ABSTRACTS OF RESEARCH ARTICLES PUBLISHED BY HAWASSA UNIVERSITY ACADEMIC STAFF 2019



VOLUME 3

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> February 2021 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 Health and Medicine; 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 2019 in different local and international academic journals. This compiled abstract is the third volume published by the office of Vice President for Research and Technology Transfer. The fourth volume of this book is finalizing, 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; this is such an amazing "collective muscle" we have built-one that I hope endures well beyond COVID 19 pandemic.

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

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College of Social Science and Humanities

Alambo, F. I., & Yimam, H. A. (2019). Elderly Care and Social Support Systems among the Gedeo of Southern Ethiopia: Socio-cultural Contexts, Forms, Dynamics and Challenges. *African Studies Quarterly*, *18*(3), 15–28.

Abstract

This qualitative study aims at disclosing the dynamics of care and social support systems for the older adults among rural Gedeo communities. The study revealed that the long-standing social values, norms, and belief systems of the ethnic group have always prescribed families, extended families, and neighbors to respect and take care of their older members. Nonetheless, poverty in rural households, the *diffusion of urban values, and the incipient erosion of longstanding rural values, as well as the* tendency of rural youth to abandon agriculture are challenging the capacity of community members to ensure the sustained availability of adequate informal care for older adults. Though its coverage is limited to certain rural parts considered to be the most food insecure, the recently introduced Productive Safety Net Programme (PSNP) was reported to have bolstered and supplemented the challenged informal care. The article suggests that a holistic approach should be pursued to scale up the capabilities of rural households, thereby to ensure the sustained availability of informal care for older adults. The situation of vulnerable older adults inhabiting seemingly food secure *Kebeles/Woredas* [administrative divisions] requires PSNP to re-evaluate its "geographic targeting mechanism." Furthermore, the exploitative relationship between the beneficiaries of PSNP and the local moneylenders needs close follow-up at a grassroots level.

Worku, Z., & Mohammed, T. (2019). Eco-Lodges and Tourist Infrastructure Development in and Around Abijata Shalla Lakes National Park; From the Perspective of Evaluating their Sustainability.

Abstract

We tried to identify Ecolodges and other tourist infrastructures in and around Abijata Shalla Lakes National Park, the central part of Ethiopian great rift valley and evaluate their sustainability based on ecological, social and economic efficiency. The study was conducted on April 2017 using both qualitative and quantitative information sources in which the data is gathered by direct observation, secondary data from a wide range of sources within the current literatures on the topic and an indepth interview. The collected data then analyzed and interpreted by descriptive and explanatory methods of analysis to come up with results and discussions. A total of fifteen lodges were recorded in the area, of which two of them are located inside the park while thirteen of the lodges are located outside the park. However, the survey is conducted only on eight active/functioning lodges at the time of data collection only focusing on operational phase excluding the predevelopment and the construction phase. All the surveyed lodges are within 22kms radius, except one lodge which is found in 82km away from the head quarter of the park. Six of the lodges can be reached with only three kilo-meters off road driving while the rest two are in 14 and 17kms off road driving. In staffing, 94.8% of the employees are local peoples while only 5.2% of them are from other places. Electricity is the major energy source, generator is used as a backup, candles are often used for different purposes and one lodges uses solar energy. Public water is a source for a clean water supply and water from the lakes with chemical treatment, but one lodge uses ground water in addition to public and lake water. All lodges have septic tank for waste treatment and none of the lodges recycle. Generating optional energy is recommendable through proper utilization of resources by recycling as it plays a great role and is basic principle in sustainability.

Keywords: Ecological, Economic Social, Sustainable, Tourism

Menuta, F. (2019). Language Use In Multilingual Ethiopia: The Case of Southern Nations Nationalities and People's Regional State.

Abstract

This article provides a descriptive account of language use in Ethiopia by focusing on language use patterns in education, media and administration in the Southern Nations, Nationalities and People's Regional State (SNNPRS). Key informants from the regional media, education bureau, Hawassa University and the Council of Nationalities of the SNNPRS provide unique insight into the layers of complexity related to language use. The findings show linguistic rights granted to the ethnolinguistic groups enabled several languages to be codified; it enabled ethno-linguistic groups to use their language in all walks of life; it helped * Corresponding Author's E-mail: mnutafekede2012@gmail.com. Complimentary Contributor Copy 28 Fekede Menuta some groups to reconstruct their intra-group identity. The linguistic rights, however, have brought no changes for some ethno-linguistic groups as their languages still remains oral and not used institutionally. The lack of language policy and planning has created irregular language use and development patterns in institutions. Languages have also been used as a means for ethnic groups to claim administrative independence. This has been a source of conflict among different dialect speakers of similar languages. Some dialect speakers claim that their language variety is different, and that they do not understand the other dialects of the language. Some dialect speakers decline from using any of the other dialects institutionally lest its use may cause a challenge to intergroup identify. This study suggests language use policy and language planning actions in Ethiopia.

Keywords: Diversity, Ethiopia, Multilingualism, Policy, Rights

Matewos, T.(2019b). Deconstructing institutional roles in climate change adaptation: The case of local public institutions in drought-prone districts of Sidama, Southern Ethiopia. *Environmental Science & Policy*, *98*, 47–53.

Abstract

Local institutions play pivotal role in climate change adaptation though less attention has been given to them compared with other components of adaptation. The conventional approach to study local institutional roles focuses on how institutions can support climate change adaptation with little emphasis to other institutional dimensions. Thus, the current study deconstructs the conventional institutional roles in climate change adaptation to reframe them on broader institutional dimensions inspired by Young (2002). Data were collected from households, experts and community leaders on institutional frontiers of local public local institution. The study used mixed methods to analyse the data. The findings indicated that despite the presence of institutional set ups, most of the national policy provisions had not been implemented at local levels due to various reasons. Further, even the implemented policies had limited success because of lack of participation in policy making processes, absence of policy implementation guidelines and limited institutional capacity. The study also revealed very weak coordination among institutions working on climate change adaptation. As the result, climate adaptation policy implementation lack continuity, monitoring and evaluation system, and failed to yield transformative changes to the farmers. Therefore, there is an urgent need to participate, capacitate, and synergize local institutions, and establish policy monitoring and evaluation system so that national policy provisions can yield intended results.

Keywords: Deconstructing: Local public institutions; Climate change adaptation; Drought-prone districts; Sidama

Matewos, T. (2019a). Climate Change-Induced Impacts on Smallholder Farmers in Selected Districts of Sidama, Southern Ethiopia. *Climate*, 7(5), 70.

Abstract

Different factors control the types of adaptive strategies and likelihoods of experiencing climate change-induced impacts by smallholder farmers. By using a mixed research method, this study examines the types and determinants of climate change-induced impacts on smallholder rural farmers in drought-prone low lands of Sidama, Southern Ethiopia. Randomly selected (401) households were surveyed on climate change-induced impacts. Longitudinal climatic data were also collected from the Ethiopian National Meteorological Agency to assess the trend of rainfall (RF), temperature and drought incidents. The analyses of the data revealed that RF and temperature had shown decreasing and increasing trends, respectively, during the three decades under consideration (1983-2014). These changes in RF and temperature exposed farmers to climaterelated epidemics, drought, harvest loss, and hunger. The logit model results revealed that different factors control the likelihood of exposure to climate change-induced impacts. The findings revealed that literacy level, involving women in family decisions and farmers' involvement in adaptation planning, reduces the likelihood of exposure to climate change-induced hunger. Therefore, there is a need to work on human capital of the farmers through expanding education, strengthening women's participation in family decision-making, and by improving public participation in climate change adaptation undertakings to minimize climate change-induced impacts.

Keywords: Climate change-induced impacts; Smallholder farmers; Drought-prone low lands; Rural Sidama; Southern Ethiopia

Matewos, T., & Tefera, T. (2020). Local level rainfall and temperature variability in droughtprone districts of rural Sidama, central rift valley region of Ethiopia. *Physical Geography*, *41*(1), 36–53.

Abstract

The purpose of this study is to examine local level spatiotemporal rainfall and temperature variability in drought-prone districts of rural Sidama, Central Rift Valley region of Ethiopia. The study used 129 gridded monthly rainfall and temperature data of 32 years (1983–2014). The gridded rainfall and temperature records were encoded into GIS software and evaluated through different statistical and geospatial techniques. Mann-Kendal rank test and F distribution tests were used to test temporal and spatial statistical significance, respectively, of the data. The analysis revealed that *Belg* and *Kiremt* are the main rainfall amounts appear to have decreased over time, the decreasing trend is statistically significant only for *Belg* rainfall records. On the other hand, rainfall standard anomaly results indicated seven droughts of different magnitudes: one extreme, two severe, and four moderate. The study also revealed increasing temperature trends over the years under consideration that are statistically significant. The findings of this study on rainfall contradict other findings obtained around the study area. Thus, climate change adaptations need to focus on location-specific climate data analysis so that the intended adaptive interventions can be successful

Keywords: Rainfall, Temperature, Drought-prone district, Rural sidama, Central rift Valley region, Ethiopia

Lemma, M. D., & Cochrane, L. (2019). Policy coherence and social protection in Ethiopia: Ensuring no one is left behind. *Societies*, 9(1), 19.

Abstract

Ethiopia has made a strong commitment to strengthen its social protection system. However, resource constraints pose significant challenges in seeking to meet the basic needs of all people. We employ a qualitative research design to identify issues of policy incoherence, within the social protection policy and in relation to other sectoral policies. Policy incoherence has high costs. Strengthening policy coherence is necessary to improve the utilization of limited resources and set a pathway through which the government can ensure no one is left behind. We also present examples of implementation coherence, which provide insight into viable means through which improved policy coherence might be pursued.

Keywords: Ethiopia; social protection; policies; SDGS; leaving no one behind

Dejene, M., & Cochrane, L. (2019). Ethiopia's developmental state: A building stability framework assessment. *Development Policy Review*, 37, O161–O178.

Abstract

Ethiopia has been lauded for its economic growth and progress in human development indicators. For some, that success is rooted in the developmental state approach advocated by the government. For others, the theory of the developmental state and the practice in Ethiopia were often at odds. Up until 2018, ideas that challenged the state and its approaches were not welcome, and politicians, academics and journalists were jailed for expressing alternative views.

However, this appears to have changed, and in June 2018 the Deputy Prime Minister called for debate on the developmental state model. This article explores Ethiopia's developmental state model using the building stability framework, analyzing its ability to establish fair power structures, foster inclusive economic growth, develop conflict-resolution mechanisms, create effective and legitimate institutions, and enable a supportive regional environment. We find the developmental state was effective in a number of ways, but that this modality of governance appears to have passed its peak of securing advantage in Ethiopia. A shift from the developmental

state to developmental democracy appears to be underway. Decision-making and economic policies need to align with this change.

Keywords: Building stability framework, Developmental state, Ethiopia, Inequality

Dejene Lema, M., & Matewos Karo, T. (2019). Channels introducing life impacting small technologies for women in SNNPR: where are the media? *Inter Disciplina*, 7(17), 69–86.

Abstract: This study was conducted in Southern Ethiopia to assess how life impacting technologies are transferred to women, what factors affect the transfer, and to find out the role of media in the process. The study employed household survey data collected from 11,476 households all over the region. The study adopted a women empowerment index and Roger's (1983, 2003) diffusion of innovations model. According to the findings, various factors are in play, and interpersonal and mediated channels are found to be important in transferring vital technology to women, albeit the role of the media is in short due to high women illiteracy. The media, however, need to strive to improve their contribution by creating culturally compatible programs using local radio stations that broadcast programs in respective local languages.

Keywords: Media, Life impacting technologies, Women, SNNPRS.

Fjeld, R. E. V., Kristiansen, E., Rathje, M., Oskarsson, V., Konstaninovskaia, N., Gill, I., & Menuta, F. (2019). The worldwide use and meaning of the f-word. *Intercultural Pragmatics*, *16*(1), 85–111.

Abstract

This article documents the increasing use of the English curse word *fuck* worldwide, as well as its degree of adaption into the host language, its syntactic function, and its meaning and its strength as taboo. Comparing the use of *fuck* with a special focus on the Nordic countries (*Norway, Denmark*, and *Iceland*) with its use in Eurasia and Africa (with different alphabets, namely Cyrillic in *Russia*, Devanāgarī in *India* and Ge'ez script in *Ethiopia*), we found some similar

developmental patterns, but also differences, for example to what degree the English loan word has replaced local curses and in what ways among social groups within a country. Comparing the terms used for the same concept was challenging because some countries have better text corpora and more research on written languages and especially on taboos, and those without such resources required additional minor investigations for a baseline. Findings revealed that *fuck* has spread worldwide from English, and it is commonly used in Nordic languages today. In Russian *fuck* is also adopted into the heritage language to a relatively high degree, and it has further gained importance in the vocabulary of India, where English has become the most used language by the higher and middle classes, but less so by lower classes. In contrast, the study of Amharic language in Ethiopia shows that the *f*-word is rarely used at all, and only by youngsters. We found a pattern starting from the outer North with Icelandic having adapted and adopted the word *fuck* the most, a slight decline in use in Norwegian and Danish, with less adaption and use in Russian, even less in Indian-English or Hindi, and being more or less absent in the African language Amharic. Formally though it is used conceptually both in Hindi and Amharic.

Keywords: Globalization; Cursing; Swearing; Norwegian; Danish; Icelandic; Russian; Hindi; A mharic

Mohamed, A., Worku, H., & Kindu, M. (2019). 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*, 1–12.

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 planning and management schemes must emphasize on the level of patch fragmentation and 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.

College of Law and Governance

Behailu, D. (2019). Medemer in a Land of Extremes-Ethiopia. *HeinOnline, Hawassa UJL, Volume 3, Pages 217*

Introduction

Premier Abiy Ahmed of Ethiopia has written a book in Amharic entitled 'medemer' meaning synergy. I had established some of the opinions included in this review before the publication of the book as the idea was floating long before the publication of the book. However, the publication of the book forced me to review some of my earlier perceptions in light of the contents of the book. The book has sixteen chapters and touches upon practically everything there is to talk about Ethiopian politics, economics and societal fabrics. It elucidates the nature of 'medemer' philosophy and its hurdles. The book starts with a confession of the author's humble beginnings and his evolutionary route to the nation of medemer. The author admits that the concept is not a flash of genius rather has developed overtime as age and experiences increase. He has proposed the philosophy as a solution and practical guide to developing a shared understanding on wide-array of issues such as history, culture, tolerance, and economics. He aspires to abate extremism in Ethiopia via this philosophy called *Medemer*.

Huge that the nation is always at war with itself. Ethiopian elites are dividing along ethnic line, occasionally across religious orientations, on perceptions of history, on group identity and most importantly, on political views. Tolerance and inclusive politics is not their virtue. The current political leaders; however, are trying mend the broken politics. The new premier of Ethiopia, Abiy Ahmed, came up with the Amharic catchword "*medemer*" which means synergy, or to be included or to be together, or to be summed up towards collective greatness. The notion is highly relevant at this juncture of Ethiopian political, social and economic development. Why notion is a buzzword (labeled as a philosophy in the book written by the Prime Minister) of the day is questioned by everyone. Obviously, the notion has attracted a huge attention in Ethiopia and abroad. In a nation seemingly at war with itself, the notion is seen as a salvation from the deepening ethno linguistic divides and ensuing turbulences. The problem of 'othering' i.e., you do not belong her has become quite common place, annoying and disturbing many and even costing lives and

property of citizens. Ethnic based eviction (internal displacement) is a routine news and Ethiopia is number one in the world with many people (close to three million at one peak monument) internally displaced.

Mohammed, A. F., & Belay, D. G. (2019). Challenges of Evening Educational Program for Working Children and Young People: Evidence from Hawassa City, Ethiopia. *International Journal of Adult Vocational Education and Technology (IJAVET)*, *10*(4), 41–54.

Abstract

This article reports the findings from a study aimed at assessing the challenges of evening educational programs for working children and young people. A descriptive research design and mixed research approach were employed. The design helped to obtain information concerning the current status of the phenomena and to describe "what exists" with respect to conditions in a situation. A total of 367 students participated in the study. The findings of the study revealed that majority of the evening students are females. There are ongoing access issues for disadvantaged children and young people who cannot attend school on a regular basis, despite the provision of evening educational programs. Challenges include deficits in policy framework and the adopted curriculum, political drivers, teacher motivation, and facilities. Due to a lack of time, some courses are excluded from the evening programs. As a result, children and young people who are enrolled in this program achieve low academic performance as compared to the students in the regular program.

Mohammed, A. F., & Wobe, M. H. (2019). Factors Affecting Loan Repayment Performance of Microfinance Institution Borrowers: The Case of Omo Microfinance at Wondo Genet Woreda, Ethiopia. *International Journal of Applied Behavioral Economics (IJABE)*, 8(2), 27– 43.

Abstract

This study investigated the factors that affect the loan repayment performance of Omo Microfinance Institution borrowers at Wondo Genet Woreda, Ethiopia. Both primary and secondary data were used in the study. The required data were collected from 225 borrowers of Omo Microfinance. Respondents were selected by a stratified random sampling technique. Both

qualitative and quantitative methods of analysis were used. The findings of the study revealed that 44.9% of borrowers in the study area did not repay the amount of money they borrowed as per credit schedules. The major factors that affect the loan repayment performance of borrowers were their sex, educational level, family size, borrowing experience, timelines of loan, repayment period and advisory visit.

Der Beken, C., & Dessalegn, B. (2019). Urban Government Autonomy and Good Governance in Ethiopia: The Case of Hawassa City. *Ethiopian Journal of Federal Studies*. 162-187

Abstract

This article investigates the structure and practical operation of Hawassa City's government institutions using universally accepted yardsticks of good governance as an analytical framework. The analysis of the relevant regional laws has been complemented by fieldwork conducted in the city. The research reveals that Hawassa City has been legally endowed with important powers and responsibilities, the autonomous exercise of which, guided by the principles of good governance, should bring about all-round societal development. Yet the research also finds that the quality of governance in the city is negatively affected by a number of factors, one of which is the dominance of the Sidama people in city government institutions. Another important factor is the lack of effective mechanisms of checks and balances, both at horizontal (intra-city) and vertical (city-regional government) level. The research finds that inadequacies in the legal framework, along with aspects of the city's political context, have contributed to this situation. Hence, the study's main recommendations highlight the need for better management of the city's ethnic diversity as well as for strengthening and clarifying horizontal and vertical mechanisms of checks and balance.

Dessalegn, B., & Afesha, N. (2019). The Quest for Identity and Self-Determination in the SNNP Region of Ethiopia. *African Journals Online*, *13*(1).

Abstract

The rich ethnic diversity in the SNNP region is being managed by different mechanisms of constitutional, institutional, and political practice. Yet, this has not been able to contain new questions of identity, not only seeking for recognition as a distinct ethnic group, but also a desire

to establish ethnic territorial administrations. Moreover, ethnic groups that are already recognized are also laying claims to various self-determination rights, *inter alia*, to territorial autonomy, equitable participation, and the redrawing of internal (ethnic) boundaries. Based on legal analysis of cases from the SNNP region, the article critically discusses the quest for identity and selfdetermination, and provides an overview of the experience of the region. In dealing with the existing dilemma, we argue that there is a need to maintain the balance between constitutional rights to identity recognition and self-determination with the threat of ethnic and territorial fragmentations.

Key terms: Identity · Self-determination · Federalism · Ethnic groups · SNNP region

Dessalegn, B. (2019). Experimenting with Non-Territorial Autonomy: Indigenous Councils in Ethiopia. *JEMIE*, *18*, 3-23.

Abstract

After daringly adopting federalism based on ethnicity, Ethiopia has, since 1991, been empowering minority communities within ethnically designated territories. With the clear advantages of territorial solutions, the management of extreme ethnic pluralities through territorial approaches alone has proved a daunting task. Complementing territorial autonomy, the region of Benishangul Gumuz has opted to inculcate elements of non-territorial features in order to manage its regional diversity. This paper investigates the pros and cons of these measures and what it means for a federal arrangement that heavily relies on the matching of ethnicity with territory. It concludes that, even though non-territorial measures being undertaken are steps in the right direction, their full-fledged implementation has severely been curtailed by legal inadequacies and the political practice.

