34, 2.92) for studies examining the relationship between low social support and antenatal anxiety.

#### Conclusion

Low social support shows significant associations with the risk of depression, anxiety, and selfharm during pregnancy. Policy-makers and those working on maternity care should consider the development of targeted social support programs with a view to helping reduce mental health problems amongst pregnant women.

Kuraz, B., Tolera, A., & Abebe, A. (2021). The Role of Bole (Lake Soil) as a Mineral Supplement to Arsi-Bale Sheep Fed Natural Grass Hay and Concentrate Supplement. *Agricultural Science Digest*, *41*(4), 638–643. Scopus. https://doi.org/10.18805/ag.D-310

#### Abstract

#### Background

Mineral deficiencies are considered to be one of the nutritional constraints to sheep performance. An experiment was conducted to evaluate the role of bole soil on feed intake, live weight change and carcass characteristics of Arsi-Bale sheep fed natural grass hay and concentrate supplement and its cost-benefit analysis of bole soil supplementation.

#### Result

Total DM, OM, CP, NDF, ADF intake and ADL were higher (p<0.0001) for T3 than for T1, T2 and T4. Final weight, body weight change, average daily gain and feed conversion efficiency were greater (p<0.0001) for T3 and T2 than for T1 and T4. There were no differences (p>0.05) between T3 and T2 whereas T4 was greater than T1 in these variables. Slaughter weight (SW) was heavier (p<0.0001) for treatment two and treatment three than for treatment four and treatment one, hot carcass weight, foreleg weight and dressing percentage on empty body weight basis were greater (p<0.0001) for T3 and T2 than for T1 and T4.

#### Conclusion

Bole soil supplementation had potentially highest effect on feed intake, live weight change and carcass characteristics of Arsi-Bale sheep than non-supplemented groups. The present study also revealed that supplementation of minerals improved the total weight gain of sheep over the control treatment.

Qamar, A. Y., Hussain, T., Rafique, M. K., Bang, S., Tanga, B. M., Seong, G., Fang, X., Saadeldin, I. M., & Cho, J. (2021). The role of stem cells and their derived extracellular vesicles in restoring female and male fertility. *Cells*, *10*(9). Scopus. https://doi.org/10.3390/cells10092460

#### Abstract

Infertility is a globally recognized issue caused by different reproductive disorders. To date, various therapeutic approaches to restore fertility have been attempted including etiology-specific medication, hormonal therapies, surgical excisions, and assisted reproductive technologies. Although these approaches produce results, however, fertility restoration is not achieved in all cases. Advances in using stem cell (SC) therapy hold a great promise for treating infertile patients due to their abilities to self-renew, differentiate, and produce different paracrine factors to regenerate the damaged or injured cells and replenish the affected germ cells. Furthermore, SCs secrete extracellular vesicles (EVs) containing biologically active molecules including nucleic acids, lipids, and proteins. EVs are involved in various physiological and pathological processes and show promising non-cellular therapeutic uses to combat infertility. Several studies have indicated that SCs and/or their derived EVs transplantation plays a crucial role in the regeneration

of different segments of the reproductive system, oocyte production, and initiation of sperm production. However, available evidence triggers the need to testify the efficacy of SC transplantation or EVs injection in resolving the infertility issues of the human population. In this review, we highlight the recent literature covering the issues of infertility in females and males, with a special focus on the possible treatments by stem cells or their derived EVs.

Mohanavel, V., Ashraff Ali, K. S., Ranganathan, K., Allen Jeffrey, J., Ravikumar, M. M., & Rajkumar, S. (2021). *The roles and applications of additive manufacturing in the aerospace and automobile sector*. 47, 405–409. Scopus. https://doi.org/10.1016/j.matpr.2021.04.596

#### Abstract

Additive manufacturing or 3D printing is one of the developing technologies of the manufacturing field. 3D printing is establishing its power and potential in various areas by implementing new processing techniques of 3D printing over the world. 3D Printing is proving its efficiency in fabricating 3D models, especially in aerospace, automobile, medical etc. The existing and nonexisting components in various fields can be produced by scanning or designing the particular components through designing software. We can print them through a 3D printer. Using additive manufacturing, we can make stronger and light-weighted products within a short period. The components can also be manufactured through various plastic and metal materials. Rapid prototyping is one of the time-saving processes of 3D printing in the aerospace and automobile industries. Nowadays, 3D printing is developing to solve human health issues by printing the human organs through the tissues of a particular human. It is a time-saving and cost-efficient technique. If we compare the other traditional manufacturing techniques with additive manufacturing, AM is environmentally friendly to both nature and humans. The safety provided by the AM products is also well and good. Raw material wastages can be prevented. Here we review the topics regarding additive manufacturing techniques, 3D printing in the automobile and aerospace field.

### Teklemariam, A. T., & Cochrane, L. (2021). The rush to the peripheries: Land rights and tenure security in Peri-Urban Ethiopia. *Land*, 10(2), 1–20. Scopus. https://doi.org/10.3390/land10020193

#### Abstract

As the global population continues to urbanize, increasing pressure is put upon urban centers and the carrying capacity of the already built-up areas. One way to meet these demands is horizontal expansion, which requires new lands to become incorporated into urban centers. In most cases, this demand is met by converting peri-urban land into urban land as the urban center expands. These processes of expansion into the peri-urban, however, create tension regarding land use and land rights, and may foster tenure insecurity if not well managed. As in many countries, Ethiopia is experiencing extensive urban population growth and the peri-urban areas at the edge of urban centers are under pressure. This study investigates land rights issues and tenure security conditions of peri-urban farmers in the case study sites of Addis Ababa and Hawassa. The findings reveal that urban expansion into the peripheral agricultural lands and the resulting tenure system change has caused intense perceived tenure insecurity among peri-urban farmers. The range of land rights exercised differs in these two sites, as measured by the property rights analytical framework. Periurban farmers in Hawassa hold weak owner positions, enabling them to exercise thicker rights. However, peri-urban farmers in Addis Ababa hold weak claimant positions, which is slightly above the operational level right of an authorized user. This analysis suggests that the urban development and expansion strategies adopted by the respective city administrations are impacting land rights of the peri-urban farmers and their tenure security, albeit in unique ways, from which lessons can be drawn about how urban expansion policies can be more appropriately designed and implemented.

Stark, H., Omer, A., Wereme N'Diaye, A., Sapp, A. C., Moore, E. V., & McKune, S. L. (2021). The Un Oeuf study: Design, methods and baseline data from a cluster randomised controlled trial to increase child egg consumption in Burkina Faso. *Maternal and Child Nutrition*, *17*(1). Scopus. https://doi.org/10.1111/mcn.13069

#### Abstract

In many low-income countries, such as Burkina Faso, rates of malnutrition are high among children. Research indicates that animal source foods may provide important elements to improve growth and development of young children, especially during periods of rapid development, such as the first 1,000 days of life. The Un Oeuf study is designed to test an innovative behaviour change communication strategy to increase egg consumption in children 6-24 months in Burkina Faso, thereby improving dietary diversity and nutritional outcomes. This 1-year cluster randomised controlled trial tests whether the gifting of chickens by a community champion directly to a child, combined with a behaviour change package of integrated poultry management and human nutrition trainings, can significantly increase egg consumption among children under 2 years in rural communities where egg consumption is very low. The nutrition-sensitive behaviour change package is designed to increase egg consumption through improving livestock production, women's empowerment and food security at the household level. This paper presents a detailed account of the study design and protocol for the Un Oeuf study, alongside a description of the study population. Baseline data show a study population with high rates of malnutrition (stunting 21.6%, wasting 10.8% and underweight 20.4%) and a very low rate of egg consumption—less than 10% among children. Although poultry production is quite common, egg consumption is low reportedly because of cultural norms, including widespread practice of allowing eggs to hatch and a lack of knowledge about the nutritional benefits of egg consumption.