Keywords: Non-territorial autonomy, Territorial Autonomy, Ethno-national federalism, Indigenous councils, Minorities.

Dessalegn, B., & Fessha, Y. (2019). *Mobility and ethnic federalism in Ethiopia*. Addis Ababa University.

Abstract

Ethiopia's federal dispensation, ushered under the 1995 Constitution, guarantees ethnic groups – constitutionally termed as "nations, nationalities and peoples" – a wide array of self-rule rights. The Constitution also provides for a number of individual rights, including the free movement of citizens within the country. In a federal setup where subnational and local boundaries are constructed along ethno-linguistic lines, the mobility of individuals presents both opportunities and challenges. While the free movement of citizens provides unique opportunities including fighting stereotypes, facilitating inter-cultural exchange, and reinforcing cultural bonds, it has also the potential to create tension with members of the host community that perceive mobility of individuals as a threat against their constitutionally recognized self-rule rights. This paper examines how the Ethiopian federal setup, without adequate legal framework, is struggling to address these competing demands and, as a result, has probably undermined both citizenship and ethnic rights.

Institute of Technology (IOT)

Dawit, M., Halefom, A., Teshome, A., Sisay, E., Shewayirga, B., & Dananto, M. (2019). Changes and variability of precipitation and temperature in the Guna Tana watershed, Upper Blue Nile Basin, Ethiopia. *Modeling Earth Systems and Environment*, 5(4), 1395–1404.

Abstract

This paper studied the spatial and temporal variability of the statistical structures of precipitation Guna Tana watershed, Upper Blue Nile, Ethiopia, by analyzing the time series of temperature and precipitation from six weather stations during the period from 1990 to 2016. Inverse distance weight, precipitation concentration index and MK test statics were used to detect annual and seasonal precipitation concentrations and the associated spatial patterns. The results show that precipitation concentration index values were mainly observed in Guna Tana watershed in which about 83.33% and 16.67% were the uniform concentration of precipitation and strong irregularity of precipitation distribution was observed in the kiremt seasons' rainfall. The demonstration using Mann-Kendall trend test depicted that most parts of Guna Tana watershed are characterized by variability of precipitation and temperature. The results reveal that significant trends in adverage rainfall were observed (both positive and negative trends). Those significantly decreasing trends of average monsoon rainfall have the highest value of decreasing slope (i.e., -1.88 mm/year) for Luwaye station and percentage change of -31.07% in Bega season. Decreasing slopes (-0.14 °C/year) and percentage change (-22.79%) were observed in Luwaye station at the average annual minimum temperature and increasing Sen's slope temperature recorded at 24.64 °C/year and percentage changes at 0.136% in 10% level of significance at Woreta station in average annual minimum temperature.

Mathewos, M., Dananto, M., Erkossa, T., & Mulugeta, G. (2019). Land use land cover dynamics at Bilate Alaba sub-watershed, southern Ethiopia. *Journal of Applied Sciences and Environmental Management*, 23(8), 1521–1528.

Abstract

This study was intended to detect land use/land cover changes over 44 years in the Bilate Alaba Subwatersed, Southern Ethiopia. Four Landsat images (1972, 1986, 2008 and 2017) were used to as inputs to produce four land cover maps of the subwatershed; ERDAS imagine and ArcGIS software were utilized to accomplish the analysis. In the period between 1972 to1986 cultivated and settlement showed an incremental change by 280.91 and 71.43 ha respectively, while bare land and shrub & grass land decreased by 225.26 and 140.25 ha respectively. In the period 1986 to 2008 cultivated and bare land increased by 105.13 and 52.90 ha while forest and shrub & grass land decreased by 103.41 and 50.84 ha respectively. Between 2008 and 2017 settlement and bare land increased by 83.20 and 65.54 ha respectively while shrub & grass land and forest land decreased by 112.59 and 46.16 ha respectively. The results showed that cultivated land and settlement land expanded by 67.38% and 532% respectively whereas forest land, shrub land & grass land declined by 66.35%, 18.36% respectively over the analysis period (1972-2017). There should be appropriate rural land use/management policy by identifying proper land for specific purpose so that degraded lands would not put under cultivation.

Keywords: Land use, Land cover, GIS, Landsat

Alemayehu Muluneh & Saskia Deborah Keesstra (2019). Increasing Maize Yield through Crop Intensification in the Central Rift Valley of Ethiopia

Abstract

Maize yield in the Central Rift Valley of Ethiopia (CRV) suffers from dry spells at sensitive growth stages. We tested the hypothesis that crop intensification through supplemental irrigation (SI) from Rain Water Harvesting (RWH) systems and a higher plant density of a hybrid variety under increased fertilization might bridge dry spells, reduce risk of crop failure and increase yield. First,

we estimated the availability of sufficient runoff in dry years for water harvesting. The long term dry spell analysis was carried out using long term (1970-2009) daily rainfall data. During 2012 (dry) and 2013 (wet) on-farm field research was conducted with 10 combinations of supplemental irrigation and plant density. The simplest was rainfed farming with 30,000 plants ha-1. The most advanced was no water stress and 75,000 plants ha-1. We compared our on-farm yield with that of neighbouring farmers. The 42 years (1970-2011) daily rainfall analysis proves the occurrence of long dry spells (>10 days) during the Belg season. The result showed that despite significant maize yield difference between rainfed and SI, it is not worth the effort to use SI during non-critical drought years since it is not financially feasible. There was a significant yield increase as we increased plant density from 30,000 plants ha-1 to 75,000 plants ha-1. The 2012 & 2013 average grain yield difference between farmers practice and on-farm research was 81%. This yield difference is attributed to the difference in fertilizer use. The food security of smallholder farmers in sub-Saharan Africa is largely constrained by water availability. However, in many sub-Saharan African countries there is sufficient average rainfall over the crop season to obtain good yields, but yields are greatly reduced by periods of > 10 consecutive dry days at critical growth stages of the crop. Water stress at flowering stage of maize, for example, reduces yields by 60%, even if water is adequate throughout the crop season (Seckler & Amarasinghe, 2000). Therefore, the key challenge is to reduce water shortage-related risks posed by high rainfall variability rather than coping with an absolute lack of water.

Smith, J., Nayak, D., Albanito, F., Balana, B., Black, H., Boke, S., Brand, A., Byg, A., Dinato, M., & Habte, M. (2019). Treatment of organic resources before soil incorporation in semiarid regions improves resilience to El Niño, and increases crop production and economic returns. *Environmental Research Letters*, *14*(8), 085004.

Abstract

The use of limited organic resources to build resilience to drought in semi-arid regions was investigated using systems modelling. The study focused on Halaba in Ethiopia, drawing on biophysical and socio-economic data obtained from a survey of farms before, during and after the 2015/16 El Niño event. Using a simplified weather dataset to remove noise from weather
fluctuations, a ten yearly El Niño was demonstrated to cause significant long-term degradation of soil, reducing crop yields by 9%-14% and soil carbon by 0.5%-4.1%; more frequent droughts would increase this impact. Farmers in Halaba usually apply manures to soils untreated. Counteracting the impact of El Niño on soil degradation is possible by increasing application of untreated manure, but would result in a small net cost due to loss of dung as fuel. By composting manure its recalcitrance increases, allowing soil degradation to be counteracted without cost. The best option investigated, in terms of both food and fuel security, for households with access to water and finances needed for anaerobic digestion (500–2000 US\$), is to use manure to produce biogas and then apply the nutrient-rich bioslurry residue to the soil. This will result in a significant benefit of over 5000 US\$ per decade from increased crop production and saved fuel costs. However, many households are limited in water and finances; in that situation, the much cheaper pyrolysis cook-stove (50 US\$) can provide similar economic benefits without the need for water. The biochar residue from pyrolysis is highly recalcitrant, but pyrolysis results in loss of nutrients, so may result in lower yields than other uses of manures. This may be countered by using biochar to capture nutrients from elsewhere in the farm, such as from animal housing or compost pits; more work is needed to quantify the impact of treated biochar on crop yields.

Dagnachew, M., Moges, A., & Kassa, A. K. (2019). Effects of land uses on soil quality indicators: The case of Geshy subcatchment, Gojeb River Catchment, Ethiopia. *Applied and Environmental Soil Science*, 2019.

Abstract

Land degradation caused by improper land use management is a critical worldwide problem that has revived the issue of resources sustainability. Soil degradation, which involves physical, chemical, and biological degradation, is the key component of land degradation. Assessment of soil quality (SQ) indicators that distinguish soil degradation in different land use (LU) types is enviable to achieve sustainable land management strategies. The objective of this study was to assess the effects of land uses on soil quality indicators in the Geshy subcatchment of the Gojeb River Catchment, Omo-Gibe Basin, Ethiopia. The LU types identified for evaluation included natural forest, cultivation, and grazing lands. Accordingly, a total of 54 soil samples (three LU types × three slope classes (blocks) × three replications × two soil depths) were collected with an "X" plot design for data analysis. Statistical differences in SQ indicators were analyzed among LU types, slope classes, and soil depths and tested using univariate analysis of variance and Pearson's correlation coefficient, following the general linear model. The results showed that a number of SQ indicators were significantly influenced by LU changes and soil depths. The sand, dry soil bulk density , volumetric soil water contents (VSWC), total porosity, water infiltration rates, cumulative infiltration, and total nitrogen showed significant variations between the natural forest and the other LU types and soil depths (). However, silt, clay, soil pH, SOC contents, carbon-to-nitrogen ratio, and available phosphorus did not show significant variations between LU types and soil depths (). The overall qualities of the soils under the cultivation land were inferior in VSWC, TP, water infiltration rates, SOC contents, and TN soil attributes of the adjacent natural forest and grazing lands. The studied soils were found to be dominantly of clays with slightly acidic and low SOC contents and slow in their infiltration rate. Thus, integrated and sustainable land management, aimed at enhancing proper LU systems, is crucial for the sustainable ecosystem functioning and is the most effective way in reversing of soil quality deterioration.

Whitfield, S., Beauchamp, E., Boyd, D. S., Burslem, D., Byg, A., Colledge, F., Cutler, M. E., Didena, M., Dougill, A., & Foody, G. (2019). Exploring temporality in socio-ecological resilience through experiences of the 2015–16 El Niño across the Tropics. *Global Environmental Change*, 55, 1–14.

Abstract

In a context of both long-term climatic changes and short-term climatic shocks, temporal dynamics profoundly influence ecosystems and societies. In low-income contexts in the Tropics, where both exposure and vulnerability to climatic fluctuations is high, the frequency, duration, and trends in these fluctuations are important determinants of socio-ecological resilience. In this paper, the dynamics of six diverse socio-ecological systems (SES) across the Tropics – ranging from agricultural and horticultural systems in Africa and Oceania to managed forests in South East Asia and coastal systems in South America – are examined in relation to the 2015–16 El Niño, and the

longer context of climatic variability in which this short-term 'event' occurred. In each case, details of the socio-ecological characteristics of the systems and the climate phenomena experienced during the El Niño event are described and reflections on the observed impacts of, and responses to it are presented. Drawing on these cases, we argue that SES resilience (or lack of) is, in part, a product of both long-term historical trends, as well as short-term shocks within this history. Political and economic lock-ins and dependencies, and the memory and social learning that originates from past experience, all contribute to contemporary system resilience. We propose that the experiences of climate shocks can provide a window of insight into future ecosystem responses and, when combined with historical perspectives and learning from multiple contexts and cases, can be an important foundation for efforts to build appropriate long-term resilience strategies to mediate impacts of changing and uncertain climates.

Keywords: Climate change; Variability; Temporal dynamics; Resistance; Perturbations; Societies; Ecosystems

Tekleab, S., & Kassew, A. (2019). Hydrologic responses to land use/Land cover change in the Kesem Watershed, Awash basin, Ethiopia. *Journal of Spatial Hydrology*, *15*(1).

Abstract

The main objective of this study was to investigate the impacts of land use/Land cover change impacts on streamflow availability in The Kesem Watershed, Awash basin, Ethiopia. Two methodological approaches were employed to achieve the objective. The Soil and Water Assessment Tool (SWAT) model was used to quantify the changes using two time period land use maps. Moreover, Mann-Kendall (MK) statistical test was used to detect the monotonic trends if exists in the time series of the measured and simulated streamflow. Land use change detection was done using remote sensing techniques and the maps were processed using ERDAS Imagine 2014 and ArcGIS10.1 software. From the land cover change analysis results it was found that there has been a substantial decline of forest lands, shrub lands, grass lands and drastic expansion of agricultural land. The SWAT modeling results showed that an increase of streamflow by 23.2% comparing the two land use maps (1993 versus 2005). The analysis also revealed that flow during the wet months has increased by 36.4% while the flow during the dry season decreased by 33.6%. The investigation of the streamflow trends on the mean annual, seasonal, 1- and 7-days annual

minimum and maximum flows depict that in the case of 1-day maximum flow, no significant trend is noticeable; however, the extreme low flows indicators (e.g. 1D minimum, 7D minimum) and dry seasonal flows exhibited statistically significant decreasing trends (p =0.015, 0.0016 and 0.005) respectively. Overall, the combined results of the SWAT model and the statistical tests revealed that land use change has caused a significant increase on mean annual streamflow and decreasing dry season flows of the studied watershed during the last three decades. The identified result is important to manage the water resources in an optimal manner. Besides, planning of water resources development in the basin, should take into account land use change scenarios in order to bring sustainable development in the basin.

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Solomon, D., Kiflie, Z., & Van Hulle, S. (2019). Kinetic investigation and optimization of a sequencing batch reactor for the treatment of textile wastewater. *Nanotechnology for Environmental Engineering*, *4*(1), 15.

Abstract

Discharging of untreated or partially treated textile wastewater is common in Ethiopia, and this has detrimental effect to the environment. It is difficult to treat textile wastewater by conventional biological processes. In this study, real textile wastewater was taken and treated using sequencing batch reactor using a biomass taken from domestic wastewater treatment plant. Cycle period, air flowrate and sludge retention time (SRT) were initially optimized using the response surface methodology. The optimum ratio of cycle period/air flowrate/SRT which gives a 57% COD removal and 54% color removal was found to be 25 h/15 L/h/16 day. Using two types of wastewater substrate concentrations and various hydraulic retention times at optimized condition, COD removal, color removal, sludge volume index (SVI) and mixed liquor suspended solid were measured. The maximum of COD removal (73%) and color removal (65.8%) was obtained at an organic loading rate of 0.078 kg COD/m³ day. SVI at the optimized condition was found to be 90–

92 mL/g. Finally, a first-order kinetic model was used to represent the degradation of textile wastewater.

Kasie, F. M., & Bright, G. (2019). Integrating fuzzy case-based reasoning and discrete-event simulation to develop a decision support system for part-fixture assignment and fixture flow control. *Journal of Modelling in Management*.

Abstract

Purpose This study aims to propose a decision support system (DSS) that performs a decisionbased part-fixture assignment and fixture flow control in planned production periods. Design/methodology/approach The principal approaches were fuzzy case-based reasoning (FCBR) and discrete-event simulation (DES). Besides, the fuzzy analytic hierarchy process (FAHP), an object-oriented (OO) method and a fuzzy weighted Euclidean distance were used to support the decision-making process. Findings It shows that integrating FCBR and DES systems is a promising approach to address part-fixture planning problems. The FCBR subsystem proposed various stable numbers of fixtures as scenarios. The DES model analyzed the future performances of these scenarios and identified the best alternative. Research limitations/implications The DSS was tested in laboratory environments using a numerical analysis; however, it was not validated in industrial situations. Originality/value The synergy of integrating FCBR and DES systems was not exploited in the past in part-fixture assignment and fixture flow control problems.

Kidane, H, Rao, S., & Gebremariam, K. (2019). Preliminary Urban Area Wind Resource Assessment and Wind Speed Data Analysis. *Innov Ener Res*, 8(232), 1-9.

Abstract

Recently society of world is more interested in using pollution free sources of energy. Wind energy is among the renewable energy which is the most valuable and promising choice because it is abundant, renewable, environmentally friendly. Accessing characterizing and knowing the probability of the wind resource are the main aim of this work. The paper was started by selecting appropriate site; thus, the target area was Mekelle University. A secondary data collection method was used to carry out the study. Direct and indirect methods was used to analyses the collected

data then extrapolated to the proposed hub height using power law. Weibull probability density function used to forecast the wind resource. From the analysis presented Winter was the windy season in both years and the annual mean wind speeds for the years 2010 and 2012 were 3.67 m/s and 3.57 m/s at height of 10 m and 4.69 m/s and 4.59 m/s at 26 m respectively. The dominant prevailing wind direction was east.

Chandrasekar, M., Zewdie, M., & Nigussie, T. (2019). Engineered practices of adobe masonry production in Ziway, Ethiopia. *Zede Journal*, *37*(1), 13–25.

Abstract

A non-engineered production practice of adobe-blocks prevails in southern Ethiopia around Ziway, which are used for rural housing. These blocks have a compressive strength of less than 1 MPa and exhibit deformed shape due to excess water and non-uniform distribution of teff straw during mixing. The objective of this research was to advocate a better practice to enhance the strength of adobe masonry unit. Tests were conducted on the soil samples for its suitability to produce adobe masonry units. Pumice aggregate and teff straw were used as additives. Compressive and flexural strength values observed for brick size specimens with 9% of pumice aggregate and 0.4% of teff straw content were 2.6MPa and 0.36MPa respectively. These values have passed the minimum requirement of California Building Code which is considered as standard for the present research. Whereas block size specimens showed compressive strength values less than the minimum requirement. Hence brick size was recommended to use in practice, over block size. Unit cost was considered affordable as the cost of pumice and teff straw used per unit was extremely low in value. Also around 60% cost reduction was observed when adobe units were used instead of Hollow Concrete Blocks for masonry construction.

Keywords: Adobe block, Adobe brick, Masonry unit, Pumice aggregate, Teff Straw

Chaka, D. S., & Oda, T. K. (2019). Understanding land surface temperature on rift areas to examine the spatial variation of urban heat island: The case of Hawassa, southern Ethiopia. *GeoJournal*, 1–22.

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.

Kidane, Halefom, Fisha, B., Asmelash, H., & Tafesse, D. (2019). Recoverable Quantity of Waste Heat from Kiln and Preheater Systems and Economic Analysis (Case of Messebo Cement Factory). *Journal of Energy Technologies and Policy*, 9(9), 29–41.

Abstract

This project entitled "Recoverable quantity of waste heat at Messebo cement factor y" has tried to quantify the amount of heat loss, the amount of energy and cost saved from the waste heat. Here both primary and secondary data collection methods were included to carry out the study. So, the projects present starts by identifying the main source of waste (which part of cement have high loss), following calculated heat lost from the identified places or machines and final calculating the possible money saved if the waste heat changed to use full form or if it recovered Successful recovery waste heat contributes to lower fuel cost, lower electricity consumption. Kiln surface zones, Preheater cyclone 4 and 5 are the main areas in which high waste was occur. From Kiln surface zones (959.13 kJ), Preheater cyclone 4 and 5(587.199 kJ) amount of heat is lost. From this lost we can recover around 62 kW power is recovered, 44155kwhr/month energy and 26492birr/month could be saved. It recommended the energy management department should invite and support others participation and to study on the heat recovery from the loosing of energy and to study on the alternative energy sources of the company.

Keywords: Waste heat, Waste heat recovery system, Preheater, Kiln, energy,

Sivaraj, M., Rajkumar, S., Rudrapati, R., & Muthuraman, S. (2019). Characterization and Mechanical Behavior of Sintered Al-Mg Powders. *Trends in Machine Design*, 6(1), 1–7.

Abstract

The resolution of the work is to relate the characterization and mechanical properties for argon atomized Al-1wt%Mg powders through and not through lubricant 1 wt% graphite. Pure nitrogen sintering was accomplished and the effect of sintering atmosphere for the mixed Al1%Mg powder compacts was examined. One weight percent graphite was premixed with the powder as a lubricant for the first set samples. However, no graphite was used for the second set specimens. As a sintering aid, 1wt% Mg was enhanced for both group materials. Compaction of the specimens was

achieved using a hand operated hydraulic press and a floating rectangular die. First set specimens were pressed to green densities of 92.5 and 93.5% by pressures of 440 and 495 MPa, respectively. In the second set (no graphite) samples, 94% green density was achieved using the similar compaction pressures. Sintering and de-lubrication ensured in a horizontal tube furnace with a high purity nitrogen atmosphere. Green & theoretical density increased with the increment of compaction pressure. Residual macro & micro porosity was present in all sintered samples under every sintering condition. Average sized pores and small interrelated micro-pores at grain boundaries were observable when lubricant was enhanced which reduced the sintered densities due to a wide burn off range leaving residual porosity.

Keywords: Sintering, Al-Mg powders, Mechanical properties, Densities.

Periasamy, K., Jayaraman, M., & Rajkumar, S. (2019). Mechanical properties of 7075-t6 aluminium alloy surface hybrid composites synthesised by friction stir processing. *International Journal of Rapid Manufacturing*, 8(1–2), 52–64.

Abstract

In this investigation of surface hybrid composites on aluminium alloy 7075 substrate using friction stir processing (FSP) with various composition of reinforced particles such as silicon carbide (SiC) and graphite (Gr). The distribution of reinforcement in the nugget zone was examined by SEM with EDS analysis. The strength and microhardness are compared with the samples. Sample S3 (50% SiC + 50% Gr) shows the property superior than other combinations. The samples with higher amount of graphite content leads to deterioration in tensile strength and hardness.

Keywords: Aluminium alloy, Reinforcement particles, Surface modification, Friction stir process, FSP, Hybrid composites

Kanchana, S., Patchainayagi, S., & Rajkumar, S. (2019). Empowering students to become effective learners through activity based learning. *Humanities & Social Sciences Reviews*, 7, 5, 57–62., *Date 2019*

Abstract

Purpose of the study: Activity based learning helps students to learn actively in classroom and it also provides ample scope for experimental learning. Students are to be provided opportunities and optimum learning environment to explore their knowledge and skills. It would broaden the understanding of concepts and theories in their core premises. It enhances the learning process and the students as active learners. Methodology: Interactive learning strategies are categorized as individual learning and group learning strategies. Individual activities may include flipped learning, polling answers and questions. Group activities include pair and share strategy, inspire and initiate scenarios. Main Findings: Interactive learning strategies, E-Learning and M-Learning are preferred modes for the students, promotes the cognitive level of the learners, achieved learning objectives. It is essential to suggest and design innovative learning practices. Implications: Higher education institutions and even schools are using various enhanced interactive learning practices, educational apps and M-Learning techniques. These activities enhance the student engagement in the classroom. By implementing activity based learning practices, learners become investigators and strive to make best real time decisions for different scenarios. Novelty/Originality of this study: Enhanced learning strategies promotes cooperative learning and efficient for large group of learners.

Keywords: Activity based learning, Empowering students, Active learners, Flipped learning, Innovative learning practices, M-Learning.

John, A., Johny, K. J., Arulmurugan, B., Rajkumar, S., Arivazhagan, N., Naiju, C. D., & Manikandan, M. (2019). Investigation on Microstructure and Mechanical Properties of Corrosion Resistance Alloy C-2000 Fabricated by Conventional Arc Welding Technique (No. 0148–7191). SAE Technical Paper.

Abstract

In the current work the metallurgical and tensile properties of the weld joints of alloy C-2000 were investigated. Welding technique employed in this study is Tungsten Inert Gas Welding (TIG) and Pulsed Current Tungsten Inert Gas (PC-TIG) welding with autogenous mode and Ni-Cr-Mo rich ERNiCrMo-10 filler wire. The results show that PC-TIG weldment obtained the refined microstructure compared to the TIG weldment. Energy dispersive spectroscopy (EDS) showed the extent of Cr segregation was observed in all the weldments. PC-TIG welding shows reduced segregation compared to the corresponding TIG. X-ray diffraction (XRD) corroborated the existence of Ni₃Cr₂ phases in the weld fusion zone. Tensile test results show the PC-TIG weldment. The strength of the weldments is inferior in all cases in comparison to base metal.

Prema, C. E., Suresh, S., Ramanan, G., & Sivaraj, M. (2019). Characterization, corrosion and failure strength analysis of Al7075 influenced with B4C and Nano-Al2O3 composite using online acoustic emission. *Materials Research Express, Volume 7, Issue, Pages 1-17*

Abstract

This paper aims to establish the mechanical, corrosion and failure analysis using online acoustic emission of Al7075 alloy, Al7075-B₄C composite and Al7075-B₄C-Al₂O₃ hybrid composite with different Boron Carbide (B₄C) content of 5, 10, 15 &20% and Nano Aluminum Oxide (Al₂O₃) content of 2% on a weight basis with the high energy stir casting methods. The casted samples have been characterized by x-ray Diffraction (XRD), Thermo gravimetric analysis (TGA/DSC), Energy Dispersive Spectrum (EDS), and Scanning Electron microscope (SEM). In case of hybrid composite, the hardness and the tensile strength decrease when the content of Al₂O₃ increases. However, in the present research, the addition of B₄C with nano Al₂O₃ particles in certain proportions has increased the hardness and tensile strength. In addition, the tensile fractography of

the specimens were analysed using SEM. Acoustic Emission (AE) method was used for monitoring the acoustic energy that are released at the time of deformation process and early crack detection. The influence of the volume fraction of the B₄C particulates on the microstructural and corrosion characteristics of Al7075-B₄C with nano Al₂O₃ metal matrix composite (MMCs) was also studied. It has been observed from the literature that the direct strengthening of composites occurs due to the presence of hard ceramic phase, while the indirect strengthening arises from the thermal mismatch between the matrix alloy and reinforcing phase during solidification. Based on the database for material properties, the application area of HAMCs has been proposed in the present review. The effects of nanomaterial dispersion in the metal matrix and the formation of interfacial precipitates on these property relationships of such novel Nano composites.

Molla, T., Khan, B., Moges, B., Alhelou, H. H., Zamani, R., & Siano, P. (2019). Integrated optimization of smart home appliances with cost-effective energy management

system. CSEE Journal of Power and Energy Systems, Volume 5, Issue 2, Pages 249–258, Date 2019

Abstract

Reliable electrical distribution system is the primary requirement of smart grid. Further, with the integration of intermittent renewable energy sources (RESs), reliability assessment is very vital. Various deterministic and probabilistic methods are utilized to assess the reliability of distribution system. This review study about distribution system reliability assessment (DSRA) with renewable energy sources (micro grid, distributed generation, solar and winds) and without renewable energy resource. For that purpose DSRA methods such as Monte Carlo simulations (MCS) and other DSRA methods are discussed. The distribution system reliability is considering using the renewable energy. The stochastic features of the parameters the most designing method depend on MCS. These techniques are utilized to provide reliability assessment of small size system due to the computational costs associated with them. That is restricted a number of lumped equipment for a given renewable energy like solar and winds. Numerous states are used to describe the arbitrariness in the generation of renewable units, because of the stochastic behavior of the generation system.

College of Natural and Computational Science (CNCS)

Bekele, B., Workagegn, K., & Natarajan, P. (2019). Prevalence and Antimicrobial Susceptibility of Pathogenic Bacteria in Nile Tilapia, Oreochromis niloticus L. *International Journal of Aquaculture and Fisher Sciences*.

Abstract

Nile tilapia, Oreochromis niloticus, is one of the most popular aquaculture fish species in the world. However, among several challenges, the presence of pathogenic bacteria causes high economic losses. Thus, the main objective of this study was to isolate and identify the potent bacterial pathogens from Nile tilapia reared at Hawassa Fish Research and Multiplication Station, Ethiopia. For this, infected fish samples were collected from the research station and subjected to microbiological and biochemical tests. The results of the study revealed that 75% of fish with the length group ranged from 14-17.9cm; 52% with the length group ranged from 18-21.9 cm and 33% with the length group ranged from 22-26.9cm were infected by different bacteria belonging Escherichia. to the genera Vibrio, Aeromonas. Pseudomonas. Salmonella and Streptococcus. Except for Streptococcus, all isolates belonged to gram negative bacteria. The bacterial population observed in fish organs was significantly high in intestine (12.43±0.55 Log10 CFU-1g) than in liver (6.48±1.06 Log10 CFU-1g). An antibiogram test showed that isolated bacteria were sensitive to gentamycin, tetracycline and amoxicillin. In conclusion, the present results clearly indicate that cultivable fishes are prone to infection by infectious and non-infectious and that it may affect fish and their product quality which leads to economic loss and livelihood of farmers who depend on small scale aquaculture.

Keywords: prevalence, Antibiotic resistance; Pathogenic bacteria

Temam, A. G., & Lelisho, T. A. (2020). DFT study on coupling reaction of carbon dioxide with ethylene oxide catalyzed by 1, 4, 6-triaza-bicyclo [3.3. 0] oct-4-enium bromide (TBO. HBr). *Molecular Physics*, *118*(4), 1623931.

Abstract

Chemical fixation of CO₂ with epoxides catalyzed by organic-base salts were found to be efficient among the various catalysts tested due to synergetic effects of HBDs and halide-ions for ringopening. In this study, 1,4,6-Triaza–bicyclo[3.3.0]oct-4-enium bromide catalyzed conversion of CO₂ and epoxide into cyclic-carbonate has been studied by using DFT method to understand the reaction mechanism and the catalytic performance of TBO.HBr. Two hypothetical reaction mechanisms were proposed for the coupling reaction. Thermodynamic and kinetic parameters were computed for each steps to determine the more favorable route. Mechanism II is more favorable path whereby Br⁻ ion first interacts with epoxide to form bromo-alcohol, which directed to form carbonate-ion and finally ring-closure step yielded cyclic-carbonate with catalystregeneration. Cyclization step is rate-determining step with reaction barrier of 22.696 kcal/mol in gas phase. Ensuing the favorable mechanism II is still more favorable reaction path in both THF and water. However, the rate-determining step is found to be ring-opening of the epoxide with reaction barrier of 22.658 kcal/mol (wate) and 21.969 kcal/mol (THF). In this study, TBO.HBr exhibited good catalytic activity for the title reaction investigated in both gas phase and solvents.



Keywords: CO2, Chemical fixation, Cycloaddition, DFT, Expoxide, PCM and TBO

Khan, B., Alhelou, H. H., & Mebrahtu, F. (2019). A holistic analysis of distribution system reliability assessment methods with conventional and renewable energy sources. AIMS Energy, 7(4), 413–429.

Abstract: Reliable electrical distribution system is the primary requirement of smart grid. Further, with the integration of intermittent renewable energy sources (RESs), reliability assessment is very vital. Various deterministic and probabilistic methods are utilized to assess the reliability of distribution system. This review study is about distribution system reliability assessment (DSRA) with and without renewable energy generation technologies such as micro grid, distributed generation, solar and wind. For that purpose, DSRA methods such as Monte Carlo simulation (MCS) and other DSRA methods are discussed. The distribution system reliability is considered by using the renewable energy generation techniques. The stochastic features of the parameters in the designing process defined the type of MCS simulation technique. These techniques are utilized to provide reliability assessment of compact system due to huge computational time associated with them. It can be restricted by restricting number of lumped equipments for a given renewable energy source. Further, numerous states can also be used to describe the arbitrariness in the renewable energy generation, because of the stochastic behavior of the resources and the mechanical degradation of the system.

Keywords: Distribution system reliability assessment; Monte Carlo simulation; Micro-grid; solar energy; Wind energy

Haile, M., & Tsegaye, E. (2019). Analysis of Physico-chemical Characteristics of Water Collected from Different Sampling Sites of Lake Hawassa, Ethiopia. 9(2), 38–45.

Abstract

The research aimed to evaluate the current water quality status of Lake Hawassa in order to identify potential pollution sources, and put in place monitoring programs. Eleven potential sampling sites were included in the study. Water quality parameters, such as total dissolved solid (TDS), pH, temperature, conductivity, turbidity, dissolved oxygen (DO), five day biological oxygen demand (BOD5), total hardness as CaCO₃, total alkalinity as CaCO₃, nitrate, sulphate, orthophosphate,

fluoride, K, Mg, Cu, Cd, Cr, Fe, Mn, Pb, and Zn were determined and compared with WHO standards. The results were compared with the WHO and FAO standards. And the values of TDS (381.7 to 1286.0 mg/L), SC (733.7 to 2151.3 μ S/cm), turbidity (8.20 to 87.3 NTUs), BOD₅ (4.02 to 76.2 mg/L), phosphate (0.348 to 1.90 mg/L), fluoride (11.6 to 17.5 mg/L), chromium (0.173 to 0.665 mg /L), manganese (0.133 to 1.83 mg/L), and copper (1.40 L to 18.2 mg/L) were found above the prescribed limit of WHO guidelines for drinking purposes, while all the analysed water quality parameters were fall within the FAO standard limit for irrigation purposes. These suggested that both point and non-point pollution sources such as human sewage, industrial waste from ceramics, textile, plastics and food processing industries, urban stormwater, agricultural runoff and land development were impacting the lake. Thus, mitigation measures should be put in place to prevent the Lake from further deterioration.

Keywords: Water pollution, Water quality parameters, Toxic metals

Hone, F. G., & Abza, T. (2019). Short Review of Factors Affecting Chemical Bath Deposition Method for Metal Chalcogenide Thin Films. Publication: *Int. J. Thin. Fil. Sci. Tec.*, Volume 8, Issue 2, Pages 43–53.

Abstract: Thin film materials are important because of their potential low cost processing with minimal material usage while fulfilling application requirements. Thin films also enable applications where low weight and mechanical flexibility are decisive. A number of studies verified that their physical and chemical properties are highly dependable on the deposition methods. Thin films can be synthesized by varieties of physical and chemical deposition techniques. Among these techniques chemical bath deposition (CBD) is one of the most suitable routes to get uniform, well adherent and good reproducibility thin films. Moreover, currently it attracts considerable attention due to its low temperature compatibility, large area deposition with better homogeneity and cost effectiveness. But there are lots of factors affecting the deposition mechanism and the quality of the thin films. Hence, it is very helpful to know about these different factors which influence CBD method. The intention of this review paper is to present a screening of different works carried out so far to achieve a better understanding of the major factors affecting chemical bath deposition technique.

Keywords: Chemical bath deposition, Metal chalcognide thin films, Solubility Product, Semiconductor.

Melese, A., Dobo, B., & Mikru, A. (2019). Antibacterial activities of Calpurnia aurea and Ocimum lamiifolium extracts against selected gram positive and gram-negative bacteria. *Ethiopian Journal of Science and Technology, Volume 12, Issue 3, Pages 203–220., Date 2019*

Abstract

Indigenous knowledge, literature reports and ethnobotanical records suggest that plants are the basis for medicines. This study was designed to examine *in-vitro* antibacterial activity of Calpurnia aurea (leaf, bark) and Ocimum lamiifolium (leaf, flower) collected from Wonsho and Shebedino districts of Sidama Zone, southern Ethiopia, with different solvents against three Gram negative (Escherichia coli, Salmonella typhimurium and Pseudomonas aeruginosa) and one Gram positive (Staphylococcus aureus) bacteria in 2018. The leaf and bark of Calpurnia aurea and leaf and flower of Ocimum lamiifolium were dried, powdered and extracted with 80% acetone, ethanol, methanol and distilled water. Disc diffusion method was used for the antibacterial assay and measuring the zone of inhibition and minimum inhibition concentration (MIC) was determined by broth macrodilution method. The highest percentage yield of crude bioactive agents, i.e., 36.9% was obtained from Ocimum lamiifolium leaf with methanol as a solvent, while the lowest yield 12.6% was obtained from *Calpurnia aurea* bark with acetone extract. All crude extracts from the different plant parts showed antibacterial activity. Accordingly, Calpurnia aurea bark with methanol extract exhibited the highest antibacterial activity 22.64 ± 0.95 (mm) against S. *aureus* which was comparable to standard antibiotic disc Ciprofloxacin with inhibition zone of 24.00 ±0.19 (mm), while the lowest inhibition of 6.12±0.41 (mm) was recorded from Ocimum lamiifolium flower with water crude extract against P. aeruginosa. The MIC of 3.13mg/ml was observed from methanol crude extract of bark of *Calpurina aurea* on *S. aurea*. Crude bark extract of Methanol showed the highest antibacterial activity. The studies revealed that antibacterial activity of the crude extracts from the different parts of the plant were variable when extracted by different solvents, however, possesses good antimicrobial activity which support the traditional use of the plant in the treatment of bacterial infections under study. Finally, to support the

traditional users, scientific verification on phytochemical analysis and toxicity test should be carried out to confirm users' safety.

Keneni, Y., Hvoslef-Eide, A. T., & Marchetti, J. (2019). Mathematical modelling of the drying kinetics of Jatropha curcas L. seeds. *Industrial Crops and Products, Volume 132, Pages 12–20., Date 2019*

Abstract

Jatropha (Jatropha curcas L) seed contains non-edible oil, which is suitable for biodiesel production. The present research focused on the mathematical modelling of the drying kinetics of Jatropha seeds at a storage moisture content. The non-pretreated seeds (whole seeds) and pretreated seeds (crushed seeds) were dried at five different air temperatures (313, 323, 333, 343 and 353 K) in a standard heating furnace. The moisture loss from the seeds was systematically recorded, converted to moisture ratio, and fitted to four semi-theoretical drying mathematical models: Lewis, Henderson and Pabis, Page and Avhad and Marchetti models. The fitness of the models were compared using the coefficient of determination (\mathbb{R}^2), chi-square test (\mathbb{X}^2), root mean square error (R_{MSE}), mean bias error (MBE), and mean absolute error (MAE). It was found that an increase in the air temperature caused a reduction in the drying time of both the whole and crushed seeds. From the tested models, the Avhad and Marchetti model showed the best fitting to the experimental data with R² varied from 0.9914 to 0.9969 and 0.9908 to 0.9917 for all tested temperatures for the whole seeds and crushed sees of Jatropha, respectively. The Avhad and Marchetti mode showed superior fit to the experimental data at the drying temperature of 313 K with R² of 0.9969 for the whole seed, and at 333 K in case of crushed seeds for which the R² value was 0.9917. The activation energy values of 33.53 and 32.885 KJ mol⁻¹were obtained for the whole and crushed seeds, respectively when the best-fitted model was used.

Keneni, Y. G., & Marchetti, J. M. (2019). Temperature and pretreatment effects on the drying of different collections of Jatropha curcas L. seeds. *SN Applied Sciences*, *Springer*, *Volume 1, Issue 8, Pages 1-11, Date 2019*

Abstract

Drying oilseeds to reduce their moisture content is crucial in order to preserve the seeds and their contents. However, due to the nature of conventional storage facilities, it is ideal to dry seeds just before using them for oil extraction and/or in situ biodiesel production as the seeds dried in advance might recover the equilibrium moisture content due to the humidity from the air. Thus, drying the seeds immediately before oil extraction is vital to reduce the moisture content to its minimum. In the present study, the effects of five drying temperatures (313, 323, 333, 343 and 353 K) on the degree of moisture loss from Jatropha seeds at storage and the suitability of the drying processes to reduce the seed moisture to its minimum were investigated. The drying experiments of non-pretreated (whole seeds) and pretreated (crushed seeds) seeds were performed in a heating furnace. It was found that increasing in drying temperature promoted the rate of moisture loss, and the evaporation of moisture from the crushed seeds was faster than that of the whole seeds. However, the largest weight loss (6.47%) and the smallest seed residual moisture content (0.34%) were obtained when the whole seeds dried at 353 K. The findings of the present experiments suggested that drying the whole seeds of Jatropha at 353 K could provide dried seeds with suitable moisture content for oil extraction and/or in situ biodiesel production.