### Cochrane, L. (2021). The United Arab Emirates as a global donor: What a decade of foreign aid data transparency reveals. *Development Studies Research*, 8(1), 49–62. Scopus. https://doi.org/10.1080/21665095.2021.1883453

#### Abstract

The United Arab Emirates (UAE) has become a leading contributor of foreign aid, in terms of percentage of gross national income as well as in total amount. Historically, Emirati aid was

opaque, and little was known about the foreign aid portfolio. This changed after 2009 when the UAE began to submit detailed, project-level data to the Development Assistance Committee of the OECD. Based on a decade of aid transparency, this article carries out an examination of the political economy of aid provided by the UAE, comparing its portfolio to other donor countries. Particular attention is paid to analyzing three primary recipients of its aid (Egypt, Serbia and Yemen) and the implicit motivations driving those decisions. The majority of Emirati aid to these three countries was granted as general budgetary support, often in tandem with efforts to achieve political, economic and/or military aims. Based on the findings, an evaluation is made regarding Emirati narratives of South-South cooperation and its seeking of mutual benefit as well as critiques put forward within the literature countering this. In addition to critically assessing the details of an under-researched aid portfolio, this paper highlights areas for further study to deepen our understanding of the UAE's foreign aid.

### Gezhagn, T. M., Temam, A. G., & Lelisho, T. A. (2021). Theoretical study on chemical fixation of carbon dioxide with aziridine into cyclic carbamate catalysed by purine/HI system. *Molecular Physics*, *119*(5). Scopus. https://doi.org/10.1080/00268976.2020.1831637

#### Abstract

The cycloaddition of carbon dioxide with aziridine into cyclic carbamate catalysed by purine/HI has been investigated using exchange–correlation functional B3LYP of DFT and the 6-31+G(d,p) basis set for non-iodine atoms and the LANL2DZ for iodine in order to understand the catalytic efficiency of purine/HI system. Two hypothetical reaction mechanisms were proposed for the studied reaction in each catalyst systems. Thermodynamic and kinetic parameters were computed for each step to determine the more favourable route. The calculations reveal that the reaction prefers to proceed through a three-step mechanism in both purine and purine/HI catalyst system. HI plays a co-catalytic role to promote the initial ring-opening of aziridine. The obtained results emphasise purine/HI system had better catalytic efficiency than purine and mechanism II of purine/HI catalysed reaction is more favourable than mechanism I. The more favourable pathway comprises three steps such as ring-opening of aziridine by iodine anion, CO2 insertion and ring-closure. The CO2 insertion step was determined as barrierless. The ring-opening of aziridine was rate-determining step which requires 16.79, 16.33, and 15.94 kcal/mol in the gas phase, water and

diethyl ether (better), respectively. Finally, this work endorsed that purine/HI is an effective catalyst for CO2 fixation with aziridine.

#### Hua, H., & Wondirad, A. (2021). Tourism network in urban agglomerated destinations: Implications for sustainable tourism destination development through a critical literature review. *Sustainability (Switzerland)*, 13(1), 1–16. Scopus. https://doi.org/10.3390/su13010285

#### Abstract

This study analyzes tourism network in urban agglomerated destinations and puts forth implications for future sustainable development through a critical and extensive review of related literature. First of all, with a bibliometric analysis of 2670 selected articles from three research fields of urban tourism, urban agglomeration tourism and tourism destination network, we analyzed their respective research themes and classified them accordingly. Then, the study further investigates the role of tourism network in urban agglomerated destinations by identifying the differences and connections between urban agglomeration tourism and urban tourism. Finally, a basic architecture is established for the study of tourism networks in urban agglomerated destinations context. Study findings highlight that urban agglomeration tourism emphasizes the interconnectivity and social network relationships. However, research on the destination network of urban agglomerations is limited, especially from the tourism development perspectives. Therefore, the evolution process, structural effects, determinants and dynamic mechanisms of the tourism network in urban agglomerated destination are among the opportunities for future research. Moreover, the research architecture shows that the network relationship emerges as a new direction for the study of urban agglomeration system to better integrate and harness destinations' resources and thereby promote sustainable development in urban agglomerated areas.

Dasa, T. T., Geta, T. G., Yalew, A. Z., Abebe, R. M., & Kele, H. U. (2021). Toxoplasmosis infection among pregnant women in Africa: A systematic review and meta-analysis. *PLoS ONE*, *16*(7 July). Scopus. https://doi.org/10.1371/journal.pone.0254209

#### Abstract

The epidemiology of toxoplasmosis in pregnancy is a major issue in public health. Toxoplasmosis is caused by the protozoan parasite. Toxoplasma parasite is at high risk for life-threatening diseases during pregnancy. Congenital toxoplasmosis results from a maternal infection acquired during gestation. Therefore, this systematic review and meta-analysis was aimed to determine the seropositive prevalence of toxoplasmosis infection among pregnant women who attended antenatal care in a health facility in Africa. A systematic review and meta-analysis of published and unpublished studies were included. Databases such as MEDLINE, PubMed, EMBASE, CINAHL, Web of Science, African Journals Online were used with relevant search terms. The quality of the articles was critically evaluated using the tool of the Joanna Briggs Institute. Data were extracted on Microsoft word 2016. Meta-analysis was conducted using STATA 14 software. The heterogeneity and publication bias were assessed using the I2 statistics and Egger's test, respectively. Forest plots were used to present the pooled prevalence and odds ratio with a 95% confidence interval of meta-analysis using the random effect model. In total, 23 studies comprising 7,579 pregnant women across ten countries in Africa were included in this meta-analysis. The overall prevalence of seropositive toxoplasmosis among pregnant women in Africa was 51.01% (95% CI; 37.66, 64.34). The heterogeneity test showed that heterogeneity was high, I2 = 99.6%, P-value < 0.001. The variables responsible for the source of heterogeneity were included from Cameroon, the Democratic Republic of Congo, and Ethiopia. Overall prevalence of toxoplasmosis in Africa showed that more than one-half of pregnant women were infected. The risk of acquiring toxoplasmosis infection during pregnancy is high; hence, preventive measures to avoid exposure of pregnant women to Toxoplasma infection should be strictly applied.

Tracking development assistance for health and for COVID-19: a review of development assistance, government, out-of-pocket, and other private spending on health for 204 countries and territories, 1990–2050

Galles, N. C., Liu, P. Y., Updike, R. L., Fullman, N., Nguyen, J., Rolfe, S., Sbarra, A. N., Schipp, M. F., Marks, A., Abady, G. G., Abbas, K. M., Abbasi, S. W., Abbastabar, H., Abd-Allah, F., Abdoli, A., Abolhassani, H., Abosetugn, A. E., Adabi, M., Adamu, A. A., ... Yuce, D. (2021). Measuring routine childhood vaccination coverage in 204 countries and territories, 1980–2019: A systematic analysis for the Global Burden of Disease Study 2020, Release 1. *The Lancet*, 398(10299), 503–521. Scopus. https://doi.org/10.1016/S0140-6736(21)00984-3

#### Abstract

#### Background

The rapid spread of COVID-19 renewed the focus on how health systems across the globe are financed, especially during public health emergencies. Development assistance is an important source of health financing in many low-income countries, yet little is known about how much of this funding was disbursed for COVID-19. We aimed to put development assistance for health for COVID-19 in the context of broader trends in global health financing, and to estimate total health spending from 1995 to 2050 and development assistance for COVID-19 in 2020.