Tadesse, M., Dobo, B., & Birmeka, M. (2019). Prevalence and associated risk factors of intestinal parasitic infections among school children in Bamo no. 2 primary school, Adele town, East Arsi, Ethiopia. *Sub-Saharan African Journal of Medicine*, *6*(2), 77.

Abstract

Introduction: Intestinal parasitic infection (IPI) is one of the major and serious medical and public health problems in developing countries including Ethiopia. Effective prevention and control of IPIs require the identification of local risk factors, particularly among school children. **Objective:** This article assesses the prevalence of IPIs and associated risk factors among

school children in Bamo no. 2 primary school in Adele town, East Arsi in southeast Ethiopia. Materials and Methods: Study participants were selected by using multistage sampling technique. A total of 417 school children were enroled in Bamo no. 2 primary school in Adele town, East Arsi. Structured questionnaires were used to identify environmental, sociodemographic, and behavioral factors. Stool specimens were collected and examined for parasites using direct smear and formal-ether concentration technique. Data were analyzed using SPSS Version 20. A bivariate and multivariate logistic regression analysis was done. P value less than 0.05 was considered as statistically significant. **Results:** The overall prevalence of IPIs in the present study was 113/417 (27.1%), for at least one intestinal parasite. A total of six parasites were the most prevalent were Ascaris detected: *lumbricoides* [50 (12.00%)], *Entamoeba histolytica/disp*ar [43 (10.3)], *Trichuris* trichiura [35 (8.4%)], *Giardia lamblia* [31 (7.4%)], Hymenolepsis nana [13 (3.1%)], and Teania saginata [12 (2.9%)]. In addition to these, single [49 (15.45%)] and multiple [64 (20.18%)] infections were identified. In this study, the most significantly associated risk factors for the occurrence of IPIs were grade level, water type used, hand washing habit before meal and after defecation, defecation habit, and eating unwashed/uncooked vegetable (P < 0.05). Conclusion: Intestinal parasites were prevalent in varying magnitude among the school children. Therefore, the Woreda health office, school community, and nongovernmental organizations need to give education on personal hygiene and environmental sanitation, and treatment should be taken into account to reduce the prevalence of IPIs.

Keywords: Adele town, Associated risk factors, Intestinal parasitic infections, Prevalence school children

Dobo, Y. M. Z. B. B. (2019). Prevalence of HIV and Associated Risk Factors Among Adults in Negele Borena Hospital, Guji zone, Oromia Region, Ethiopia. *Journal of Health, Medicine and Nursing*, 68., 17-28

Abstract

Background:- The peak incidence of Human Immunodeficiency Virus (HIV) infection occurs among adults who are at the most productive age of the population. They are vulnerable to HIV because of their age, living arrangement, and cultural influences. Objective:- The aim of this study is to determine the prevalence of HIV infection and its risk factors among adults in Negele Borena Hospital. Method:- A cross-sectional study was conducted on 384 adults in Nagele Borena Hospital from April to September, 2017. Self-administered questionnaire was used to collect data on socio-demographic variables, knowledge of HIV/STIs and behavioral factors. In collaboration with the hospital work, whole blood samples were tested for the presence of antibody to HIV infection using National HIV rapid diagnostic tests algorithm. Chi-square test was conducted to identify risk factors, and finally, regression analysis was computed to identify the independent risk factors that influence the incidence of HIV/AIDS. Results:- The sero-prevalence of HIV was 11(2.86%) where 4(2.03%) and 7(3.74%) were males and females respectively. Alcohol drinking (AOR=5.2(1.1-25) and khat chewing (AOR=5.8, 95%CI 5.8 (1.3-27) discuss about sexual issues openly with their family AOR=13, 95% CI 13(1.6-102), peer pressure AOR=22.9, 95% CI 22.9 (3.9-131) and multiple sexual partner (AOR=5.2, 95%CI 5.2(0.9-29) were the risk factors for HIV infection and HIV/AIDS transmission determinants. Conclusion and recommendation:- The prevalence of HIV infection among adults of Negele Borena Hospital is high. New infection among young people suggested that the disease is not under control yet in the country. Therefore, planning strategy to prevent the spread of HIV infection in town is critical.

Keywords: Behavior, HIV/AIDS, Prevalence, Risk factor, Transmission

Eyamo, T., Girma, M., Alemayehu, T., & Bedewi, Z. (2019). Soil-transmitted helminths and other intestinal parasites among schoolchildren in southern Ethiopia. *Research and Reports in Tropical Medicine*, *10*, 137.

Abstract

Background: Intestinal parasitic infections are the neglected tropical diseases that have a devastating effect and leads to malnutrition, morbidity and mortality in schoolchildren. The aim of this study was to determine the presence of soil-transmitted and other intestinal parasites among schoolchildren in southern Ethiopia. Methods: A cross-sectional study was conducted in Gara Riketa primary school children at Hawassa Tula Sub-City, Southern Ethiopia from March 1 to April 20, 2017. The parent of participating children was interviewed with a structured questionnaire to collect the sociodemographic and risk factors data. Well-trained laboratory technicians were involved in the stool examination through direct and concentration methods. The data were entered and analyzed using SPSS version 20. ORs at 95% CI were considered as a statistically significant association with a p-value < 0.05. Results: out of 384 schoolchildren enrolled for the study, 260 (67.7%) were infected with one or more intestinal parasites. The predominantly identified parasite was Ascaris lumbricoides 146 (38.0%) followed by hookworms 12 (3.1%). The study showed that intestinal parasitic infections have a statistically significant association with being in 4th grade, the mother's educational status (grade 9-12), having cut nails and washing hands before eating. Conclusion: the rates of soil-transmitted helminths and other intestinal parasitic infections were very high in Gara Riketa primary school children. Based on the statistical analysis, hygiene and nail clipping are important habits to prevent infection with intestinal parasites.

Keywords: Hawassa, Intestinal parasites, Prevalence, Risk factors, Schoolchildren

Sime, G., & Aune, J. B. (2019). Rural livelihood vulnerabilities, coping strategies and outcomes: A case study in central rift valley of Ethiopia. *African Journal of Food, Agriculture, Nutrition and Development, Volume 19, Issue 3, Pages 14602–14621.*

Abstract

Extensively vulnerable mixed rain-fed farming system is the underlying mainstay of livelihoods of farmers in the central Rift Valley of Ethiopia. This study aimed to assess determinants of farmers' livelihood vulnerabilities to shocks, their coping strategies and outcomes. Cross-sectional data were collected from farmers, agricultural experts, and other development workers through formal and informal focus group discussions, key informant interviews and complemented by field observations. Results showed that natural, institutional, and physical factors are the overriding determinants triggering rural livelihood vulnerabilities to frequent food shocks. Particularly, unpredictable rainfall timing and severity, and ineffective early warning system had practically escalated livelihood vulnerabilities to food shocks. Farmers varied in their assets and socioeconomic capabilities, including wealth status, livestock and poultry holding size, farm size and its soil fertility status, participation in local social networks, and financial capital and access to credit facilities. Farmers also varied in their vulnerability to encountering food shocks and capability to coping. Strategies practiced by households to increase livelihood resilience to rainfall variability include selection of appropriate crop variety, selection of appropriate calendar for planting, intercropping, crop rotation and indigenous in situ rainwater harvesting. Sharing grains among households themselves, selling small ruminants, engaging in off-farm activities and migration were key ameliorative strategies to handle small-scale and temporary food shocks. While, institutional interventions with Food Aid and Safety Net programs were commonly used the underlying coping strategies for severe and large-scale food shocks. The as livelihood outcomes were characterized by continued endeavors to avert the inappropriate land management system, to adapt to the recurrent drought and dry spells, and to improve the inadequate early warnings condition for seasonal agro-meteorology. Therefore, authors suggest concerted efforts of stakeholder institutions and local communities to improve the livelihood outcomes that should enhance household capabilities, activities, assets and accesses; reduce vulnerabilities to shocks; and ensure sustainable agricultural production system in central Rift

Valley of Ethiopia.

Keywords: Sustainable livelihood approach, Asset, Rainfall variability, Food shock, Outcome, Semi-Arid Ethiopia

MZ, H., ET, M., & FD, G. (2019). Physicochemical Characterization of Muicipal Solid Waste in Sawla town, Gofa Zone, Ethiopia. 23(11), 2023–2029.

Abstract

To design and develop integrated waste management systems, it is necessary to have information about the physical and chemical characteristics of the household's municipal solid waste (MSW). The study aims to characterize the physicochemical composition of MSW in Sawla town, Ethiopia using structured questionnaire and field observation to obtain data on the socio-economic condition and current MSW management practices of the residents. The data showed that, the town has no sanitary landfill. The per capital daily SW generation for HH range 0.21-1.02 kg/capital/day with mean value of 0.51 kg/capital/day. Regarding its chemical characteristics, the HHMSW was composed of main food and organic waste (34.81%) and ash-dust (49.45%). The remaining 6.08 of plastic, 3.87 % glass, 3.51% of paper and 2.28% of metal waste. The mean percentage moisture content, volatile matter content, ash content and fixed carbon content of the MSW were 25.57%, 28.09%, 32.03%, and 14.32% respectively. The mean density, pH and fusing point of ash for the MSW were 613.22kg/m3, 10.657 and 965^oC respectively. Using AAS, the concentration of heavy metals Cu, Pb, Zn, Co, Cd, and Cr were determined and the result was 2.59, 7.12, 293.39 and 0.125mg/kg for Cu, Pb, Zn, and Co respectively. The concentration of Cd and Cr was not detected. In conclusion, the best ways to tackle the problems related to MSWM practices of residents are: improving the institutional structure and budget allocation of the SBD, the involvement of stakeholders SWM practices, implementation of sustainable SWM practices through awareness creation and training and implementation of rules and regulation. The result of this study suggest that biodegradable SW constituted a lion share of the SW generated in the town. Thus, the municipality can recover this organic fraction by introducing integrated urban agriculture that might convert this waste to organic fertilizer though composting.

Mekibib, B., Abdisa, D., Denbarga, Y., & Abebe, R. (2019). Muscular Sarcocystis infection in ruminants slaughtered at Municipality abattoir and selected Hotels in Hawassa city, southern Ethiopia: Prevalence and associated risk factors. *Veterinary Parasitology: Regional Studies and Reports*, *18*, 100333.

Abstract

Sarcocystosis is a parasitic zoonosis caused by *Sarcocystis* spp. which are Apicomplexan parasites requiring intermediate and definitive hosts to complete their life cycle. Although the parasite has worldwide distribution in man and many species of animals, the prevalence in most parts of Ethiopia is not clearly known. This cross sectional study was conducted between Nov. 2016 and May 2017 to estimate the prevalence of Sarcocystis infection in ruminants slaughtered in the municipality abattoir and at selected hotels of Hawassa city and to assess the potential risk factors. Data were collected through gross and histopathological examination of myocardial and esophageal muscles sampled from a total of 561 ruminants (176 sheep, 181 goats and 204 cattle). The overall prevalence of Sarcocystis infection in ruminants was 68.98%. All of the cysts were microscopic, and found more frequently (p < .05) in heart (62.08%) than esophageal muscle (45.45%) although concurrent infection of both organs was observed in 33.87% of the ruminants examined. No significant association was noted between Sarcocystis infection and the origin, sex and species of ruminants examined (p > .05). The higher prevalence recorded in the study area can be explained by the abundance of stray dogs, cats and wild carnivores that are roaming in the villages, lack of proper latrine, uncontrolled disposal of condemned officials and carcass, and provision of uncooked meat for dogs and cats. Thus, farmers' awareness creation and strategies targeted at breaking the life cycle of the parasite are required to reduce the prevalence of the parasite and thereby the foreseen zoonotic and economic impact.

Aseffa, A., Abate, E., Seyoum, B., Kassa, T., Abebe, T., Amsalu, A., Bitew, A., Alemayehu, T., Ayenew, Z., & Gizachew, Z. (2019). INVESTIGATIONS ON ANTIMICROBIAL RESISTANCE: CONTRIBUTIONS OF A CLINICAL RESEARCH NETWORK. *Ethiopian Medical Journal*.

Abstract

Introduction

Antimicrobial resistance (AMR) has recently gained global recognition as a priority health care challenge. There is growing consensus that at the rate resistance is developing against existing drugs, and in the face of prevailing deficit in new therapeutic options, emergence and spread of untreatable infections "a postantibiotic era" is a "very real possibility" (1); with a strong potential to reverse the gains of modern medicine in the last century. As such, AMR has been dubbed a global health security threat.

Most antibiotics are prescribed on the basis of collective experience without accurate knowledge of the microbe or its susceptibility to antibiotics. The collective experience will however need to be calibrated based on current data for this approach to sustain. Otherwise, the prevalent practice of empiric treatment that is not further adjusted based on laboratory culture and sensitivity data contributes to poor treatment success and adds to avoidable adverse events. Often, the most potent, reserve or broad spectrum antibacterial agents are prescribed as a first resort exposing them to early loss of potency with emerging resistance. The secondary effects of depleted drug choices mean that mortality from surgical interventions, cancer chemotherapy, organ transplantation and other services that rely on antibiotic support would rise. The combined effect at national level is higher health care cost as more treatments fail, more toxic alternatives are applied and drug import costs escalate. There are obvious advantages of empiric therapy as extensive microbiological diagnostics are often not feasible or available on time, even in hospital settings. The rapid spread of drug resistance is forcing antibiotic treatment guidelines to become more and more tailor made with due consideration of the prevailing antibacterial resistance situation in the region or in the health facility and the clinical condition of the patient.

Nowadays, clinicians are finding it increasingly difficult to reliably treat common bacterial infections. In the past, antibacterial resistance (ABR) was mainly seen in hospitals but today community acquired infections with resistant bacteria are increasingly frequent. ABR has

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reached "alarming levels" globally but the true magnitude is often difficult to assess due to significant gaps in surveillance, lack of standards in methodology and difficulties in generalizability of small data sets and sample sizes.

Different antibiotic resistance patterns of bacteria are currently characterized based on an emerging consensus on terminology. Although these classifications are developed for the purposes of epidemiological monitoring they are also valuable for clinical purposes as well. The definition is based on standard sensitivity testing using clinical cut off points against an antibiotic. Antimicrobial categories were constructed for organisms or organism groups. An indicator antibiotic can be tested as representative of a category. "A bacterial isolate is considered resistant to an antimicrobial category when it is 'non-susceptible to at least one agent in a category" (2) due to acquired resistance. Multidrug resistance (MDR) is defined as non-susceptibility to at least one agent in three or more antimicrobial categories. Extensive drug resistance (XDR) is defined as non-susceptibility to at least one agent in all but two or fewer antimicrobial categories (i.e. bacterial isolates remain susceptible to only one or two categories). Pandrug resistance (PDR) is defined as non-susceptibility to all agents in all antimicrobial categories (i.e. no agents tested as susceptible for that organism) (2). Seventeen antimicrobial categories and agents have been de-scribed to define MDR, XDR and PDR for Entero-bacteriaceae and the same number for S aureus in the interim list proposed by the joint initiative of the European and American Centers for Disease Control and Prevention (CDC).

A high level of resistance was observed against common bacterial agents in a recent systematic review of the literature on AMR in Africa. There was no data for 40% of the countries and the quality of information was poor for the rest (3). A common challenge was the lack of standardization of microbiological identification and susceptibility testing procedures. Clinical practice guidelines provide recommendations on empirical antibiotic prescribing. A common weakness of such guidelines is that they are often not based on local resistance patterns. Empirical antibiotic treatment was for example discussed in relation to specific microbiologic data in only 16 of 135 (6.4%) guidelines in a recent survey (4). Guidelines "did not routinely consider resistance in their recommendations. Decisionmakers should analyses and report the extent of local resistance patterns to allow better decision making".

The Ethiopian Food, Medicine and Health Care Administration and Control Authority (FMHACA) 2009 baseline AMR survey report mentions that 61% of health facilities have treatment guidelines (5). The same report underlines however that "no education on the proper use of antimicrobials was given to clients in the health facilities"; that "although the level and training type differs in aggregate, prescribers' knowledge of antimicrobials was, in certain categories, seriously compounded with the often empirical practices used during treatment; and that "even if there was some awareness of nosocomial infections, little is done by facilities to prevent and contain it" (6). Contamination, especially with commensal flora is a common challenge in clinical bacteriology. Coagulase negative staphylococci (CoNS) are common contaminants, usually not considered where more virulent pathogens are isolated from specimens. In cultures where CoNS are the only isolates, such as in blood cultures, the decision to consider the isolate as pathogen should be a clinical decision. Laboratory data are however very rarely counter checked against clinical course of disease limiting the quality of data generated in microbiology laboratories. It is generally recommended that at least two separate samples are positive for CoNS before a diagnosis of CoNS infection is made. In vitro antimicrobial sensitivity test reading may be affected by inoculation density, quality of the agar medium, measurement of the inhibition diameter, incubation conditions and quality of sensitivity disks applied.

Mekbib, B., Dejene, S., & Abebe, R. (2019). First Report of Avian Infectious Laryngotracheitis Outbreak in Small Scale Chicken flocks around Hawassa City, Ethiopia. *Bull. Anim. Hlth.Prod.Afr*, 67, 239–245.

Abstracts

The growing small scale poultry production in most developing countries is challenged by several factors including diseases of varied etiologies. This study aimed to describe the first outbreak of infectious Laryngotracheitis (AILT) in exotic layer chickens managed under semi-intensive production systems in Ethiopia. Outbreak investigations were made between June and July, 2018 following a report of a severe disease outbreak in three small scale poultry farms located at Dore Bafano kebele, Sidama zone. A team of veterinarians then traveled to the area to undertake physical examinations, collect the history and circumstantial evidences and representative

chickens for further examinations. To characterize the lesions, systematic postmortem examinations and histopathology were carried out on eight critically sick and four recently dead chickens. The dominant clinical signs were extension of the neck, long-drawn-out gasps, gurgling, rattling, coughing and death after 5 to 8 days of illness. The morbidity and mortality rates were about 98% and 80%, respectively. The mortality rate reached a peak within two days of onset and then gradually declined but continued for 2 weeks. The gross lesions were restricted to the upper respiratory tracts and ranged from hemorrhagic tracheitis, mucoid rhinitis, and blood-stained mucus along the length of the trachea of critical sick chickens to diphtheritic or caseous necrotic plaques and plugs in the trachea, larynx and mouth of recently dead chickens. The hallmark microscopic lesions were erosion and ulceration of the tracheal mucosa, lymphohistocytic and heterophilic inflammatory infiltrates of the submucosa and eosinophilic intranuclear inclusion bodies in most of the tracheal epithelial cells forming syncytia. Based on the collected information at different levels and while awaiting the results of virus isolation and molecular investigation, the current investigation discovered the outbreak of Avian Infectious Laryngotracheitis for the first time in Ethiopia. The virus/disease may have entered the country through contaminated crates along with the importation of day old chicks and remained undetected or misinterpreted because of the poor veterinary services and reporting systems.

Keyword; Infectious laryngotracheitis, First report, Histopathology, Improved chickens, Ethiopia

By Dessie, Y., Tadesse, S., Eswaramoorthy, R., & Abebe, B. (2019). Recent developments in manganese oxide based nanomaterials with oxygen reduction reaction functionalities for energy conversion and storage applications: A review. *Journal of Science: Advanced Materials and Devices, Volume 4, Issue 3, Pages 353–369., Date 2019*

Abstract

In this article, a brief overview of manganese oxide nanomaterials (NMs) potential towards oxygen reduction reaction (ORR) for microbial fuel cell (MFC), bioremediations, and battery applications is discussed. It's known that using non-renewable fossil fuels as a direct energy source causes greenhouse gas emissions. Safe, sustainable and renewable energy sources for biofuel cell (BFC) and metal-air batteries hold considerable potential for clean electrical energy generators without the need for a thermal cycle. In an electrochemical reaction system, the four-electron reduction

from molecular oxygen at the air-cathode surface to hydroxide ion or water at a reasonably low overpotential was the ultimate goal of many investigations and plays a vital role in metal-air batteries and fuel cell device systems. Different Mn_xO_y nanostructured materials, from Biofunctional structural catalysts up to their electrocatalytic contributions towards ORR are discussed. Brief descriptions of ORR, principle strategy and mechanism, as well as recent developments of cationic dopants and electrolytic media, effect on the air-cathode surface of manganese oxide nanocatalyst are also discussed. Finally, challenges associated with platinum and carbon support platinum in improving electron and charge transfer between biocatalyst and air-cathode electrode are summarized.

Tadesse, S. (2019). Photovoltaic performance of dye-sensitized solar cell based on eosin-Y photosensitizer and quasi-solid state electrolyte. *Ethiopian Journal of Science and Technology, Extra Publisher: College of Science, Bahir Dar University, Volume 12, Issue, Pages 93–105, Date 2019*

Abstract

Dye-sensitized solar cells (DSSCs), as low-cost photovoltaic devices compared to the silicon based solar cells, have received extensive attention recently; although much work is necessary to reach optimal device efficiencies. This paper reports the fabrication and characterization of dye sensitized solar cells using TiO2 sensitized by eosin-Y. The electrodes, electrolyte (I-/I3 –), and dyes were assembled into a cell and illuminated by a light with an intensity 100 mWcm-2 to measure the photoelectrochemical parameters of the prepared DSSCs. According to the experimental results, the maximum quantum efficiency appeared at the wavelength of 510 nm with IPCE of 64.2%. The short circuit current density (JSC), the open circuit voltage (VOC), and power conversion efficiency (η %) were measured to be 6.4 mAcm-2 , 0.54 V, and 2.2%, respectively. The result of UV-visible absorption and IPCE measurement showed that the IPCE correlated to the absorption spectrum of the active layer. The IPCE and η % obtained in the present work was higher than the values reported earlier for the liquid state electrolyte system indicating that the quasi-solid-state electrolyte could substitute the liquid state.

Keywords: Dye sensitized solar cells, Eosin-Y, Quasi-solid-state electrolyte.

Kebedow, K. G., & Oppen, J. (2019). Including Containers with Dangerous Goods in the Cargo Mix Problem for Container Vessel Stowage. Publication: *Communications-Scientific Letters of the University of Zilina*, 21(2), 100–113.

Abstract

The Cargo Mix Problem (CMP) chooses and distributes types of containers to load into bay subsections of a container vessel. In this paper, we extend existing Mixed Integer Programming models for the CMP by considering containers with dangerous goods. We show that our model can be optimally solved in reasonable time using standard software.

Habteyohhanis, B. A., & Tegegne, T. T. (2019). Analysis of a mathematical model on the spread and control of tuberculosis in deneba town, Ethiopia. *International Journal of Advanced Research in Engineering and Applied Sciences*, 8(1), 20–42.

Abstract

Most of mathematical modeling dealing disease curable by optimally: In this study, a non-linear deterministic model was developed to study the spread and control of Tuberculosis in the community of Deneba town in Ethiopia. The whole population of Deneba town were divided into five compartments namely, Susceptible class under fourteen, Susceptible class equal and above fourteen, Exposed class, Infected class and Recovered class was represented by ,S1 ,S2 ,E, I and R respectively. The basic reproduction number of the dynamical system R_0 is calculated by R_0 =

$\frac{\beta_1 \delta \mu(\alpha + p\mu) + \beta_2 \delta c(\alpha + q\mu)}{\mu(\mu + c)(\alpha + \mu)(k + \mu + d)}$

which depends on ten parameters. And also the numerical value of the basic reproduction number based on the real data collected from Deneba town R_0 = 2.981008273>1. This in principle implies that the disease spreads in the community of Deneba town. Basically we found two equilibrium points namely disease free equilibrium point and endemic equilibrium point. As a result, the disease-free equilibrium point is unstable and the endemic equilibrium point is stable. To control the spread of Tuberculosis, the basic reproduction number should be less than one. Therefore, this finding identify the control parameter β_2 is the contact rate of susceptible class equal and above fourteen with infected class, β_2 = 0.068511865 Thus, the basic reproduction number is less than one, the contact rate must be less than 0.068511865 . The effect of the remaining control parameters was discussed in detail in the subsection.

Keywords: Tuberculosis, Bacillus Calmette–Guerin, Reproduction Number, Numerical simulation. Equilibrium point

Mohammed, E. T., Gonfa, B. A., Kedir, F., & Anshebo, T. Y. (2019). Investigation on the Effects of Additive on Performance and Photostability of PCDTBT: PC71BM Solar Cells. *International Journal of Photoenergy*, *2019*.

Abstract

In this work, the effect of DIM on the PCE and photostability of PCDTBT: PC₇₁BM PSCs was investigated. DIM is an effective additive in a BHJ PCDTBT: PC₇₁BM solar cell since it fulfills the requirement of a selective PC₇₁BM dissolution. PCE of the device based on PCDTBT: PC₇₁BM processed with DIM is higher than that of the reference device. In terms of the device stability, the PSCs processed with DIM showed poor stability at longer light exposure time. For the device without DIM especially as the light exposure time was increased, the device stability was better because the PCDTBT could be shielded from air by an aggregated PC₇₁BM layer. For the PCDTBT: PC₇₁BM device processed with DIM, the results obtained from measurement indicates that it has a lower recombination rate. The result from IS measurement shows that for pristine PCDTBT: PC₇₁BM devices with 3% DIM, the active layer resistance is lower compared to the device without DIM. However, after irradiating the device for 5 hr, the resistance of the device processed with DIM is higher and it is consistent with decreased PCE of the aged device.

Haile, M., Mohammed, E., & Gebretsadik, F. (2019). Physicochemical characterization of municipal solid waste in Sawla town, Gofa Zone, Ethiopia. *Journal of Applied Sciences and Environmental Management*, 23(11), 2023–2029.

Abstract

To design and develop integrated waste management systems, it is necessary to have information about the physical and chemical characteristics of the household's municipal solid waste (MSW). The study aims to characterize the physicochemical composition of MSW in Sawla town, Ethiopia using structured questionnaire and field observation to obtain data on the socio-economic condition and current MSW management practices of the residents. The data showed that, the town has no sanitary landfill. The per capita daily SW generation for HH range 0.21- 1.02 kg/capita/day with mean value of 0.51 kg/capita/day. Regarding its chemical characteristics, the HHMSW was composed of main food and organic waste (34.81%) and ash- dust (49.45%). The remaining 6.08% of plastic, 3.87% glass, 3.51% of paper and 2.28% of metal waste. The mean percentage moisture content, volatile matter content, ash content and fixed carbon content of the MSW were 25.57%, 28.09%, 32.03%, and 14.32% respectively. The mean density, pH and fusing point of ash for the MSW were 613.22 kg/m³, 10.657 and 965 °C respectively. Using AAS, the concentration of heavy metals Cu, Pb, Zn, Co, Cd, and Cr were determined and the result was 2.59, 7.12, 293.39 and 0.125 mg/kg for Cu, Pb, Zn, and Co respectively. The concentration of Cd and Cr was not detected. In conclusion, the best ways to tackle the problems related to MSWM practices of residents are: improving the institutional structure and budget allocation of the SBD, the involvement of stakeholders in SWM practices, implementation of sustainable SWM practices through awareness creation and training and implementation of rules and regulations. The result of this study suggests that biodegradable SW constituted a lion share of the SW generated in the town. Thus, the municipality can recover this organic fraction by introducing integrated urban agriculture that might convert this waste to organic fertilizer through composting.

Keywords: Solid waste, Waste characterization, Proximate analysis, Heavy metalAnalysis of

Melaku Zigde Haile, Endale Tsegaye Mohammed (2019). Physico-chemical Characteristics of Water Collected from Different Sampling Sites of Lake Hawassa, Ethiopia. *Scientific & Academic Publishing*, 9(2), 38-45, Date 2019

Abstract

The research aimed to evaluate the current water quality status of Lake Hawassa in order to identify potential pollution sources, and put in place monitoring programs. Eleven potential sampling sites were included in the study. Water quality parameters, such as total dissolved solid (TDS), pH, temperature, conductivity, turbidity, dissolved oxygen (DO), five day biological oxygen demand (BOD5), total hardness as CaCO₃, total alkalinity as CaCO₃, nitrate, sulphate, orthophosphate, fluoride, K, Mg, Cu, Cd, Cr, Fe, Mn, Pb, and Zn were determined and compared with WHO standards. The results were compared with the WHO and FAO standards. And the values of TDS (381.7 to 1286.0 mg/L), SC (733.7 to 2151.3 µS/cm), turbidity (8.20 to 87.3 NTUs), BOD₅ (4.02 to 76.2 mg/L), phosphate (0.348 to 1.90 mg/L), fluoride (11.6 to 17.5 mg/L), chromium (0.173 to 0.665 mg /L), manganese (0.133 to 1.83 mg/L), and copper (1.40 L to 18.2 mg/L) were found above the prescribed limit of WHO guidelines for drinking purposes, while all the analysed water quality parameters were fall within the FAO standard limit for irrigation purposes. These suggested that both point and non-point pollution sources such as human sewage, industrial waste from ceramics, textile, plastics and food processing industries, urban stormwater, agricultural runoff and land development were impacting the lake. Thus, mitigation measures should be put in place to prevent the Lake from further deterioration.

Keywords: Water pollution, Water quality parameters, Toxic metals

Helelo, A., Senbeta, A., & Anshebo, S. (2019). Assessment of Solid Waste Management (SWM) Practices in Hawassa University Campuses, Ethiopia. *Journal of Applied Sciences and Environmental Management*, 23(6), 1081–1086.

Abstract

This study was conducted in four campuses of Hawassa University (HU), Ethiopia, with the aim of identifying the major sources, composition and quantity of solid wastes and solid waste management (SWM) practices. Key informant interview and visual assessment was carried out to identify the major sources, sampling sites, measurement points and management practices. The

wastes were segregated and categorized into classes and measured for seven consecutive days in each campus. The result showed that about 35,364.2 Kg of food leftover and more than 10,541.4 kg of paper, plastic, grass and leaves, medical waste, and some other mixed solid waste were generated every week. From the total waste more than 92 % was recyclable and 81.5% was organic. The food leftover was managed by selling to ranchers, giving it to poor-of-the poor, and the remaining was managed through damping. The clinical wastes, papers and some other wastes were burned and only limited solid waste was recycled. Generally, the SWM practice in HU is reactive to the problems and a more proactive solution is required. For instance, conversion of organic waste to biogas could reduce the cafeterias cooking firewood spending, greenhouse gas emission and other socio-economic and environmental impacts associated with SWM problem. Recycling of paper waste by selling to pulp and paper factory can also be a feasible and win-win strategy for the university and the environment as the experience gained from Adama Science and Technology University.

Keywords: Hawassa University, Solid Waste, SWM, SW recovery, SW Recycling

Lelisho, T. A. (2019). Theoretical study on the efficacy of DBN/LiBr system as a catalyst for fixation of CO2 with propylene oxide: Solvent effects on activation barriers. *Computational and Theoretical Chemistry*, 1158, 22–28.

Abstract

The fixation of carbon dioxide with <u>propylene</u> oxide (PO) catalyzed by DBN/ LiBr system to produce a five-membered cyclic carbonate, has been extensively studied employing <u>DFT</u> <u>method</u> in <u>gas phase</u> and in solvents. The <u>solvent effects</u> were considered by means of a PCM model. The title reaction was investigated in the absence of catalyst, in the presence of LiBr alone and DBN/LiBr mediated pathways. Two hypothetical reaction pathways were proposed for DBN/LiBr catalyzed reaction and their corresponding energetics are explored to demonstrate the favorable route. DFT results indicated that mechanism I is more favorable pathway kinetically and thermodynamically than mechanism II. The more favorable pathway comprises three main steps: ring-opening of the <u>epoxide</u> by Br- <u>anion</u>, carbon dioxide insertion, and ring-closure process. The <u>free energy of activation</u> computed at the B3LYP/6-311++G(d,p)//B3LYP/6-31+G(d,p) level reveals that the <u>rate-determining step</u> is the ring-opening of epoxide; which demanded 34.95, 22.55, 19.83 and 19.75 kcal/mol in gas phase, diethyle ether, ethanol and water, respectively. The carbon dioxide insertion step was determined to be barrierless. Although the ring opening step is endothermic, the overall reaction is exothermic. Finally, the catalytic activity of other catalysts reported for the title reaction somewhere else was compared with the activity of DBN/LiBr system.

AYCHILUHIM, W., & Ayichew, A. (n.d.). Anthropometric and Hematological Profile of some selected Ethiopian Premier League Male Soccer Players in the Final Competitive Season. *Turkish Journal of Sport and Exercise*, 21(2), 244–251.

Abstract

The purpose of the study to determine anthropometric and hematological profile of some selected Ethiopian premier league male soccer players according to playing position. Descriptive cross-sectional study was employed on purposely selected twenty eighty premier league soccer players from (14) Sidama Coffee and from (14) Hawassa Town soccer club from all positions (GK, DF, MD, SK). Anthropometric, speed, agility and seventeen hematological parameters (WBC, RBC, Lymph, HGB, HCT, MCV, MCH, MCHC, PLT, RDW-CV, RDW-SD, PLT, MPV, PDW, PCT, P-LCC, and P-LCR) were measured. The obtained quantitative data was analyzed by one way analysis of variance (ANOVA) (p0.05). It could be considered that regular monitoring of the anthropometric and hematological parameters is fundamental for the identification of a health status and related optimal performances by sport medicine specialist, nutritionist, trainers and selection of adequate training intensity by trainers. From a practical point of view, the clinician has to take into account not only age, but also training status of individuals when evaluating their blood tests.

Key words: Ethiopian premier league, Hawassa Town, Hematological profile, , Sidama Coffee
Workineh, W., & Aychiluhim, W. (n.d.). The Effect of Selected Therapeutic Exercises For Management Of Type Ii Diabetes In The Case Of Arba Minch General Hospital. 71, 65–

Abstract

The study was conducted to investigate the effect of selected therapeutic exercises for management of type II diabetes patients in the case of Arba Minch General Hospital. The subjects of the study were selected from Arba Minch General Hospital outpatient department and their age ranges between 36-55 years. Subject of the study were screened by using availability sampling techniqueand selected participant were assigned systematically to either experimental (n = 11) or control group (n=11). Experimental groups followed a supervised therapeutic training program three times per a week for 12 weeks and 40-60 minute duration per day. To this end quasi experimental research design followed by comparative approach was employed. Descriptive statistics and paired sample t test was utilized to determine the significance change at 95 % confidence level (p < 0.05) of the outcome measures from pre to posttest in both groups. Participants completed body mass index, fast blood glucose, heart rate, blood pressure, triglyceride, total cholesterol and uric acid measures. The result obtained in this study indicates that in experimental group were significant improvements in body mass index, fast blood glucose, and Serum uric acid, but mean value of few physiological variable increases in the case of heart rate, triglyceride and total cholesterol in both group but statically no significant difference. In conclusion, some selected therapeutic exercise training counteracted improves physiological health function of type 2 diabetic patients in intervention group while the control group did not improve physiological health function without the involvement of selected therapeutic exercise.

Keyword: Type 2 diabetes mellitus, Therapeutic exercise, Fasting blood

Tole, Tegene T, Jordaan, J. H., & Vosloo, H. C. (2019). Catalysis of linear alkene metathesis by Grubbs-type ruthenium alkylidene complexes containing hemilabile α, α-diphenyl-(monosubstituted-pyridin-2-yl) methanolato ligands. *Beilstein Journal of Organic Chemistry*, 15(1), 194–209.

Abstract

Four new Grubbs-type precatalysts [RuCl(H₂IMes)(O^N)(=CHPh)], where [O^N = α, α -diphenyl-(3-methylpyridin-2-yl)methanolato, α, α -diphenyl-(4-methylpyridin-2-yl)methanolato, α.αdiphenyl-(5-methylpyridin-2-yl)methanolato and α,α-diphenyl-(3-methoxypyridin-2yl)methanolato] were synthesized and tested for their activity, stability and selectivity in the 1octene metathesis reaction. Overall the precatalysts showed good activity and high stability for the metathesis of 1-octene at temperatures above 80 °C and up to 110 °C. Selectivities towards the primary metathesis products, i.e., 7-tetradecene and ethene, above 85% were obtained with all the precatalysts at 80 and 90 °C. High selectivities were also observed at 100 °C for the 4-Me- and 3-OMe-substituted precatalysts. With an increase in temperature an increase in isomerisation products and secondary metathesis products were observed with the latter reaching values >20% for the 3-OMe- and 3-Me-substituted precatalysts at 110 and 100 °C, respectively. All the precatalysts exhibits first-order kinetics at 80 °C with the 3-substituted precatalysts the slowest. The behaviour of the 3-substituted precatalysts can be attributed to electronic and steric effects associated with the adjacent bulky phenyl groups.

Keywords: Grubbs-type precatalyst; Hemilabile; L-octene metathesis; Pyridinyl-alcoholato ligand

Tole, Tegene Tesfaye, & Hussein, S. (2019). Pilot introduction of small-scale chemistry kits into two Ethiopian secondary schools. *African Journal of Chemical Education*, 9(3), 135–156.

Abstract

In this study we used small-scale chemistry kits (MYLAB) in order to promote small-scale experiments as a pilot project in two Ethiopian secondary schools. Laboratory conditions and experimental practices were assessed by interviews with the school principals and questionnaires to grade 10 students and the chemistry teachers. The teachers were given a hands-on training.

Experimental and control group of students were selected based on their grade 9 chemistry performances. Both groups were given a pre-lab talk; thereafter experimental group students conducted the experiments. The laboratory condition assessment revealed problems with chemicals, equipment, apparatus, electric installation, running water and technically-trained staff. The introduction of the kit into the schools and the hands-on training were considered a great achievement by the school principals and the teachers in alleviating the problems of chemistry practicals in the schools.

Mekibib, B., Mikir, T., Fekadu, A., & Abebe, R. (2019). Prevalence of Pneumonia in Sheep and Goats Slaughtered at Elfora Bishoftu Export Abattoir, Ethiopia: A Pathological Investigation. *Journal of Veterinary Medicine*, 2019.

Abstract

Accurate clinical diagnosis of pneumonia, the leading cause of mortality in small ruminants, is difficult and usually requires postmortem examination of the lungs. An active abattoir survey was conducted between November 2017 and April 2018 to estimate the prevalence and characterize the gross and histopathological lesions of pneumonic lungs in 864 clinically healthy young small ruminants (490 sheep and 374 goats aged 1.5 to 3 years) raised for meat in different parts of the country and slaughtered at Elfora Bishoftu export abattoir, Ethiopia. Out of the total lungs examined grossly, pneumonic lesions were found in 158 (18.29%) lungs. On histopathological examination of the lungs with gross pneumonic lesion, however, typical pneumonic lesions were diagnosed in 148 (17.13%) lungs only. No significant (p>0.05) difference was noted in the prevalence of pneumonia between sheep (17.14%) and goats (17.11%) in histopathological examination. Based on the predominant histopathological findings, the pneumonic lesions were characterized as interstitial pneumonia (41.9%), acute suppurative bronchopneumonia (25.7%), acute fibrinous bronchopneumonia (24.3%), chronic bronchopneumonia (6.1%), aspiration pneumonia (4.7%), bronchointerstitial pneumonia (3.4%), and ovine pulmonary adenomatosis (3.4%). The study further showed the spread of ovine pulmonary adenomatosis and ovine progressive pneumonia (Maedi) from the central highlands to areas that were previously free from these diseases. Due to its better diagnostic capacity, histopathology should be employed routinely

as an ancillary test in the major abattoirs and regional veterinary laboratories to generate additional epidemiological data for a better disease control and prevention measures. Further studies are also recommended to identify the etiological agents of pneumonia in sheep and goats and thereby to formulate feasible and cost-effective interventions.