#### Methods

We estimated domestic health spending and development assistance for health to generate total health-sector spending estimates for 204 countries and territories. We leveraged data from the WHO Global Health Expenditure Database to produce estimates of domestic health spending. To generate estimates for development assistance for health, we relied on project-level disbursement data from the major international development agencies' online databases and annual financial statements and reports for information on income sources. To adjust our estimates for 2020 to include disbursements related to COVID-19, we extracted project data on commitments and disbursements from a broader set of databases (because not all of the data sources used to estimate the historical series extend to 2020), including the UN Office of Humanitarian Assistance Financial Tracking Service and the International Aid Transparency Initiative. We reported all the historic and future spending estimates in inflation-adjusted 2020 US\$, 2020 US\$ per capita, purchasing-power parity-adjusted US\$ per capita, and as a proportion of gross domestic product. We used various models to generate future health spending to 2050.

#### Findings

In 2019, health spending globally reached \$.\$ trillion (95% uncertainty interval [UI] \$.7-\$.\$) or \$1132 (1119–1143) per person. Spending on health varied within and across income groups and geographical regions. Of this total, \$40.4 billion (0.5%, 95% UI 0.5-0.5) was development assistance for health provided to low-income and middle-income countries, which made up 24.6% (UI 24.0-25.1) of total spending in low-income countries. We estimate that \$54.8 billion in development assistance for health response. \$12.3 billion was newly committed and \$1.4 billion was repurposed from existing health projects. \$3.1 billion (22.4%) of the funds focused on country-level coordination and \$2.4 billion (17.9%) was for supply chain and logistics. Only \$714.4 million (7.7%) of COVID-19 development assistance for health went to Latin America, despite this region reporting 34.3% of total recorded COVID-19 deaths in low-income or middle-income countries in 2020. Spending on health is expected to rise to \$1519 (1448-1591) per person in 2050, although spending across countries is expected to remain varied.

#### Interpretation

Global health spending is expected to continue to grow, but remain unequally distributed between countries. We estimate that development organisations substantially increased the amount of development assistance for health provided in 2020. Continued efforts are needed to raise sufficient resources to mitigate the pandemic for the most vulnerable, and to help curtail the pandemic for all. Funding: Bill & Melinda Gates Foundation.

Woldesemayat, E. M., & Azeze, Z. (2021). Treatment outcome of tuberculosis at Dilla Referral Hospital, Gedeo Zone, southern Ethiopia: A retrospective study. *PLoS ONE*, *16*(4 April). Scopus. https://doi.org/10.1371/journal.pone.0249369

#### Abstract

#### Background

Tuberculosis (TB) is one of the major public health problems in Ethiopia. Determining treatment outcome of TB cases could help to understand the effectiveness of TB control efforts. The objective of this study was to assess TB treatment outcome and associated factors and determine the risk factors of death among TB cases who were on Directly Observed Treatment Short course (DOTS).

#### Methodology

We analyzed a retrospective data for TB cases who were on DOTS at Dilla Referral Hospital from July 2011- June 2016. The study population was TB cases with known HIV status and whose treatment outcome was evaluated at the Hospital. Data were entered, cleaned and analyzed using statistical package SPSS for windows, version 20.

#### Result

Out of 899 registered TB cases, 731 included in this analysis. Of these cases, 424 (58.0%) were male and 334 (45.7%) were in the age group of below 25 years. Treatment success rate of TB was 675 (92.3%) and death rate was 18 (2.5%). Treatment outcome showed statistically significant variation by HIV status (P < 0.001). HIV status of the TB cases and pretreatment weight were associated with TB treatment outcome. HIV status of the TB cases was associated with death of the TB cases (Adjusted Odds Ratio (AOR) 5.0; CI 95%: 1.8–13.5).

#### Conclusion

TB treatment success rate found in this study was high. Patient's weight and HIV status were associated with treatment outcome. Moreover, HIV status predicted death of TB cases. Cautious treatment follow-up and defaulter tracing mechanisms for TB cases with these risk factors were suggested.

Wondimu, M. T., Nigussie, Z. A., & Yusuf, M. M. (2021). Tree species diversity predicts aboveground carbon storage through functional diversity and functional dominance in the dry evergreen Afromontane forest of Hararghe highland, Southeast Ethiopia. *Ecological Processes*, 10(1). Scopus. https://doi.org/10.1186/s13717-021-00322-4

#### Abstract

#### Background

Regarding the most important ecological challenges, scientists are increasingly debating the relationship between biodiversity and ecosystem function. Despite this, several experimental and theoretical researches have shown inconsistencies in biodiversity and ecosystem function relationships, supporting either the niche complementarity or selection effect hypothesis. The relationship between species diversity, functional diversity, and aboveground biomass carbon was investigated in this study employing standing aboveground carbon (AGC) stock as a proxy measure for ecosystem function. We hypothesized that (i) effects of diversity on AGC can be

transmitted through functional diversity and functional dominance; (ii) effects of diversity on AGC would be greater for functional dominance than functional diversity; and (iii) effects of functional diversity and functional dominance on carbon stock varied with metrics and functional traits. Community-weighted means (CWM) of functional traits (wood density, specific leaf area, and maximum plant height) were calculated to assess functional dominance (selection effects). As for functional diversity (complementarity effects), multi-trait functional diversity (selection effects) indices were computed. We tested the first hypothesis using structural equation modeling. For the second hypothesis, the effects of environmental variables such as slope, aspect, and elevation were tested first, and separate linear mixed-effects models were fitted afterward for functional diversity, functional dominance, and the two together.

#### Results

Results revealed that slope had a significant effect on aboveground carbon storage. Functional diversity and functional dominance were significant predictors of the aboveground carbon storage (22.4%) in the dry evergreen Afromontane forest. The effects of species richness on aboveground carbon storage were mediated by functional diversity and functional dominance of species. This shows that both the selection effects and the niche complementarity are important for aboveground carbon storage prediction. However, the functional diversity effects (niche complementarity) were greater than functional dominance effects (selection effects).

#### Conclusions

Linking diversity and biodiversity components to above ground carbon provides better insights into the mechanisms that explain variation in above ground carbon storage in natural forests, which may help improve the prediction of ecosystem functions.

Bovas Herbert Bejaxhin, A., Balamurugan, G. M., Sivagami, S. M., Ramkumar, K., Vijayan, V., & Rajkumar, S. (2021). Tribological Behavior and Analysis on Surface Roughness of CNC Milled Dual Heat Treated Al6061 Composites. *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/3844194

#### Abstract

Dual heat treatment (DHT) effect is analyzed using the machining of Al6061-T6 alloy, a readily available material for quickly finding the machining properties. The heat treatments are conducted twice over the specimen by the furnace heating before processing through CNC machining. The HSS and WC milling cutters are preferred for the diameter of 10 mm for the reviewed rotational

speeds of 2000 rpm and 4000 rpm, and the constant depth of cut of 0.5 mm is chosen based on various reviews. Worthy roughness could be provided mostly by the influence of feed rates preferred here as 0.05 mm/rev and 0.1 mm/rev. The influencing factors are identified by the Taguchi, genetic algorithm (GA), and Artificial Neural Network (ANN) techniques and compared within it. The simulation finding also helps to clarify the relationship between influenced machining constraints and roughness outcomes of this project. The average values of heat treated and nonheat treated Al6061-T6 are compared and it is to be evaluated that 41% improvement is obtained with the lower surface roughness of 1.78975 µm and it shows good surface finish with the help of dual heat treatment process.