Berhe, M., Mekibib, B., Bsrat, A., & Atsbaha, G. (2019). Gastrointestinal helminth parasites of chicken under different management system in Mekelle town, Tigray region, Ethiopia. *Journal of Veterinary Medicine*, 2019.

Abstract

The poultry industry is an infant but fast growing sector in Ethiopia. However, it is largely dependent on local chicken managed under backyard production system. The sector is facing different challenges, mainly emanated from prevalence of infectious diseases such as helminth parasite species. Hence, this study came up with an aim to determine the infection rate and identify helminth parasite species in chickens managed under different production systems, in Mekelle, Ethiopia. A cross-sectional study design was employed, from November 2015 to March 2016. Postmortem (N=138) and fecal (N=410) samples of chicken were considered for necropsy and coproscopic examination to see both adult and eggs of helminth parasites, respectively. Similar gastrointestinal helminth parasites infection rate of chicken was obtained from both examination approaches (necropsy, 90.60%; and coproscopy, 90.97%). The study attested high prevalence (87.7%) of mixed infection with helminth parasites of chicken. Heterakis gallinarum (72.5%) and Ascaridia galli (68.8%) were found as the most dominant species (necropsy). During coproscopic examination cestode (89%) infections showed a relatively higher prevalence than nematodes (84.4%), although no difference was observed during that of necropsy examination results. Chickens of local breed from backyard production system had shown more likelihood of getting helminth infection when compared with their corresponding relatives (coproscopy). However, the variation was not statistically significant during that of necropsy finding. Therefore, the higher prevalence of parasitism and mixed infection observed in the study area would warrant for an urgent intervention with regular deworming scheme, and strict attention should be given towards hygienic measures and other health related management activities.

Sheferaw, D., Abebe, R., Fekadu, A., Kassaye, S., Amenu, K., Data, D., Geresu, E., Olbamo, G., Anjulo, A., & Yigebahal, Z. (2019). Prevalence of bovine trypanosomosis and vector density in a dry season in Gamo-Gofa and Dawuro Zones, Southern Ethiopia. *Veterinary Parasitology: Regional Studies and Reports*, *18*, 100343.

Abstract

Trypanosomosis remains one of the biggest constraints of livestock productivity in sub-Saharan Africa. It is of particular concern in Ethiopia where crop production is largely dependent on animal traction power. This study was conducted between November 2015 and March 2016 to estimate the prevalence of bovine trypanosomosis and vector density in Gamo-Gofa and Dawuro Zones located in Southern Ethiopia. For the entomological survey, a total of 305 NGU traps were deployed for three consecutive days at different positions in the two study areas. For parasitological study, blood samples were collected from 2402 cattle and examined for the presence of trypanosomes by the buffy coat technique (BCT). Blood samples that were positive in the BCT were further tested with Giemsa-stained thin smears for identification of Trypanosoma species. In the entomological survey, a total of 4113 flies were captured of which 1605 (39%) were tsetse flies while 2508 (61%) were other biting flies of the genus Stomoxys and Tabanus. Glossina pallidipes was the only tsetse fly identified in the study areas. The overall mean apparent density of G. pallidipes was 1.8 flies per trap per day (FTD). The overall prevalence of trypanosomosis in the study areas was 5.1% (95% CI: 4.2-6.0); however, it was significantly (p < 0.001) higher in Dawuro Zone (10%) than Gamo-Gofa (1.9%). Prevalence was also noted to be significantly (p < 0.001) higher in cattle with black coat colour and those with poor body condition. Trypanosomosis was caused mainly by Trypanosoma congolense (61.8%) and to a lesser extent by T. vivax (28.5%). Mixed infection by the two spp. was seen in 9.8% of the total positive animals. Evaluation of the mean packed cell volume (PCV) of the study animals with infection status revealed a significantly (p < 0.001) lower mean PCV in parasitaemic animals $(21.5 \pm 0.46\text{SE})$ than aparasitaemic ones $(24.3 \pm 0.11\text{SE})$. Generally, the prevalence noted in the current study is moderate. However the observation of such level of infection in a dry season suggests that the disease is still an important constraint of cattle production in the study areas. Thus, we recommend that the existing parasite and vector control interventions need to be

strengthened with special emphasis to Dawuro Zone where the prevalence was significantly higher. As the current sampling was done only once and in a dry season only, further longitudinal studies including all the seasons of the year need to be considered in the future

Berhe, K., & Aragaw, K. (2019). Abomasal nematode parasites in goats slaughtered in Mekelle town, northern Ethiopia. *Ethiopian Veterinary Journal*, 23(2), 90–100.

Abstract

Infection with abomasal nematodes, especially haemonchosis, is one of the most important problems challenging small ruminant production in the tropics. This study was carried out to identify nematodes infecting the abomasa, and estimate their prevalence and count in goats slaughtered in Mekelle town, northern Ethiopia. A total of 166 abomasa of goats were examined for postmortem differential adult nematode parasites count using standard procedure. *Haemonchus spp.* and *Trichostrogylus axei* were recovered from 126 (75.9%) and 109 (65.7%) abomasa, respectively. It was noted that 152 (91.6%) goats harbored at least one of the parasites, while 83 (50%) goats were found infected with both parasites. Mean and maximum adult worm counts were 39.2 and 270 and 55.2 and 600 for Haemonchus spp. and *T. axei*, respectively. Months of the year had significant (p<0.05) effect on prevalence and adult worm count in both species of parasites identified. The adult worm count and prevalence were relatively high in February for *Haemonchus spp.* and in December for *T. axei*. The high prevalence of these economically important parasites in goats in the dry season may entail insidious losses they could incur in the productivity of goats in the study area.

Keywords: Abomasal nematodes; Ethiopia; Goat; Haemonchus; Trichostrogylus axei

Shikabaw, M., & Gizaw, W. (n.d.). Hawassa City Communities Lifestyle and Challenges to Do Regular Physical Acivity and Exercise the Case of Administrative Civil Servants, Ethiopia. 32(1).

Abstract

The main purpose of the study is to evaluate Hawassa administrative city community's lifestyle and challenges to do regular physical activities and Exercise. Therefore, an explanatory mixed methods design is employed. The target population was Hawassa city administrative civil servants, 6626 in number in 2017, and study sample were selected by using multistage sampling techniques so that from 35 governmental civil service offices 500 (248 are females and 252 are males) civil servants were recruited and grouped randomly into Teachers', office workers', Lawyers, health workers', Engineers', and Runners (Guards, messengers and janitor) based on the nature of work they have Data was collected through questionnaire, focus group discussion (FGD) and field observation supported with secondary data from previous study, journals, articles, and books. Then both descriptive statics and inferential tools in which logistic regression were employed to analyses the collected data. From the first 500 distributed questionnaire, 466 samples were returned the questionnaire properly. As a result, predominant Civil Servant communities daily routine seem to accommodate health lifestyle in terms of smoking, alcohol usage and balanced diet. But most of them are physically inactive due to using technological outlets, work position lack of equipment, negative perception, negative background on physical activity, personal behavior, lack of parental and peer support, and environment or inconvenient residence area. Therefore, gender, regular physical exercise program participation, and the daily routines are directly associated with lifestyle of respondents at 0.05 level of significance. Whereas, age, work experience, exercise background, usage of balanced diet, and hypokinetic problem does not associate with lifestyle of respondents.

Key terms: Lifestyle, Regular physical activity, Exercise, Balanced diet, Smoking etc

Fentaw, D. A., Peter, M. E., & Abza, T. (2019). Synthesis and characterization of lanthanum chloride doped L-alanine maleate single crystals. Journal of Crystal Growth, Extra Publisher: Elsevier, 522, 1–4.

Abstract

Doping of non-linear optical materials by different elements and compounds is the common method to tune the various properties of these materials. In this work we report single crystals of undoped and lanthanum chloride (LaCl₃) doped L-Alanine Maleate (LAM) grown by slow evaporation solution growth method at room temperature. From the single crystal X-ray diffraction analysis it was observed that both undoped, 1 and 2 mol% LaCl₃-doped LAM samples were

crystallized in the orthorhombic crystal system with *P*2₁2₁2₁ space group. The optical properties of the LAM single crystals investigated by UV–VIS/NIR spectrometer revealed that the crystals were transparent in the wavelength range of 300–1100 nm. The band gap of the undoped and LaCl₃ doped LAM single crystals were found to be 4.13 eV. Energy dispersive X-ray analysis confirmed the incorporation of LaCl₃ in LAM single crystals. Simultaneous TG/DT analysis revealed the thermal stability of the samples below 145 °C. The second harmonic generation efficiency of the samples was analyzed by Kurtz-Perry powder technique and compared with the standard KDP crystal.

Department of Biology

Tolera, S. T., Sota, S. S., Derebie, E., & Mekonnen, T. H. (2019). Waste generation and physicochemical qualities of abattoir wastewater in Hawassa City, Southern Ethiopia. *East African Journal of Health and Biomedical Sciences*, *3*(1), 13–20.

Abstract

Background: Improper disposal of abattoir waste without any treatment has severe impacts on the environment and human health. However, there lacks sufficient studies that quantify abattoir waste and physicochemical parameters of wastewater. Thus, this study aimed to estimate waste generation and physicochemical characteristics of wastewater discharged from Hawassa municipal abattoir. Methods: A cross-sectional study was conducted at Hawassa Municipality Abattoir. One year of cattle slaughtering data was collected from the Hawassa municipality registry from March, 2016 to February, 2017. Mathematical computational approach were used to evaluate magnitude and composition of waste generated from the actual number of cattle slaughtered. Samples were collected from two wastewater sites on sewer line into which the abattoir wastewater was discharged . Physicochemical characteristics of the wastewater were determined by different laboratory investigation methods. Statistical Package for the Social Sciences (SPSS) software version 21 was used to analyze the mean , standard deviation and one tail of t-test for two mean sample value was assumed for equal variance with 95% Confident Interval (CI) to determine significant difference of each physicochemical parameter between the two sites.

Wondo Genet College of Forestry and Natural Resources

Betru, T., Tolera, M., Sahle, K., & Kassa, H. (2019). Trends and drivers of land use/land cover change in Western Ethiopia. *Applied Geography*, *104*, 83–93.

Abstract

Understanding the magnitude, direction and agents of land use/land cover change (LU/LCC) are important for planning sustainable management of natural resources. To this end, this study assessed the trends of LU/LCC and its drivers in Western Ethiopia. Landsat images of MSS (1978), TM (1986, 1991 and 2010), ETM+ (1999) and OLI (2013 and 2016) were used to study the dynamics of LU/LCC. The land use/land cover (LU/LC) maps for each period were classified using a hybrid method by merging the outputs of supervised classification and intensive on-screendigitizing techniques. The drivers of LU/LCC were studied using key informant interviews (KII) and focus group discussions (FGD). Four major LU/LC types namely forest, agriculture, shrub/grass, and settlement were identified with overall accuracies ranging from 91% to 94%. The result shows that forest was the dominant LU/LC type accounting for 69% in 1978 which later reduced to 13, 8.5 and 6.5 percent point (pp) in 1991, 2010, and 2016, respectively. Shrub/grasslands were also reduced by 11 pp from 2010 to 2016. Expansion of agricultural land was the major driver showing a radical increase by 13 pp between 2013 and 2016. Forest cover showed a reduction of 28 pp over the 38 years of the study period. In particular, 21.3%, 26%, and 16.6% of the forest was converted to shrub/grassland from 1986 to 1991, 1991 to 2010 and 2010 to 2016, respectively. But from 2010 to 2016, 19.13% of forest was converted to agriculture. The study showed that forest was first changed to shrub/grasslands and finally end up in agriculture showing that degradation is leading to deforestation. The result of FGDs and KIIs also showed that both small-scale subsistence agriculture and large-scale commercial agriculture are the major proximate drivers of deforestation in the study area. Population pressure from a multi-sourced and continued inflow of immigrants, lack of integrated institutional frameworks and unsustainable exploitations of forest products are the major underlying causes of the observed changes. Proper land use planning, legal backing, and institutional integration are key recommendations to sustain forest resources of the study area.

Keywords: Agricultural expansion, Assosa zone, Hybrid classification, Land use/land cover change, Remote sensing Western Ethiopia

Molla, M. B., & Mekonnen, A. B. (2019). Understanding the local values of trees and forests: A strategy to improve the urban environment in Hawassa City, Southern Ethiopia. *Arboricultural Journal*, *41*(2), 126–138.

Abstract

Urban trees and urban forests play important roles in the ecology of human habitats and the wider environment. However, these roles may be undermined by the community and resulting decline in urban forest cover over time. This study analyses the value of trees and forests in improving the urban environment and assesses the awareness level of communities of the value of trees and forests in Hawassa City, Ethiopia. A cross-sectional survey design was applied and data were obtained from a structured questionnaire survey of 200 respondents and from twenty-two interviews with key stakeholders. The collected data were analysed using descriptive statistics, chi-square test, and multiple linear regression models. Educational level and an annual income of the residents had strongly significant (p = 0.000) association with the awareness level of residents of the value of urban trees and forest. About 99% of the respondents noted that trees and forest have shading and cooling effects, 93% perceived trees as for recreational value, and 88% of them stated that trees and forests are important for city beautification. The chi-square test showed that there is a significant difference between forest-related services users and non-users. Multiple regression models indicated that sex, age, annual income and education level were found statistically significant (p = 0.000) and positively affect respondents' level of understanding about the value of urban trees and forest in improving the urban environment. Urban trees and forests have also played crucial roles, around reducing Urban Heat Island effect, improving shading and cooling services and reducing soil erosion, and this was statistically significant (p = 0.001). Lack of awareness on the use of urban trees and forest, limited public support for urban green infrastructure, poor policy and strategic guidance were found to be influential factors affecting the management of urban trees and forest. Rapid city-expansion has also contributed to lesser understanding and poor management practices of urban trees and forest. This implies that comprehensive inventories of urban trees and forest resources across the city should be conducted

using geospatial technologies. Thus, systematic and integrated stakeholder involvement is crucial to address those issues at local, regional and national levels.

Key words: Urban environment; trees and forest; values; awareness; improvement

Molla, M. B., Ikporukpo, C., & Olatubara, C. (2019). Evaluating Policy and Legal Frameworks of Urban Green Infrastructure Development in Ethiopia. *Journal of Environmental Assessment Policy and Management*, 21(03), 1950016.

Abstract

Policy monitoring and evaluation are important elements of the policy cycle, this help to initiate policy-makers to assess the proper implementation and adjust it as appropriate. This paper aims to evaluate the existing policy, strategies, and institutional arrangement on the development of urban green infrastructure in the three study areas; namely Hawassa, Wolayita Sodo, and Bodity town. Analyzing policy documents, key informant interview, and questionnaire survey were used to collect the required data. Descriptive statistics and policy analysis were also used to analyze the collected data from different sources. The study revealed that different strategies and standards were developed by the federal government, but it is not practically exercised at the regional and local level. The majority of government officials and experts agreed that existing policies and strategies related to UGI is not properly implemented. On the other hand, lack of policy and strategies are the major limitation in the development and management of UGI. Almost majority of the respondents confirmed that weak institutional arrangement has contributed to the poor implementation of UGI development. Lack of attention and awareness, the weak institutional arrangement is the main responsible factors for the absence of proper policy and poor implementation of strategies concerning UGI. Thus, actions needed for all the development of proper policies and strategies to improve UGI development.

Jegora, T., Asfaw, Z., & Anjulo, A. (2019). Woody Species Diversity and Management in Homegarden Agroforestry: The Case of Shashemene District, Ethiopia. *International Journal of Forestry Research*, 2019.

Abstract

The study was conducted in Shashemene district, Ethiopia. Management-related data were collected using informal and formal surveys. Woody species diversity and related parameters were collected from 60 households. Woody species with \geq 5 cm diameter at breast height (DBH) were measured and recorded and below 5 cm were counted and recorded in 10 m 10 m and 1 m 1 m plot, respectively. A total of 36 woody species were recorded, of which 58% were indigenous to the area. The overall mean number of woody species per plot was 3.13. Four woody species, namely, Cordia africana, Croton macrostachyus, Persea americana, and Catha edulis, showed highest importance value index. Farmers' preference ranks for selected woody species were recorded in order of Cordia africana, Eucalyptus camaldulensis, Croton macrostachyus, and Cupressus lusitanica, respectively. The similarity in woody species composition between the study villages ranged from 0.46 to 0.60. To sustain the management of woody species, farmers implemented pruning, thinning, composting, weeding, digging, and watering activities in the area. Garden availability and market and road accessibility are the major determinants of woody species in homegarden agroforestry. The study revealed woody species diversity, management practices implemented, and factors affecting woody species diversity management in homegarden agroforestry. Therefore, government should be worked on infrastructure, resource reallocation, and awareness creation in communities for the better improvement of species diversity and its sustainable management in homegarden agroforestry.

Fekadu, M., Feleke, S., & Bekele, T. (2019). Selection of seed oil biodiesel producing tree species, emission reduction and land suitability. *Agricultural Engineering International: CIGR Journal*, 21(4).

Abstract

Biodiesel is a renewable fuel, highly demanded globally at the beginning of the 21st Century because of depletion of fossil fuel reserve and environmental issues. In this paper, oil yielding tree species were reviewed and seeds of nine tree species were collected to select best seed oil producer and its emission reducing biodiesel and land suitability. Seed oil was extracted by mechanical, hydraulic and chemical methods and stored at room temperature (25°C) and deep freeze (-20°C). Then, the tree species with highest oil yield was further studied its biodiesel, estimated end use emission as rural household energy and its land suitability. Using hexane solvent, the oil yield was 12 (%, w/w) in Cordia africana to 50.2 (%, w/w) in Croton megalocarpus, which was 44.7% in hydraulic seed oil press. The biodiesel yield of C. megalocarpus was 82% to 100% (w/w), calorific value 38.8 to 43.2 MJ kg⁻¹, and flashpoint to 103°C. The biodiesel of C. megalocarpus contained esters like Octanoic acid methyl ester; and 9,12-Octadecadienoic acid (Z, Z)-, methyl esters. If a rural household uses biodiesel instead of firewood and kerosene, it is possible to reduce end use emission by 38.9% to 39.4%. As C. megalocarpus is a multipurpose tree species with potential source of cooking biodiesel fuel, it can be planted in some 34 million ha suitable land areas of Ethiopia.

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Wood, A., Tolera, M., Snell, M., O'Hara, P., & Hailu, A. (2019). Community forest management (CFM) in south-west Ethiopia: Maintaining forests, biodiversity and carbon stocks to support wild coffee conservation. *Global Environmental Change*, *59*, 101980.

Abstract

Community forest management (CFM) is increasingly recognised as a potentially effective way of maintaining forests, especially in the Global South. Despite the growing adoption of this approach, the results have been mixed and there is a need to explore both the ways in which a wider range of benefits can be obtained and how CFM can be implemented more effectively. New forest legislation on community forest management in the Southern Region of Ethiopia in 2012, alongside the development of a highly devolved method of CFM, provided a natural experiment

for testing the effectiveness of this method as a way of maintaining forest and also supporting biodiversity conservation and carbon storage. The specific circumstances and details of the methods applied also provided an opportunity to compare this approach against other experiences of CFM to assess factors seen to be influencing success. This study was undertaken in an area of montane forest in south-west Ethiopia, which includes some of the remaining stands of wild *Coffea arabica*, and so it also sought to create supportive conditions for the *in situ* conservation of the wild coffee. Analyses of this approach to CFM over the six years show that the loss of forest was reduced to 0.18% per annum in the CFM managed areas compared to 2.6% per annum in the non-CFM forest, while biodiversity, in terms of species diversity, richness and evenness of distribution, was maintained in the natural forest managed under CFM. Carbon storage also increased in the natural forest managed under CFM. While the long-term results will only be seen after several decades, the findings show that the use of a highly devolved form of CFM, responding to felt needs and building up a community of practice were some of the positive influences which helped in achieving multiple impacts towards sustainable forest management and wild coffee conservation.