### Woldesemayat, E. M. (2021b). Tuberculosis in migrants is among the challenges of tuberculosis control in high-income countries. *Risk Management and Healthcare Policy*, 14, 2965–2970. Scopus. https://doi.org/10.2147/RMHP.S314777

#### Abstract

The incidence of tuberculosis (TB) is high among migrants in high-income countries. The migration process could contribute to the high incidence of TB among them. Achieving TB elimination from these settings will be difficult unless countries address the burden of TB among migrants. The aim of this review was to describe the challenges of international migration on TB control in high-income, low TB incidence countries. Among migrants, there is a high prevalence of risk factors for TB, such as exposure to TB, HIV, malnutrition, substance use, delayed diagnosis, low education, poor health-seeking, the culture, stigma and marginalization. Discriminatory policies of TB care and social barriers such as language, cultural issues and unfriendly health services may also contribute to the high prevalence of TB among them. TB control among migrants in these settings is important as migrants are vulnerable to TB infection and disease, and implementing TB care among them is difficult; it is important to reduce the TB burden in migrants and the community at large and the high risk of multidrug-resistant TB (MDR-TB). TB elimination from high-income countries requires acquiring data and analyzing it to measure the burden, having migrant-sensitive health systems, having policy and legal frameworks and multi-country partnerships and conducting research.

Chaka, D. S., & Oda, T. K. (2021). Understanding land surface temperature on rift areas to examine the spatial variation of urban heat island: The case of Hawassa, southern Ethiopia. *GeoJournal*, *86*(2), 993–1014. Scopus. https://doi.org/10.1007/s10708-019-10110-5

#### Abstract

Examining the spatial variation of surface temperature is an important criterion to create livable urban environment. To examine the cause of heat island variation in the study area located within the rift zones, an algorithm that was prepared for Landsat 8 band 10 were used by taking the Normalized Difference Vegetation Index threshold method for the estimation of ground emissivity by integrating with the result obtained from MODIS night time data. The LU/LC (land use land cover) maps of the area were prepared with better accuracy using on screen classification technique. The derived LST showed that the surface temperature of the city ranges from 20.6 to 41.30 °C and the minimum temperature of the area was observed within the lake and the surrounding areas such as wetland. The maximum temperature was registered on the scattered hills and excavation areas and some parts of bare lands including industrial park of the city. The spatial variation of LST (Land Surface Temperature) in the city is the result of three major factors namely: (1) volcanic products of the geological setting, (2) the nature of the rock (high reflectance) and (3) the LU/LC type. Increasing of evergreen tree cover and rehabilitation of existing mining areas are among the recommended strategy to mitigate the UHI (urban heat island) effects in the city. For future studies in areas that are susceptible to natural heat sources, the satellite data should have high spatial resolution and derived from multiple sensors and satellites that can provide better tools to understand the UHI effect considering the geological setting of the area.

# Joshi, S., Stalin, S., Shukla, P. K., Shukla, P. K., Bhatt, R., Bhadoria, R. S., & Tiwari, B. (2021). Unified Authentication and Access Control for Future Mobile Communication-Based Lightweight IoT Systems Using Blockchain. *Wireless Communications and Mobile Computing*, 2021. Scopus. https://doi.org/10.1155/2021/8621230

#### Abstract

The Internet of Things (IoT) is a new revolution defined by heterogeneous devices made up of intelligent, omnipresent items that are all hooked up to The internet. These devices are frequently implemented in different areas to offer innovative programs in various industrial applications,

including intelligent urban, medicine, and societies. Such Internet of Things (IoT) equipment generates a large volume of private and safety information. Because IoT systems are resourceconstrained in terms of operation, memory, and communication capability, safeguarding accessibility to them is a difficult task. In the blockchain concept, the majority, or even all network nodes, check the validity and accuracy of exchanged data before accepting and recording it, whether this data is related to financial transactions, measurements of a sensor, or an authentication message. In evaluating the validity of exchanged data, nodes must reach a consensus in order to perform a special action, in which case the opportunity to enter and record transactions and unreliable interactions with the system is significantly reduced. Recently, in order to share and access management of IoT devices' information with a distributed attitude, a new authentication protocol based on blockchain has been proposed, and it is claimed that this protocol satisfies user privacy while preserving security. Today's identification and authentication techniques have substantial shortcomings due to rapidly growing prevalence and implementation. As a result, the protection of such gadgets is critical to guarantee the program's efficacy and safety. A decentralized authentication and access control method for lightweight IoT systems are proposed in this work and a blockchain-based system that enables identification and secures messaging with IoT nodes. The technique is built on fog information systems and the idea of a blockchain system; when contrasted to something like a blockchain-based verification system, the testing findings show that the suggested mechanism outperforms it. The authentication and verification system undergoes using the blockchain technique. Our method takes advantage of blockchain's inherent advantages while also associated with development authentication systems. Our suggested blockchain-based approach, structure, and layout, in particular, provide for transparency, consistency, and provenance while also providing tamper-proof records. The article describes the general systems architectural style and the analysis and execution of a real scenario as just a prototype system. The authentication included give as protected prototype that can transmit data with secured protocol and achieves minimum error rate.

Asefa, A. (2021). Unveiling respectful maternity care as a way to address global inequities in maternal health. *BMJ Global Health*, 6(1). Scopus. https://doi.org/10.1136/bmjgh-2020-003559

#### Abstract

This study is based on the evidence collected during the "Technical e-Learning Course on Wastewater Treatment", an international training project developed in 2020 in Italy by the Hvdroaid Association, in collaboration with Turin Polytechnic. This work intended to address the sustainability of urban sanitation in various African countries, which the world of international cooperation has been looking at in recent years with growing interest. A comparative analysis of the current strategies and technological solutions was conducted. Data and information reported by the project participants were elaborated and verified. Four African countries-Benin, Egypt, Ethiopia, and Malawi-were considered and two relevant case studies among those proposed by the participants were presented. Starting from this analysis, significant elements about the status and coverage of wastewater management were extracted and reported. The analysis of existing wastewater treatment plants (WWTPs) allowed evaluating their design features and current status of operation. Considerations about the environmental, economic, social, and technical sustainability of wastewater treatment and management were finally reported. Conducting such an analysis provided support in identifying the best practices and the most recurrent problems linked to the various African contexts, which need to be considered for a complete definition of the planning strategy for accessible, efficient, and sustainable sanitation infrastructures.

Almebo, A., Mangasha, H. B., Ashuro, Z., Soboksa, N. E., Kanno, G. G., Negassa, B., Mangasha, A. E., Ayinalem, A. E., & Aregu, M. B. (2021). Utilization of Community-Level Fluoride-Filtered Water and its Associated Factors in Dugda Woreda of East Shewa Zone, Oromia Region, Ethiopia. *Environmental Health Insights*, *15*. Scopus. https://doi.org/10.1177/11786302211052384

#### Abstract

#### Background

Long-term consumption of water containing an excessive amount of fluoride causes dental and skeletal fluorosis. De-fluoridation options differ in terms of scale, efficacy, long-term viability,

and user acceptance. Therefore, this study aimed to identify the challenges of using fluoridefiltered water and its associated factors among households.

#### Methods

A cross-sectional study was conducted from April to May, 2018 among 405 randomly selected households in Dugda Woreda of Ethiopia Rift Valley East Shewa Zone, Oromia Region. A structured interviewer-administered questionnaire was used to collect the data. SPSS version 20 was used to enter and analyze the collected data. Logistic regression analysis was used to identify association between dependent and independent factors and explained by odds ratio with 95% CI.

#### Results

A total of 228 (56.3%) households were found to utilize fluoride filtered water from community water supply schemes for drinking and cooking purposes. No family history of fluorosis (AOR = 44.4, 95%CI: 18.8, 104.74), monthly income of less than 1000 ETB (AOR = 0.03, 95%CI: 0.004, 0.23), good knowledge of community fluoride filter schemes (AOR = 5.93, 95%CI: 1.30, 26.9), and not afford to pay bill of  $\geq 0.50$  ETB [AOR = 0.4, 95%CI: 0.20, 0.91] were factors significantly associated with utilization of community-level fluoride-filtered water.

#### Conclusion

In this study, more than half of the households used fluoride filtered water. Family monthly income, affordability, presence of family members with the history of fluoride exposure, and knowledge about community fluoride filter schemes were factors significantly associated with utilization of community-level fluoride-filtered water.

Muluneh, A. A., Kassa, Z. Y., Mamo, Z. B., & Hadra, N. (2021). Utilization utilization of of antenatal antenatal care care and and associated associated factors factors in in gedeo gedeo zone, zone, southern southern Ethiopia Ethiopia. *Ethiopian Journal of Reproductive Health*, 13(1), 40–49. Scopus.

#### Abstract

#### Background

Antenatal (ANC) is care given for pregnant women with the purpose of prevention, early detection of existing disease, and treating health and health-related problems for both mother and unborn baby. The purpose of this study was to assess the utilization of ANC and associated factors in the Gedeo zone.

#### Method

A community-based cross-sectional study was carried out from August 1 to September 30, 2018, among women of reproductive age (15-49 years) in Gedeo zone Southern Ethiopia. A stratified, two-stage cluster sampling technique was used to select the study population. The study population was selected from the respective source population using a simple random sampling technique. Data was checked, coded and entered into Epi data version 3.1 and exported to SPSS version 20.0 for analysis. The wealth index was computed using principal component analysis. Descriptive statistics was employed to display the study findings. Bivariate and multivariable analyses were computed to identify the determinants of utilization ANC.

#### Results

Utilization of at least one ANC contact was 72.6% (95% CI: 69.3, 75.8).Women with highest wealth index (rich) and grand multigravida were more likely utilize ANC contact. Whereas when the husband's education status was secondary and above, there were lower odds of utilization of ANC contact.

#### Conclusion

ANC utilization in the Gedeo zone is low. The highest wealth index (rich) and grand multigravida were more likely to utilize ANC services. Therefore, the minister of health, regional health offices and stakeholders should work to improve wealth of women and families to increase the utilization of ANC contact.

Borrell, J. S., Gebremariam, Z., & Abebe, W. M. (2021). Utilize existing genetic diversity before genetic modification in indigenous crops. *Nature Biotechnology*, *39*(9), 1064–1065. Scopus. https://doi.org/10.1038/s41587-021-01048-6

#### Abstract

#### **Objectives**

Supportive care needs survey short form has a total of 34 items that have 5 domains that measure the unmet needs of cancer patients. It is important to validate this tool since there are differences in culture, geographic areas, and clinical care service which influence patients' needs. Therefore, this study aimed to assess the construct validity and reliability of the tool.
#### Methods

The study was conducted among 170 cancer patients from April 1st to 30th 2019 in Hawassa hospital, South Ethiopia. Confirmatory factor analysis was done using fit indices. Convergent and discriminant validity was evaluated using average variance extracted and maximum shared variance respectively. Known group validity was checked using the Mann-Whitney U test. The reliability of the instrument was examined using Cronbach's alpha.

#### Results

Domains except for health system and information, and patient care and support maintained convergent and divergent validity. The remaining validity was maintained after removing items that were redundant and double loading. The average variance extracted of domains varied from 0.52-0.81. The Square of correlation between constructs was lower than the average variance extracted for the constructs. The tool had reliability r = 0.932. The root mean square error of approximation was 0.057, comparative fit index 0.954, and the other fit indices were also indicating a good fit. Known groups difference was seen by age and type of treatment taken across the different domains.

#### Conclusion

After the health system and information, and patient care, and support domain validity issues were corrected by removing 8 items, the reduced tool was found to be a valid and reliable tool. The validated tool will be valuable if included in routine cancer care in our clinical settings.

## Woldemedihn, G. M., Rueegg, C. S., Desalegn, H., Aberra, H., Berhe, N., & Johannessen, A. (2021). Validity of a point-of-care viral load test for hepatitis B in a low-income setting. *Journal of Virological Methods*, 289. Scopus. https://doi.org/10.1016/j.jviromet.2020.114057

#### Abstract

The recent launch of the first point-of-care Xpert® hepatitis B virus (HBV) viral load kit from Cepheid could help to scale up treatment for chronic hepatitis B (CHB) in resource-limited settings. This study aimed to assess the performance of the Xpert kit under field conditions in Ethiopia. One-hundred-and-thirty CHB patients with viral loads ranging from <1 log10 to&gt;7 log10 IU/mL were randomly sampled. The viral load was assessed with both the Xpert and the gold standard Abbott RealTime HBV Viral Load assay in each patient. There was a high correlation between the viral loads assessed by Xpert and Abbott (r = 0.948, p &lt; 0.001). The

Bland-Altman plot showed a small bias between the two assays, with an on average 0.23 log10 IU/mL higher viral load result of the Xpert kit; 4 samples differed by>1 log10 IU/mL. Using the treatment threshold of 2000 IU/mL in both tests, Xpert had a sensitivity of 94 %, specificity of 71 %, positive predictive value of 70 %, and negative predictive value of 95 %. In conclusion, the Xpert kit demonstrated good validity for the measurement of HBV viral load in a real-life setting.

Pace, R. M., Williams, J. E., Robertson, B., Lackey, K. A., Meehan, C. L., Price, W. J., Foster, J. A., Sellen, D. W., Kamau-Mbuthia, E. W., Kamundia, E. W., Mbugua, S., Moore, S. E., Prentice, A. M., Kita, D. G., Kvist, L. J., Otoo, G. E., Ruiz, L., Rodríguez, J. M., Pareja, R. G., ... McGuire, M. K. (2021). Variation in human milk composition is related to differences in milk and infant fecal microbial communities. *Microorganisms*, 9(6). Scopus. https://doi.org/10.3390/microorganisms9061153

#### Abstract

Previously published data from our group and others demonstrate that human milk oligosaccharide (HMOs), as well as milk and infant fecal microbial profiles, vary by geography. However, little is known about the geographical variation of other milk-borne factors, such as lactose and protein, as well as the associations among these factors and microbial community structures in milk and infant feces. Here, we characterized and contrasted concentrations of milk-borne lactose, protein, and HMOs, and examined their associations with milk and infant fecal microbiomes in samples collected in 11 geographically diverse sites. Although geographical site was strongly associated with milk and infant fecal microbiomes, both sample types assorted into a smaller number of community state types based on shared microbial profiles. Similar to HMOs, lactose, and protein were associated with differences in the microbial community structures of milk and infant feces and in the abundance of specific taxa. Taken together, these data suggest that the composition of human milk, even when produced by relatively healthy women, differs based on geographical boundaries and that concentrations of HMOs, lactose, and protein in milk and infant fecal microbial communities.