Siyum, Z. G., Ayoade, J., Onilude, M., & Feyissa, M. T. (2019). Climate forcing of tree growth in dry Afromontane forest fragments of Northern Ethiopia: Evidence from multi-species responses. *Forest Ecosystems*, 6(1), 15.

Abstract

Background: Climate-induced challenge remains a growing concern in the dry tropics, threatening carbon sink potential of tropical dry forests. Hence, understanding their responses to the changing climate is of high priority to facilitate sustainable management of the remnant dry forests. In this study, we examined the long-term climate growth relations of main tree species in the remnant dry Afromontane forests in northern Ethiopia. The aim of this study was to assess the dendrochronological potential of selected dry Afromontane tree species and to study the influence of climatic variables (temperature and rainfall) on radial growth. It was hypothesized that there are potential tree species with discernible annual growth rings owing to the uni-modality of rainfall in the region. Ring width measurements were based on increment core samples and stem discs collected from a total of 106 trees belonging to three tree species (Juniperus procera, Olea europaea

subsp. cuspidate and Podocarpus falcatus). The collected samples were prepared, crossdated, and analyzed using standard dendrochronological methods. The formation of annual growth rings of the study species was verified based on successful crossdatability and by correlating tree-ring widths with rainfall. Results: The results showed that all the sampled tree species form distinct growth boundaries though differences in the distinctiveness were observed among the species. Positive and significant correlations were found between the tree-ring widths and rainfall, implying that rainfall plays a vital role in determining tree growth in the region. The study confirmed the formation of annual growth rings through successful crossdating, thus highlighted the potential applicability of dendroclimatic studies in the region. Conclusions: Overall, the results proved the strong linkage between tree-ring chronologies and climate variability in the study region, which further strengthens the potential of dendrochronological studies developing in Ethiopia, and also has great implications for further paleo-climatic reconstructions and in the restoration of degraded lands. Further knowledge on the growth characteristics of tree species from the region is required to improve the network of tree-ring data and quality of the chronology so as to successfully reconstruct historic environmental changes.

Keywords: Climate-growth relationship, Climate change, Dry Afromontane forest, Restoration,

Bongers, F., Groenendijk, P., Bekele, T., Birhane, E., Damtew, A., Decuyper, M., Eshete, A., Gezahgne, A., Girma, A., & Khamis, M. A. (2019). Frankincense in peril. *Nature Sustainability*, *2*(7), 602–610.

Abstract

The harvest of plant parts and exudates from wild populations contributes to the income, food security and livelihoods of many millions of people worldwide. Frankincense, an aromatic resin sourced from natural populations of *Boswellia* trees and shrubs, has been cherished by world societies for centuries. *Boswellia* populations are threatened by over-exploitation and ecosystem degradation, jeopardizing future resin production. Here, we reveal evidence of population collapse of *B. papyrifera*—now the main source of frankincense—throughout its geographic range. Using inventories of 23 populations consisting of 21,786 trees, growth-ring data from 202 trees and demographic models on the basis of 7,246 trees, we find that over 75% of studied populations lack small trees, natural regeneration has been absent for decades, and projected frankincense

production will be halved in 20 yr. These changes are caused by increased human population pressure on *Boswellia* woodlands through cattle grazing, frequent burns and reckless tapping. A literature review showed that other *Boswellia* species experience similar threats. Populations can be restored by establishing cattle exclosures and fire-breaks, and by planting trees and tapping trees more carefully. Concerted conservation and restoration efforts are urgently needed to secure the long-term availability of this iconic product.

Gebremariam, S. N., & Marchetti, J. M. (2019b). The effect of economic variables on a biorefinery for biodiesel production using calcium oxide catalyst. *Biofuels, Bioproducts and Biorefining*, *13*(5), 1333–1346.

Abstract

This study investigates the effect of market variables on biodiesel production and considers a calcium oxide catalyzed transesterification process. A conceptual process simulation of a plant using Super Pro software was used to vary the economic scenarios and to evaluate the effects of selected variables such as prices of biodiesel, glycerol, oil, alcohol, catalyst, equipment maintenance, labor, and tax variation. Changing the values of these variables led to large effects on the overall economics of the production process. Oil purchasing cost exerted a larger influence on the economic outcome, with an approximately 73% decrease in net present value (NPV) for a 22% increase in the oil purchasing cost. Under optimum conditions the process would be profitable for oil costs below 590US\$ ton⁻¹. Varying the equipment maintenance costs produced a smaller effect, which could allow the amount of cost allocated for routine maintenance activities to be increased to sustain the productivity of the process. The study could also provide cutoff values for each variable for economic feasibility of the process at the given market scenario. © 2019 The Authors. *Biofuels, Bioproducts and Biorefining* published by Society of Chemical Industry and John Wiley & Sons, Ltd.

Gebremariam, S. N., & Marchetti, J. M. (2019a). Techno-economic performance of a biorefinery for the production of fuel-grade biofuel using a green catalyst. *Biofuels, Bioproducts and Biorefining*, *13*(4), 936–949.

Abstract

There are different technologies for biodiesel production, each having its benefits and drawbacks depending on the type of feedstock and catalyst used. In this study, the techno-economic performances of four catalyst technologies were investigated. The catalysts were bulk calcium oxide (CaO), enzyme, nano-calcium oxide, and ionic liquid. The study was mainly based on process simulations designed using Aspen Plus and SuperPro software. The quantity and quality of biodiesel and glycerol, as well as the amount of biodiesel per amount of feedstock, were the parameters to evaluate technical performances. The parameters for economic performances were total investment cost, unit production cost, net present value (NPV), internal return rate (IRR), and return over investment (ROI). Technically, all the studied options provided fuel quality biodiesel and high purity glycerol. However, under the assumed market scenario, the process using bulk CaO catalyst was more economically feasible and tolerable to the change in market values of major inputs and outputs. On the contrary, the enzyme catalyst option was very expensive and economically infeasible for all considered ranges of cost of feedstock and product. The result of this study could be used as a basis to do detail estimates for the practical implementation of the efficient process.

Keywords: Biodiesel; CaO catalyst; Nano-catalyst; Ionic liquid catalyst; Economic analysis

College of Medicine and Health Science

Aseffa, A., Abate, E., Seyoum, B., Kassa, T., Abebe, T., Amsalu, A., Bitew, A., Alemayehu, T., Ayenew, Z., & Gizachew, Z. (2019). INVESTIGATIONS ON ANTIMICROBIAL RESISTANCE: CONTRIBUTIONS OF A CLINICAL RESEARCH NETWORK. Ethiopian *Medical Journal*.

Introduction

Antimicrobial resistance (AMR) has recently gained global recognition as a priority health care challenge. There is growing consensus that at the rate resistance is developing against existing drugs, and in the face of prevailing deficit in new therapeutic options, emergence and spread of untreatable infections "a post antibiotic era" is a "very real possibility" (1); with a strong potential to reverse the gains of modern medicine in the last century. As such, AMR has been dubbed a global health security threat.

Most antibiotics are prescribed on the basis of collective experience without accurate knowledge of the microbe or its susceptibility to antibiotics. The collective experience will however need to be calibrated based on current data for this approach to sustain. Otherwise, the prevalent practice of empiric treatment that is not further adjusted based on laboratory culture and sensitivity data contributes to poor treatment success and adds to avoidable adverse events. Often, the most potent, reserve or broad spectrum antibacterial agents are prescribed as a first resort exposing them to early loss of potency with emerging resistance. The secondary effects of depleted drug choices mean that mortality from surgical interventions, cancer chemotherapy, organ transplantation and other services that rely on antibiotic support would rise. The combined effect at national level is higher health care cost as more treatments fail, more toxic alternatives are applied and drug import costs escalate.

There are obvious advantages of empiric therapy as extensive microbiological diagnostics are often not feasible or available on time, even in hospital settings. The rapid spread of drug resistance is forcing antibiotic treatment guidelines to become more and more tailor made with due consideration of the prevailing antibacterial resistance situation in the region or in the health facility and the clinical condition of the patient.

Nowadays, clinicians are finding it increasingly difficult to reliably treat common bacterial infections. In the past, antibacterial resistance (ABR) was mainly seen in hospitals but today community acquired infections with resistant bacteria are increasingly frequent. ABR has reached "alarming levels" globally but the true magnitude is often difficult to assess due to significant gaps in surveillance, lack of standards in methodology and difficulties in generalizability of small data sets and sample sizes. Different antibiotic resistance patterns of bacteria are currently characterized based on an emerging consensus on terminology. Although these classifications are developed for the purposes of epidemiological monitoring they are also valuable for clinical purposes as well. The definition is based on standard sensitivity testing using clinical cut off points against an antibiotic. Antimicrobial catego-ries were constructed for organisms or organism groups. An indicator antibiotic can be tested as representative of a category. "A bacterial isolate is considered resistant to an antimicrobial category when it is 'non-susceptible to at least one agent in a category'" (2) due to acquired resistance. Multidrug resistance (MDR) is defined as non-susceptibility to at least one agent in three or more antimicrobial categories. Extensive drug resistance (XDR) is defined as non-susceptibility to at least one agent in all but two or fewer antimicrobial categories (i.e. bacterial isolates remain susceptible to only one or two categories). Pandrug resistance (PDR) is defined as non-susceptibility to all agents in all antimicrobial categories (i.e. no agents tested as susceptible for that organism) (2). Seventeen antimicrobial categories and agents have been described to define MDR, XDR and PDR for Entero-bacteriaceae and the same number for S aureus in the interim list proposed by the joint initiative of the European and American Centers for Disease Control and Prevention (CDC) (2).

Deressa, A. T., & Zeru, G. (2019). Work motivation and its effects on organizational performance: The case of nurses in Hawassa public and private hospitals: Mixed method study approach. *BMC Research Notes*, *12*(1), 213.

Abstract

Objective

The main objective of the study was to assess level of motivation, how nurses perceived work motivation and its effects on organizational performance among nurses working in Hawassa public and private hospitals.

Results

It was found that majority (64.1%) of the nurses perceived motivation as motivators. Getting prospective encouragement, recognition and financial incentives were the main descriptions the nurses gave to motivation. Increased work performance, job satisfaction, good team spirit, patient satisfaction and job attachment were the reported effects of nurses' motivation.

Awol, N., Nigusse, D., & Ali, M. (2019). Prevalence and antimicrobial susceptibility profile of Salmonella and Shigella among food handlers working in food establishment at Hawassa city, Southern Ethiopia. *BMC Research Notes*, *12*(1), 712.

Abstract

Objective: The aim of this study was to determine the prevalence of Salmonella and Shigella, antibiotic susceptibility profile and associated factors among food handlers working in food establishment from June to December 2018 at Hawassa city, Southern Ethiopia.

Results: Out of the 236 food handlers screened for stool culture, 5 (2.12%) were positive for Salmonella species and all of them were negative for Shigella species. All Salmonella species isolated were susceptible to ciprofloxacin and ceftriaxone but among the five isolated Salmonella species, 4 (80%), 3 (60%), 2 (40%), 2 (40%), and 2 (40%) were resistant to tetracycline, ampicillin, amoxicillin-clavulanic acid, cotrimoxazole, and chloramphenicol respectively. Only food handlers hand washing the habit after toilet had a significant association with the prevalence of Salmonella species (P = 0.03).

Keywords: Antibiotic susceptibility; Ethiopia; Food handlers; Hawassa; Prevalence; Salmonella; Shigella.

Hibstu, D., Abebo, T. A., Tesfaye, D. J., Wolde, Y., & Bago, B. (2019). Unmet Need for Family Planning and Associated Factors among Married Women of Reproductive Age Group in Hawassa Zuria District, Sidama Zone, South Ethiopia. 671–979.

Abstract

Background: In spite of positive trends in Ethiopia in the last decade, demand for family planning exceeds uptake of contraceptive methods where 75% of married women wish to delay childbirth for at least two years or totally stop childbearing. The aim of this study was to assess magnitude of unmet need for family planning and its associated factors among married women of reproductive age group in Hawassa Zuria District, Southern Ethiopia. Methods: Community-based cross-sectional study was conducted from March 15 - 30, 2017. Data on married reproductive women were collected using a pre-tested and interviewer administered structured questionnaire from 485 women using systematic random sampling technique. Bivariate and multivariable logistic regression was done to identify potential predictors of the outcome variable. Result: One

in five, 92 (19.1%; 95% CI: 15.6 - 22.7) women had unmet need for contraceptive. Maternal occupation (Adjusted odd Ratio (AOR) = 1.90, CI: 1.07, 3.37) and service decision maker (AOR = 2.89, CI: 1.59, 5.24), age at first pregnancy (AOR = 0.41, CI: 0.20, 0.81) and time taken to health facilities on foot (AOR = 0.49, CI: 0.28, 0.85) were identified factors of unmet need for family planning.

Conclusion: Unmet need for family planning was still high in the study area. Maternal occupation, service decision maker, number of alive births, age at first pregnancy and time taken to health facility were named as independent factors of unmet need in family planning. Decreasing unemployment, involving partners/husbands in family planning decision making, awareness on negative results of teenage pregnancy demand continuous effort in the society

Keywords: Ethiopia; Hawassa Zuria District; Married Reproductive Age Group: Unmet Need Negari, K. G., Rodamo, K. M., & Hirigo, A. T. (2019). Factors associated with the length of stay in emergency departments in Southern-Ethiopia. *BMC Research Notes*, *12*(1), 239.

Abstract

Objectives

This cross-sectional study was conducted on 399 patients at Hawassa University Comprehensive Specialized Hospital from February 15 to March 30/2018 to assess the length of stay (LOS) and its associated factors in emergency departments (EDs).

Result

About 91.5% patients were stayed in the EDs for greater than 24 h in different reasons. Inadequacy of beds in inpatient wards, overcrowding, absence of different laboratory test profiles and delay in radiological services were showed a significant differences in LOS greater than 24 h when compared to $LOS \le 24$ h in EDs (p < 0.05 for all). In addition, admission beds [adjusted odds ratio: 8.7 (95% CI 3.2–23.2)]; overcrowding [adjusted odds ratio: 3.6 (95% CI 1.6–8.3)]; laboratory test profiles [adjusted odds ratio: 5.1 (95% CI 1.9–14.1)], and radiology services [adjusted odds ratio: 3.7 (95% CI 1.5–9.2)] were significantly and positively associated with LOS greater than 24 h in EDs. Further, a significant proportion of patients were stayed for unnecessary extended length of time in EDs due to different factors. Therefore, the commitment of organization is crucial to provide sufficient number of admission beds, to scale-up laboratory test profiles and to decrease radiology service turn-around time in order to improve LOS in EDs.

Alemayehu, T., Ali, M., Mitiku, E., & Hailemariam, M. (2019). The burden of antimicrobial resistance at tertiary care hospital, southern Ethiopia: A three years' retrospective study. *BMC Infectious Diseases*, *19*(1), 585.

Abstract

Background

Antibiotic resistance is a worldwide problem that crosses international boundaries and spread between continents easily. Hence, information on the existence of the causative microorganisms and their susceptibility to commonly used antibiotics are essential to enhance therapeutic outcome. Method

A cross-sectional study was conducted retrospectively at Hawassa University Comprehensive Specialized Hospital. The culture and antibiotic sensitivity data of the isolates were collected from the record books of the microbiology unit for the study period after official permission obtained from the institutional review board. The data entered and analyzed using statistical package for social science software version 20.

Result

A total of 693 bacteria were retrieved, of these 435(62.77%) were gram-negative and the rest 258(37.23%) were gram-positive. Most of the isolates were from a urine sample. Among gram positives isolates, *S. aureus* and from gram negatives *Klebsiella spp* are the most recurrent isolate. Almost a remarkable resistance was observed to most of the antibiotics mainly, penicillin G (81.8%) and cotrimoxazole (81.1%), for gram-positive bacteria. The gram-negative bacteria also show resistance to ampicillin (92.5%), tetracycline (85%) and cotrimoxazole (93.1%).

Conclusions

Nearly all isolate show substantial rates of resistance to most of the antibiotic that is frequently used in the study area. As already known we want to emphases on the importance of performing continuous monitoring of drug susceptibility to help the empirical treatment of bacterial agents to a health professional in the region. In addition, this data might help policymakers to control of antibiotics resistance.

Alemayehu, T., Tadesse, E., Ayalew, S., Nigusse, B., Yeshitila, B., Amsalu, A., & Assefa, A. (2019). HIGH BURDEN OF NOSOCOMIAL INFECTIONS CAUSED BY MULTI-DRUG RE-SISTANT PATHOGENS IN PEDIATRIC PATIENTS AT HAWASSA UNIVERSITY COMPREHENSIVE SPECIALIZED HOSPITAL.

Abstract

Background: Pediatric patients are at increased risk of nosocomial infections (NIs) with multidrugresistant (MDR) pathogens, which are more prevalent in the hospital environment. The aim of this study was to determine the prevalence of NIs, antibiotic resistance pattern of bacterial isolates and associated factors in pediatric patients at Hawassa University Comprehensive Specialized Hospital.Methods: A cross sectional study was conducted from March to August, 2016. Socio-demographic and clinical data were collected among patients clinically suspected of developing NI using a structured questionnaire. Bacterial identification and antimicrobial susceptibility test were done with standard microbiological methods. Data were analyzed with SPSS version 20 and p value < 0.05 was considered as statistically significant. Conclusion: The high prevalence of NIs with MDR bacteria suggests the need for proper implementation of the NI prevention and control measures.

Keywords: Nosocomial infection, Multi-drugresistance, Pediatrics, Ethiopia LESS.

Gebre, B., Alemayehu, T., Girma, M., Ayalew, F., Tadesse, B. T., & Shemelis, T. (2019). Cryptosporidiosis And Other Intestinal Parasitic Infections And Concomitant Threats Among HIV-Infected Children In Southern Ethiopia Receiving First-Line Antiretroviral Therapy. *Hiv/Aids (Auckland, NZ)*, *11*, 299.

Abstract

Background

Children infected with human immunodeficiency virus (HIV) are at high risk of acquiring intestinal parasitic infections. This study aimed to determine the magnitude of *Cryptosporidium* and other intestinal parasitic infections and concomitant threats among HIV-infected children.

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Methods

A hospital-based cross-sectional study was carried out at three antiretroviral therapy clinics in southern Ethiopia from February 2016 to June 2017 in 384 HIV positive children. Sociodemographic and clinical data were collected using structured questionnaires. Direct stool microscopic examination and modified Zeihl–Neelsen staining technique to identify parasites. Chi-square test was conducted to determine the real predictors of the infection. Significant association was considered when p-value <0.05 at 95% CI.

Results

The overall magnitude of intestinal parasitic infections among the study population was 16.9% (95% CI: 13.0–20.8%). The most predominant parasitic infections were *Cryptosporidium* spp. (9.6%) and the least was *Taenia* spp. (0.78%). Diarrheal status (χ^2 =7.653, df=2, p=0.022) was detected to be the only significant associated variable.

Conclusion

Cryptosporidium infection was found to be the most common intestinal parasitosis among HIVinfected children. Routine screening service for *Cryptosporidium* and other intestinal parasites is important in the clinical management of HIV-infected children.

Keywords: Intestinal parasites, Cryptosporidium, HIV/AIDS, Southern Ethiopia

Duko, B., Ayano, G., & Bedaso, A. (2019). Depression among pregnant women and associated factors in Hawassa city, Ethiopia: An institution-based cross-sectional study. *Reproductive Health, Extra Publisher: Springer,16 (1), 1-6.*

Abstract

Background

Depression is the most prevalent psychiatric disorder during pregnancy. It is not only common and chronic among women throughout the world but also principal source of disability in pregnant women. The scarce information and limited attention to the problem might aggravate the consequence of the problem and can limit the intervention to be taken. The objective of the study was to assess the prevalence and factors associated with depression among pregnant women in public health institutions, Hawassa, Ethiopia.