#### Abstract

This paper is concerned with the verbal derivation of Inor (which is the group's selfdesignation), formerly called Ennemor, its Amharic name, a Peripheral Western Gurage language in the southern part of Ethiopia. Conducting research on this topic is a task well worth doing, as a detailed work has not been carried out on this area. Verbal derivation applies to the verb stem and has the function of increasing or decreasing arguments, as well as conveying intensity, reciprocity or reflexivity. It may do so by affixation or by altering the stem's morpho-phonological properties. However, not all root morphemes of a simplex stem may apply to all the possible derivational processes. The linguistic data have been collected from consultants. The findings show that affixes that are involved in the verbal derivational processes in Inor are the passive prefix tə-, and the causative prefixes a - and at- that are attached to a template (Berhanu & Hetzron 2000: 39-44 for Inor, Rose 2007: 411 for Chaha). Another group of derivational morphemes (internal root-morpheme modification) increases the number of consonants vis-à-vis the simplex by reduplication of root-consonants, and insertion of an additional vowel a after the first or second root-consonant in combination with the passivizer tə-. The findings of this study also show that certain derivations are only applicable to a restricted set of root-morphemes.

#### Nigusse, T., & Gebretsadik, A. (2021). Vitamin A Supplementation Coverage and Ocular Signs among Children Aged 6-59 Months in Aleta Chuko Woreda, Sidama Zone, Southern Ethiopia. *Journal of Nutrition and Metabolism*, 2021. Scopus. https://doi.org/10.1155/2021/8878703

#### Abstract

#### Background

Periodic vitamin A supplementation to children is a cost-effective strategy to avert vitamin A deficiency. However, few pieces of evidence are available about the coverage of vitamin A supplementation at the community level in the study area. Therefore, the aim of this study was to assess vitamin A supplementation coverage and prevalence of ocular signs of vitamin A deficiency among children aged 6-59 months.

#### Methods

Community-based cross-sectional study design was conducted using a two-stage stratified random sampling method. Data were collected from mothers with children aged 6-59 months using a structured pretested questionnaire. A total of 665 children aged 6 to 59 months were examined for clinical signs and symptoms of vitamin A deficiency by trained clinical health professionals. Descriptive statistics and logistic regression were done.

#### Result

Vitamin A supplementation coverage in the study area was 36.2% (95% CI: 32.6-39.9). Overall, the prevalence of xerophthalmia was 2.7%. Age group 6-23 months (AOR: 2.1, 95% CI: 1.4-2.9), good maternal knowledge (AOR: 1.5, 95% CI: 1.2-2.1), children with high wealth status (AOR: 2.3, 95% CI: 1.4-3.8), precampaign health education on vitamin A (AOR: 3.4,95% CI: 2.1-5.6), member of Health Development Army (AOR: 2.7, 95% CI: 1.7-4.2), and access to health facility within <30 minutes (AOR: 2.5, 95% CI: 1.6-3.8) were significantly associated with the receipt of vitamin A capsule.

#### Conclusion

Vitamin A supplementation coverage of the study area was low as compared to the UNICEF threshold of 70%. Vitamin A deficiency is a public health problem in the study area. Increasing maternal level of knowledge, precampaign health education on vitamin A supplementation, and strengthening Health Development Army are recommended to increase the vitamin A supplementation coverage.

Mishra, P., Aggarwal, P., Vidyarthi, A., Singh, P., Khan, B., Alhelou, H. H., & Siano, P. (2021). VMShield: Memory Introspection-Based Malware Detection to Secure Cloud-Based Services against Stealthy Attacks. *IEEE Transactions on Industrial Informatics*, *17*(10), 6754–6764. Scopus. https://doi.org/10.1109/TII.2020.3048791

#### Abstract

With the rapid evolution of the industrial Internet, cloud service has emerged as a next-generation industrial standard that has the potential to revolutionize and transform the enterprise industry. In recent years, numerous enterprises have acknowledged the benefits of cloud-based service models. However, the security issues are a major concern, such as stealthy malware attacks against virtual domains. In this article, we propose an introspection based security approach, called VMShield for

securing virtual domains in a cloud based service platform, which is designed to detect malware in cloud infrastructure. VMShield performs virtual memory introspection from the hypervisor (trusted-domain) to collect the run-time behavior of processes, making it impossible for the malware to evade the security tool. The use of introspection makes the proposed approach a better choice over traditional static and dynamic state-of-the-art techniques which fail to detect stealthy attacks. The VMShield extracts the system call features using Bag of n-gram approach and selects important features using the meta-heuristic algorithm, binary particle swarm optimization. Random Forest (RF) classifier is used to classify the monitored programs into benign and malign processes, making it capable of detecting the variants of malware thus, an advantage over the typical signature-matching approach. The University of New Mexico (UNM) Dataset and Bare cloud Dataset (University of California) has been used for the demonstration and validation of VMShield. The results prove that VMShield achieves a higher attack detection rate and reduced storage compared to previously proposed techniques.

## Mekuyie, M. (2021). Vulnerability of rural households to climate-induced shocks in Lokka Abaya district, Sidama zone, southern Ethiopia. *Jamba: Journal of Disaster Risk Studies*, 13(1), 1–11. Scopus. https://doi.org/10.4102/jamba.v13i1.1051

#### Abstract

This study was conducted in rural communities of Lokka Abaya district, Sidama zone, southern Ethiopia to assess vulnerability status of men and women households to climate-induced shocks and stress. This article is based on household survey, focus group discussion and key informant interviews. A total of 258 smallholder farmers were selected from three villages using stratified random sampling. A combination of social, economic and environmental indicators was employed to develop the vulnerability index of each household head and estimate quantitatively that is vulnerability is estimated as a function of adaptive capacity, exposure and sensitivity of households. The results indicated that farmers had poor access to public services including access to affordable credit, market, health services and climate information. The survey revealed that droughts, floods, soil erosion, pests and diseases were climate-related challenges in the study area. Regarding vulnerability of households to climate variability, results indicated that around 8.5% and 18.2% of male- and female-headed households, respectively, were highly vulnerable whilst

41% and 45.5% of male- and female-headed households, respectively, were moderately vulnerable. The results confirmed that 37.7% and 27.3% of male- and female-headed households, respectively, were less vulnerable. The rest 12.8% men and 9% women were not vulnerable. Therefore, there is a need to enhance access to affordable credit, market, climate information, health, income diversification of farmers, soil and water conservation and afforestation of hilly areas if farmers need to be climate resilient.

## Ketema, A., & Dwarakish, G. S. (2021b). Water erosion assessment methods: A review. *ISH Journal of Hydraulic Engineering*, 27(4), 434–441. Scopus. https://doi.org/10.1080/09715010.2019.1567398

#### Abstract

Water erosion is the removal of topsoil particles from the surface due to raindrop impact and runoff. Planning and implementation of conservation measures involve knowledge of the spatial pattern of erosion risk. For evaluating the spatial variation of soil erosion, selecting proper method of assessment is critical. The result of the review revealed that there is no single universal method that works everywhere in the world for assessing water erosion. Universal Soil Loss Equation (USLE) and its derivatives (revised [RUSLE] and modified [MUSLE]) were more popular empirical models in water erosion assessment. If the competition is between USLE and its derivatives, choose USLE or RUSLE for predicting long-time average soil loss and the area is dominated by rill and inter-rill water erosion. But, if the intention is to predict sediment yield from particular rainstorm events and the area is dominated by gully erosion, select MUSLE. Moreover, USLE is more suitable for agricultural land and low slope gradients, whereas RUSLE can be used in the nonagronomic area and a wide range of slope gradients. Water erosion assessment methods to be selected based on the intention of assessment and their appropriateness, applicability, and compliance with local conditions.

Rathore, B., Mahela, O. P., Khan, B., Alhelou, H. H., & Siano, P. (2021). Wavelet-Alienation-Neural-Based Protection Scheme for STATCOM Compensated Transmission Line. *IEEE Transactions on Industrial Informatics*, 17(4), 2557–2565. Scopus. https://doi.org/10.1109/TII.2020.3001063

#### Abstract

The custom power devices play important role for enhancing the power transfer capacity of transmission system. However, these devices introduce challenges of under reach or over reach, in the protection of transmission system. This article introduces a novel, protection algorithm based on wavelet-alienation-neural technique for STATCOM-compensated transmission system. For detecting and classifying faults, approximate coefficients are computed from the postfault quarter cycle current waveforms. Fault index, which is summation of alienation coefficients (computed by approximate coefficients) of both the buses, is computed and compared with the threshold magnitude for detecting and classifying the different faults. For the determination of fault location, artificial neural network is applied, with input as three-phase approximate coefficients, evaluated from the voltage and current signals over a time duration of a quarter cycle. Robustness of the developed scheme has been validated for various faults at different locations with varying fault impedances and angles of fault incidence.

Sathish, T., Tharmalingam, S., Mohanavel, V., Ashraff Ali, K. S., Karthick, A., Ravichandran, M., & Rajkumar, S. (2021). Weldability Investigation and Optimization of Process Variables for TIG-Welded Aluminium Alloy (AA 8006). *Advances in Materials Science and Engineering*, 2021. Scopus. https://doi.org/10.1155/2021/2816338

#### Abstract

Aluminium and its alloys play a significant role in engineering material applications due to its low weight ratio and superior corrosion resistance. The welding of aluminium alloy is challenging for the normal conventional arc welding processes. This research tries to resolve those issues by the Tungsten Inert Gas welding process. The TIG welding method is an easy, friendly process to perform welding. The widely applicable wrought aluminium AA8006 alloy, which was not considered for TIG welding in earlier studies, is considered in this investigation. For optimizing the number of experiments, the Taguchi experimental design of L9 orthogonal array type

experimental design/plan was employed by considering major influencing process parameters like welding speed, base current, and peak current at three levels. The welded samples are included to investigate mechanical characterizations like surface hardness and strengths for standing tensile and impact loading. The results of the investigation on mechanical characterization of permanent joint of aluminium AA8006 alloy TIG welding were statistically analyzed and discussed. The 3D profilometric images of tensile-tested specimens were investigated, and they suggested optimized process parameters based on the result investigations.

# Estifanos, T., Polyakov, M., Pandit, R., Hailu, A., & Burton, M. (2021). What are tourists willing to pay for securing the survival of a flagship species? The case of protection of the Ethiopian wolf. *Tourism Economics*, 27(1), 45–69. Scopus. https://doi.org/10.1177/1354816619880430

#### Abstract

Ecotourism can be an important tool for protecting biodiversity in developing countries. Tourists have preferences for viewing charismatic species and for their conservation, but our understanding of these preferences remains limited. Using choice experiment surveys, we investigate tourists' preferences and willingness to pay (WTP) for the protection of the Ethiopian wolf (Canis simensis) in Ethiopia's Bale Mountains National Park. Results from a random parameter logit model show that tourists were willing to pay up to US\$5.82/day/trip for increasing the wolf population from 200 to a more viable number of 250 but very little for a more substantial increase. Tourists also valued increases in the size of the protected area (PA) and access to the wolf habitat. The WTP is found to be dependent on tourists' prior experience to Ethiopian PAs and whether they had viewed other unique species in the park. The findings suggest opportunities for ecotourism to support the Ethiopian wolf, which is in a critical state, and that the primary motivation for tourists' support might be due to the wolf's existence value.

Fikre, R., Eshetu, K., Berhanu, M., & Alemayehu, A. (2021). What determines client satisfaction on labor and delivery service in Ethiopia? Systematic review and meta-analysis. PLoS ONE, 16(4 April). Scopus. https://doi.org/10.1371/journal.pone.0249995

#### Abstract

#### Introduction

The uptake of Health services, maternal and newborn health care outcomes are dictated by the satisfaction of clients on the service provided. Client satisfaction is one of the vital indicators to measure the quality of service. However, it is not well addressed and little evidence is existed in Ethiopia. Therefore, the purpose of this systematic review aimed to assess the prevalence and determinant of client satisfaction on labor and delivery service in Ethiopia.

#### **Methods**

This study has included published and unpublished articles. The main databases PubMed, Embase, EBSCO, Medline, CINHAL, Poplin, and the search engine like Google and Google scholar were used from June1-30/2020. Studies with observational study design which are conducted in English language and met the eligibility criteria were included in the review. Meta-analyses with random effects were performed. Data synthesis and statistical analysis were conducted using OpenMeta and CMA version 2 software.

#### **Results**

The pooled prevalence of client satisfaction on labor and delivery service in Ethiopia was 73.5% [95% CI [64.9%, 82.1%]. The pooled odds ratio showed a negative association between client satisfaction on labour and delivery service with Promptness of care [OR = 0.25; 95% CI: (0.18, 0.18)]0.34), P = 0.0001], Free service charge [OR = 0.70; 95% CI: (0.57, 0.86), P < 0.0007], Privacy during examination [OR = 0.25; 95% CI: (0.10, 0.64), P < 0.004], Respectful maternal care [OR = 0.40;95% CI: (0.19, 0.83), P = 0.01], Plan to delivered at health facility [OR = 0.49; 95% CI: (0.37, 0.66), P < 0.00001] and ANC follow-up [OR = 0.39; 95% CI: 0.24, 0.63, P < 0.0001]. Conclusions

This review revealed that client satisfaction on labor and delivery service in Ethiopia was 73.5%. Besides poor care of providers on the antepartum, intrapartum and lack compassionate and respectful care affects client satisfaction on labor and delivery service in Ethiopia.

Gebre, G. G., Isoda, H., Amekawa, Y., Rahut, D. B., Nomura, H., & Watanabe, T. (2021c). What Explains Gender Gaps in Household Food Security? Evidence from Maize Farm Households in Southern Ethiopia. *Social Indicators Research*, 155(1), 281–314. Scopus. https://doi.org/10.1007/s11205-020-02600-8

#### Abstract

Using primary data collected from 560 farm households in Dawuro zone, southern Ethiopia, this study analyzes the gender gaps in food security among male, female, and joint decision-making farm households. It examines the factors inducing gender gaps among the households of those three categories. The results show that female decision-making households have a lower probability of ensuring food-security and a higher probability of being transitionally and chronically food-insecure. Joint decision-making households showed a higher probability of falling into the chronically food-insecure category. The decomposition results show significant gender gaps between male and female decision-making households in terms of food-secure, transitory food-insecure, and chronically food-insecure categories. Overall, both the endowment and return effects account for the gaps; however, the magnitude of the effect from the return is higher than from the endowment on significant gaps in the food-secure, transitory, and chronically food-insecure is a need for policies that not only ensure equal levels of productive resources but also help households build their capacity in order to improve both transitory and chronically food insecure situations.

## Cochrane, L., & Oloruntoba, S. O. (2021). Whose voice matters in the teaching and learning of IPE? Implications for policy and policy making. *Policy and Society*, *40*(4), 545–564. Scopus. https://doi.org/10.1080/14494035.2021.1975220

#### Abstract

Critical decolonial assessments of International Political Economy (IPE) curricula have found a continued dominance of Euro-Western perspectives. However, these critical assessments have often been of specific programs or courses. In this article, we open the canvas wider in our quantitative assessment of privilege and marginalization, by conducting an analysis of IPE curricula from universities from around the world as well as of one of the most widely used introductory textbooks in the field. We find that scholars based outside of the Euro-West are

marginal, while those based in the Euro-West continue to be dominant-in all the assessed course offerings. We also find that female voices are marginal, in all locations. Knowledge production systems privilege Euro-Western male voices and perspectives, furthering a process of systemic cognitive and epistemic injustices. Building upon our analysis of teaching and learning content, this article critically reflects on the implications of when IPE meets policy, and offers avenues for the policy engagement to avoid the same processes of privileging and marginalizing, and thereby better situating policy making to avoid repeating failures resulting from the identified entrenched biases.

Gesesse, E., Fekadu, S. A., & Belete, G. T. (2021). Willingness of corneal donation and its associated factors among adult patients attending Gondar University Comprehensive and Specialized Hospital. *PLoS ONE*, *16*(8 August). Scopus. https://doi.org/10.1371/journal.pone.0256102

#### Abstract

#### Introduction

Corneal transplantation is the only treatment option for corneal blindness to restore sight. However, there is a disproportionate imbalance between the demand and supply of corneal tissue in Ethiopia. This is because accessing corneal tissue is reliant on people who are willing to donate corneas after death.

#### Objective

This study aimed to assess the proportion of willingness to donate cornea and associated factors among adult patients attending at University of Gondar comprehensive and specialized hospital.

#### Method

Institutional based cross-sectional study was conducted from July 13 to July 28, 2020, through a face-to-face interview. A total of 451 samples were selected using systematic random sampling. The data were entered into Epidemiological information version 7 and exported to statistical package for social science version 20 for formal analysis. Variables with a P-value of < 0.20 in a bi-variable logistic regression were entered into the multivariable logistic regression and those variables with a p-value of < 0.05 were taken as statistically significant. The strength of association was shown using the odds ratio with a 95% confidence interval.

#### Result

A total of 408 adults participated in this study with a response rate of 90% and the proportion of willingness to donate cornea was 179(43.90%). Participants who had a religious belief in Christianity (AOR = 3.23 (95% CI: 1.09-9.57)) and good knowledge about corneal donation (AOR = 5.45(95%CI: 2.69-11.18)) were positively associated with the willingness of corneal donation. On the other side, the age group above 43 years (AOR = 0.31(95% CI: 0.11-0.89) was negatively associated with the willingness of corneal donation.

#### Conclusion

The proportion of willingness to donate cornea 43.9% among participants attending Gondar University Comprehensive and Specialized Hospital. Age group greater than 43 years, religion of Christianity and good knowledge were associated with the willingness of corneal donation.

Mulugeta, H., Tamene, A., Ashenafi, T., Thygerson, S. M., & Baxter, N. D. (2021). Workplace stress and associated factors among vehicle repair workers in Hawassa City, Southern Ethiopia. *PLoS ONE*, *16*(4 April). Scopus. https://doi.org/10.1371/journal.pone.0249640

#### Abstract

#### Introduction

Workplace stress is a public health problem worldwide. Studies focusing on work-related stress among vehicle repair workers are scarce in African countries. The current study aimed to determine the prevalence of self-reported workplace stress and associated factors among vehicle repair workers in Hawassa City, South Ethiopia.

#### Methods and findings

A cross-sectional study design was employed among 347 vehicle repair workers from January 25 to February 22, 2019. Questionnaires were administered using interviews. Additional tools were used for weight and height measurements. The main findings were analyzed using descriptive statistics, bivariable, and multivariable logistic regression. The strength of association of variables was presented by odds ratio along with its 95% CI. The statistical assessments were considered significant at p<0.05. A total of 344 workers participated in the study. The prevalence of workplace stress among participants was 41.6% with 95% CI: (36.3–47.1). Factors associated with workplace stress were more than 10 years of work experience [AOR: 2.40; 95% CI (1.29–4.50)], work-related musculoskeletal disorder [AOR: 3.39; 95% CI (1.99–5.78)], squatting and lying work posture [AOR: 4.63; 95% CI (1.61–13.3)] and servicing large vehicles [AOR: 1.96; 95% CI (1.14–3.38)].

#### **Conclusion and recommendations**

This study showed that the overall prevalence of work-related stress was substantially high. The independently associated factors were workers' service years, symptoms of body pain, and the work environment. Preventive measures need to be implemented in vehicle repair workshops by focusing on work environment improvements.

## Ayalew, T., Yoseph, T., Petra, H., & Cadisch, G. (2021). Yield response of field-grown cowpea varieties to Bradyrhizobium inoculation. *Agronomy Journal*, 113(4), 3258–3268. Scopus. https://doi.org/10.1002/agj2.20763

#### Abstract

Cowpea [Vigna unguiculata (L.) Walp.] is a widely cultivated crop for food and animal feed, with a high potential for alleviation of climate change effects on crop production due to its biological nitrogen fixing ability. However, its yields are low in Ethiopia partly due to poor agronomic practices such as lack of improved varieties, low soil fertility, and limited input use including bioinoculants. Field experiments were conducted in the cropping seasons 2018 and 2019 at three climate change and food insecurity vulnerable sites in Ethiopia (Boricha, Dore, and Hawassa) to determine yield responses of cowpea varieties to Bradyrhizobium inoculation. Four cowpea varieties, Keti (IT99K-1122), TVU, Black eye bean, and White wonderer trailing in combination with three inoculation levels (un-inoculated or inoculated with Bradyrhizobium strains CP-24 or CP-37) were used in a factorial randomized complete block design with four replications. Results revealed significant varietal differences in crop yield and yield components over years and across sites. Averaged over the seasons, seed yield of TVU was higher by 52% compared to the lowyielding Black eye bean variety. On average of the three sites, inoculation of cowpea with strain CP-24 significantly increased seed yield (21%), pod number (16%), and 100-seed weight (13%) relative to the control. Furthermore, the interaction between variety and inoculant resulted in a significant increase in seed yield and number of pods per plant of  $TVU \times CP-24$  by 60 and 68%, respectively, as compared to the un-inoculated treatment. Overall, inoculation of the cowpea varieties TVU and White wonderer trailing with Bradyrhizobium strains CP-24 is recommended at all the three tested sites and similar agro-ecological environments for improved productivity of cowpea.









### Documents by Type