Methods

Institution based cross sectional study was conducted in May to July 2017. Pregnant women were selected by using systematic sampling technique. Data were collected through face-to-face interviews on socio-demographic, obstetric, psychosocial characteristics and depressive symptoms. Edinburgh Postnatal Depression Scale (EPDS) and Oslo Social Support Scale (OSS-3) were used to asses' depressive symptoms and social support respectively. Descriptive and logistic regression analyses were carried out.

Results

The mean age of the respondents was $23.82 \pm (SD = 6.65)$ years. The prevalence of antenatal depression was 21.5%. When we adjusted for the effect of potential confounding variables, being in age group of 20–30 years [AOR = 5.85 (95% CI: (3.70, 10.14)], current pregnancy complication [AOR = 4.98 (95% CI: (3.01, 10.37)], unplanned pregnancy [AOR = 7.12, (95% CI: (3.12, 9.63)], categories of stressors (LTE) Health risk [AOR = 1.76, (95% CI: (1.01, 3.22)], previous history of depression [AOR = 2.76 (95% CI: (1.94, 6.75)], history of abortion [AOR = 1.52, (95% CI:1.04, 5.09)], history of still birth [AOR = 1.18, (95% CI: 1.08, 2.91)], poor social support [AOR = 2.14, (95% CI: 1.49, 3.11)] and poor baby father support [AOR = 3.21 (95% CI:1.93, 6.71)] were significantly associated with antenatal depression.

Conclusion

For early detection and appropriate intervention, antenatal clinics should develop screening tools for depression during the routine antenatal care.

Bedaso, A., & Ayalew, M. (2019). Preoperative anxiety among adult patients undergoing elective surgery: A prospective survey at a general hospital in Ethiopia. *Patient Safety in Surgery*, *13*(1), 18.

Abstract

Background

Major life changes are among factors that cause anxiety, and one of these changes is surgery. Hospitalization, regardless of disease, is known to provoke anxiety in the patient admitted for surgery. Anxiety is an unpleasant disturbing experience that involves way of thinking of tension, apprehension, uneasiness and high autonomic activity. Patients with high levels of anxiety require higher doses of anesthetic induction agents and recover poorly. The objective of this study was to investigate the prevalence of preoperative anxiety and its predictors among adult patients scheduled for elective surgery.

Methodology

Institutional based cross sectional study was conducted using interviewer administered structured questionnaire in Yirgalem zonal hospital in Ethiopia from November 1, to December 30, 2018 on 407 patients scheduled for elective surgery. The study included all patients with age greater than 18 years who were undergoing surgery. Patients with known anxiety disorder and unable to communicate were excluded from the study. State and trait anxiety inventory (STAI) measurement scale was used to assess preoperative anxiety. Statistical analysis was performed using SPSS version 22. Binary logistic regression analysis was performed to determine the predictors of preoperative anxiety. The strength of the association was presented using AOR with 95% confidence interval and *p*-value < 0.05 was considered as statistically significant.

Results

Among a total of 402 patients enrolled in the study 228 (56.7%) were male. The prevalence of preoperative anxiety among scheduled patients for elective surgery was 47.0%. Having strong social support (AOR = .16 CI = 0.07, 0.34), harm from doctor or nurse mistake (AOR = 5.03, CI = 2.85, 8.89), unexpected result of operation (AOR = 3.03, CI = 1.73, 5.19), unable to recover (AOR = 2.96, CI = 1.18, 4.87), and need of blood transfusion (AOR = 2.76, CI = 1.65, 4.62) were significantly associated with preoperative anxiety.

Conclusion

In the current study the prevalence of preoperative anxiety was high (47%). Having strong social support, unexpected result of operation, harm from doctor or nurse mistake, need of blood transfusion, and unable to recover were found to be statistically significant for preoperative anxiety. Patients need to be assessed regularly for anxiety during the preoperative visit.

Bedaso, A., Gebrie, M., Deribe, B., Ayalew, M., & Duko, B. (2019). Knowledge and practice on adequate sunlight exposure of infants among mothers attending EPI unit of Aleta Wondo Health Center, SNNPR, Ethiopia. *BMC Research Notes*, *12*(1), 183.

Abstract

Objective

The main objective of this study was to assess knowledge and practice of adequate sunlight exposure of infants among mothers attending EPI unit at Aleta Wondo Health Center, Sidama zone, SNNPR, Ethiopia. Institutional based descriptive cross sectional study design was used. 313 mothers who had under 1 year child and immunization follow-up were selected by simple random sampling technique using immunization registration book as sampling frame.

Result

Out of 313 respondents identified for the study 98.03% (n = 307) were responded for the interview. From the total respondents 279 (90.9%) of respondents exposed their infants to sunlight but only 62 (22%) of them exposed adequately. From 307 mothers, 191 (62.2%) are knowledgeable about sunlight exposure and 91 (32.6%) of mothers had good practice of exposing their infants to sunlight.

Bedaso, A., Oltaye, Z., Geja, E., & Ayalew, M. (2019). Diabetic ketoacidosis among adult patients with diabetes mellitus admitted to emergency unit of Hawassa university comprehensive specialized hospital. *BMC Research Notes*, *12*(1), 137.

Abstract

Objective

This study was aimed to assess the prevalence and associated factors of diabetic ketoacidosis among adult patients admitted in emergency department of Hawassa university comprehensive specialized hospital. An institution based retrospective cross-sectional study design was conducted among 195 adult patients aged 16 years and above with known or previously unknown diabetes cases presented in the emergency unit.

Result

In our study from the total 195 patients medical record reviewed 78 (40%) developed DKA. Out of the total reviewed medical record 55 (28.2%) and 23 (11.8%) were with type-1 and type 2

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diabetes mellitus respectively. From acute complication of diabetes, diabetic ketoacidosis was a leading cause 78 (77%) followed by hypoglycemia 14 (14%) and hyperosmolar hyperglycemic state (9%). During multiple logistic regression analysis age and hypertension were found to have significant association with diabetic ketoacidosis.

Bedaso, A., Kebede, E., & Adamu, T. (2019). Assessment of skin-to-skin contact (SSC) during the postpartum stay and its determinant factors among mothers at public health institutions in Ethiopia. *BMC Research Notes*, *12*(1), 136.

Abstract

Objective

The study aimed at assessing skin-to-skin contact (SSC) during the postpartum stay and its determinant factors among mothers at public health institutions in Ethiopia.

Result

A total of 384 mothers-indexed newborns admitted in postnatal wards were interviewed. The prevalence of mothers' SSC practice to their newborns with in the first 1 h during the postpartum stay was 28.1%. Mothers education (AOR = 18.23 [95% CI 5.26, 63.52]), and number of ANC visits (AOR = 8.55 [95% CI 1.05, 69.54]) were independently associated with SSC practice of mothers to their infants.

Duko, B., Bedaso, A., Ayano, G., & Yohannis, Z. (2019). Perceived Stigma and Associated Factors among Patient with Tuberculosis, Wolaita Sodo, Ethiopia: Cross-Sectional Study. *Tuberculosis Research and Treatment*, 2019.

Abstract

Background. Tuberculosis is a historically stigmatized disease and the stigma associated with it affects the institution, community, and interpersonal factors. Therefore, understanding tuberculosis-related perceived stigma has importance in improving quality of the patients. Objective. The aim of this study was to assess prevalence and factors associated with

perceived stigma among patients with tuberculosis attending Wolaita Sodo University Referral Hospital, Ethiopia. Methods. Institution based cross-sectional study was conducted among a total of 417 tuberculosis patients who had treatment follow-up at TB clinics and were recruited for the study. Systematic random sampling technique was used to recruit study participants. A 12-item perceived TB stigma scale was used to assess tuberculosis-related perceived stigma. In addition, Oslo social support scale was used to assess social support related factors. Results. Prevalence of tuberculosis-related perceived stigma by using perceived tuberculosis stigma scale was 42.4%. Patients who had pulmonary TB [AOR=2.49, (95% CI: 1.24, 4.87)], being intensive phase category [AOR=1.42, (95% CI: 1.19, 2.58)], TB/HIV coinfection [AOR= 3.54, (95% CI: 1.37, 9.12)], poor social support [AOR=2.45, (95% CI: 1.18, 5.09)], and using substance (alcohol, khat and cigarette) [AOR=1.78, (95% CI: 1.28, 3.17)] were more likely to have perceived TB stigma when compared to their counter parts. Conclusion. Health education programs should be conducted to reduce TB stigma and improve patients' compliance.

Yeneabat, T., Adugna, H., Asmamaw, T., Wubetu, M., Admas, M., Hailu, G., Bedaso, A., & Amare, T. (2019). Maternal dietary diversity and micronutrient adequacy during pregnancy and related factors in East Gojjam Zone, Northwest Ethiopia, 2016. *BMC Pregnancy and Childbirth*, *19*(1), 1–9.

Abstract

Background

Monotonous and less diversified diets are associated with micronutrient deficiency. Evidence on maternal dietary intakes during pregnancy is essential to achieve the 2025 global nutrition target and reduce maternal and child mortalities. This study assessed pregnant women's dietary diversity and identified factors associated with inadequate dietary diversity in East Gojjam Zone. Methods

We conducted a community-based cross-sectional study between April and June 2016. Eight hundred thirty-four pregnant women were randomly sampled. The Women Dietary Diversity Score tool developed by the Food and Agricultural Organization (FAO) and Food and Nutrition Technical Assistance (FANTA) was used. Data were entered into EpiData with double entry verification, and analysis was done using IBM SPSS version 20. Level of significance was set

to P < 0.05 with 95% confidence interval (CI) to identify the independent factors associated with inadequate dietary diversity.

Results

The mean (±SD) dietary diversity score was 3.68 (±2.10). Inadequate dietary diversity was prevalent in 55% [95% CI (52.3–59.3%)] of pregnant women, or indirectly micronutrient was inadequate in more than half of the pregnant women. Commonly consumed dietary groups were legumes, nuts, and seeds (85.5%) followed by starchy staples (64.7%). Inadequate dietary diversity was higher among non-educated [Adjusted Odds Ratio (AOR) = 7.30, 95% CI (2.35–22.68)] compared to college and above completed women. Wealth index had significant association with dietary diversity, in which women in the poorest [AOR = 8.83, 95% CI, (1.60–48.61)], poorer [AOR = 6.34, 95% CI (1.16–34.65)], poor [AOR = 8.46, 95% CI (1.56–45.70)], and richer [AOR = 6.57, 95% CI (2.16–20.01)] had higher odds of inadequate dietary diversity. Those who had not received dietary counseling had three folds [AOR = 3.31, 95% CI (1.49–7.35)] of inadequate dietary diversity compared to their counterparts. Less likelihood of inadequate dietary diversity was among women with an increased meal frequency [AOR = 0.53, 95% CI (0.38–0.74)]. Conclusion

Consumption of less diversified food during pregnancy is common in the study area. Adequacy of micronutrients is insufficient for more than half of the studied pregnant women. We conclude that being non-educated affects pregnant women to depend on less diversified diet. Providing dietary counseling during pregnancy can improve nutritional practice for pregnant women.

Duko, B., Tadesse, F., & Oltaye, Z. (2019). Patterns of road traffic injury and potential consequences among patients visiting Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia. *BMC Research Notes*, *12*(1), 186.

Abstract

Objective: Road trafc injury (RTI) is the leading cause of death among aged 15–29 years, although low and middle income countries only have half of the vehicles, they have 80% of road trafc related death. This study aimed to assess the probability of road trafc injury occurrence and potential consequences among patient visiting at emergency department of Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia. Retrospective cross-sectional study was conducted from March 8 to April 6/2018 among 350 patients who were recruited using systematic random sampling techniques. Binary logistic regression analysis was used for data analysis. Results: A total of 350 patients medical charts were reviewed at emergency department. The prevalence of road traffc accident was 40.9%. Being male (AOR=1.84: 95% CI 1.11–3.09), being in age group of 20–29 (AOR=2.58: 95% CI 1.14–5.84) and being in urban area of residence (AOR=2.46; 95% CI 1.51–4.02) were significantly associated with road trafc accident. Conducting further research on road trafc injury and risk factors recommended.

Keywords: Prevalence, Road trafc accident, Emergency department, Ethiopia.

Duko, B., Toma, A., & Abraham, Y. (2019b). Prevalence and correlates of common mental disorder among HIV patients attending antiretroviral therapy clinics in Hawassa City, Ethiopia. *Annals of General Psychiatry*, *18*(1), 17.

Abstract

Background

Common mental disorder (CMD) is a group of disorders which include depression, anxiety and somatoform disorders with significant contributions to the burden of disease. It can lead to high social, economic and individual costs because it accounts for one-third of the days missed at work and a fifth of all primary health-care appointment. This study was aimed to assess the prevalence and factors associated with common mental disorders among HIV patients in Hawassa City, Ethiopia, 2018.

Methods

The cross-sectional study was conducted at Hawassa University Comprehensive Specialized Hospital, Ethiopia, among 294 HIV patients who were recruited through systematic sampling techniques. Common mental disorder was assessed through face to face interviews by trained professional psychiatry nurses using a WHO-validated 20-item version of the Self-Reporting Questionnaire (SRQ-20). Other possible risk factors of CMD were assessed using a structured questionnaire, perceived HIV stigma scale and Oslo Item 3 Social Support Scale. Results

A total of 294 HIV patients participated in the study giving a response rate of 98.7%. The mean $(\pm SD)$ age of the respondents was 35.86 years (± 9.23) . Among the study participants, being female [AOR = 1.25, (95% CI 1.01, 2.43)], being widowed [AOR = 1.99, (95% CI 1.51, 5.28)], having poor social support [AOR = 2.44, (95% CI 1.33, 4.51)], having previous history of psychiatric illness [AOR = 3.83, (95% CI 1.89, 9.33)] and HIV-related perceived stigma [AOR = 1.97, (95% CI 1.63, 2.89)] were more likely to have common mental disorder when compared to their counterparts.

Conclusion

The prevalence of common mental disorder was high. The Ministry of Health should develop a guideline which helps to screen and treat common mental disorders at ART clinics. Further interventional research on risk factors of common mental disorder should be conducted to strengthen and broaden the current findings.

Ejigu, K., Haji, Y., Toma, A., & Tadesse, B. T. (2019). Factors associated with scabies outbreaks in primary schools in Ethiopia: A case-control study. *Research and Reports in Tropical Medicine*, 10, 119.

Abstract

Background

Scabies is a neglected tropical disease affecting more than 200 million people worldwide every year. Scabies in school adolescents and young adults could affect their school performance. The current study investigates the factors associated with an outbreak of scabies at primary schools in southern Ethiopia.

Method

A team of health professionals investigated an outbreak of scabies that occurred in primary schools from May 1 to 30, 2018. An unmatched case–control study was employed to assess factors which predisposed for the scabies outbreak. Cases of scabies were individuals having a skin lesion compatible with the WHO case definitions of scabies. Controls were from the same locality with no skin lesions. Data on sociodemographic and behavioral variables were collected using questionnaires. Data on clinical presentations of scabies among cases were recorded by two trained and experienced health professionals. Factors associated with scabies were assessed using

bivariate and multivariate logistic regression, and strength of association was described using odds ratio (OR) and 95% confidence intervals (CIs).

Results

A total of 711 (237 cases and 474 controls) study subjects participated in the study. The mean age of study participants was 17.56 \pm 2.66 years. Poor knowledge about scabies, adjusted odds ratio (AOR)=4.32 (95% CI: 2.93, 6.36); male sex, AOR=2.69 (95% CI: 1.82, 3.96); and parental illiteracy, AOR =3.49 (95% CI: 2.06, 5.94) predicted scabies infestation. Additionally, socioeconomic variables like sharing clothes/beds or contact with others, AOR=3.12 (95% CI: 2.12, 4.59); low household annual income, AOR=2.13 (95% CI: 1.32, 3.44); and family size greater than five, AOR=1.77 (95% CI: 1.04, 3.01) were significantly associated with scabies infestation. Inaccessibility and poor utilization of water, AOR=1.64 (95% CI: 1.12, 2.40) and poor personal hygiene, AOR=1.69 (95% CI: 1.14, 2.51) were also factors independently associated with scabies.

Conclusion

Modifiable risk factors such as personal hygiene and literacy level were found to be independent predictors of scabies infestation. Access to and utilization of water were also important predictors. Strategies for poverty alleviation and awareness creation on personal hygiene and efficient use of water are recommended for effective prevention of scabies infestation in closed institutions.

Keywords: Scabies outbreak, Primary school, Ethiopia

Duko, B., Toma, A., & Abraham, Y. (2019a). Alcohol use disorder and associated factors among individuals living with HIV in Hawassa City, Ethiopia: A facility based cross-sectional study. *Substance Abuse Treatment, Prevention, and Policy*, *14*(1), 22.

Abstract

Background

Individuals living with HIV/AIDS with co-occurring harmful alcohol use may require specialized intervention or even multi-disciplinary team follow-up and management. This study was aimed to assess alcohol use disorder and associated factors among people living with HIV/AIDS in Hawassa city, Ethiopia, 2019.

Methods

A facility based cross-sectional study was conducted among 195 people living with HIV/AIDS who had follow-up visit at Hawassa University Comprehensive Specialized hospital. A systematic sampling technique was used to recruit the study participants. Alcohol used disorders identification test (AUDIT) was used to measure alcohol consumption, drinking behaviors, and alcohol-related problems. The binary logistic regression model was used to see the association between alcohol use disorder (AUD) and the independent variables. The strength of association was measured by odds ratios with 95% confidence intervals. Statistical significance declared at P < 0.05. Results

The mean age of the study participants was 29.88 (\pm SD = 10.89) years. The magnitude of alcohol use disorder among people living with HIV/AIDS was 31.8%. Being male [AOR = 2.43, (95% CI: 1.76, 5.76)], having poor social support [AOR = 1.34, (95% CI: 1.12, 6.73)], being medication non-adherent [AOR = 1.78, (95% CI: 1.33, 6.79)], current khat chewing [AOR = 1.67, (95% CI: 1.16, 5.45)] and current cigarette smoking [AOR = 3.76, (95% CI: 2.16, 7.54)] had statistically significant association with alcohol use disorder.

Conclusion

In the current study, magnitude of alcohol use disorder among people living with HIV was high and, calls for integrating services provided to HIV patients in HIV care and treatment clinic which enhances timely detection and management of AUD cases. This also alerts the stakeholders in HIV prevention and control programs to invest a greater efforts to retain patients in addiction treatment and rehabilitation centers. Lastly, appropriate screening and health education on consequences of alcohol use disorder is warranted.

Duko, B., Toma, A., Asnake, S., & Abraham, Y. (2019). Depression, Anxiety and Their Correlates Among Patients With HIV in South Ethiopia: An Institution-Based Cross-Sectional Study. *Frontiers in Psychiatry*, *10*, 290.

Abstract

Background: Depressive and anxious symptoms are more regularly seen in HIV-infected people than in the general population. This investigation planned to evaluate the magnitude and factors related to depressive and anxiety symptoms among HIV patients in South Ethiopia, 2018.

Methods: This was an institution-based cross-sectional study directed among 363 HIV-infected individuals who had a customary visit at Hawassa University Comprehensive Specialized Hospital and Yirgalem Hospital, Ethiopia, who were incorporated into the study through systematic sampling techniques. The hospital anxiety and depression scale (HADS) was utilized to take a look at anxious and depressive symptoms.

Results: The mean age of the respondents was 37.66 years (SD ± 10.03). The prevalence of depression and anxiety were 32.0% and 34.4%, respectively. Patients who were living alone [AOR = 1.94, (95% CI: 1.06, 3.56)], had poor social support [AOR = 5.57, (95% CI: 1.20, 10.84)] or had HIV-related perceived stigma [AOR = 2.35, (95% CI: 1.44, 3.84)] were more likely to have depression as compared to their counterparts. Those with a previous history of mental illness [AOR = 3.36, (95% CI: 1.31, 8.61)] and poor social support [AOR = 6.67, (95% CI: 1.47, 10.33)] were more likely to have anxiety symptoms.

Conclusion: The prevalence of anxiety and depression in the current study was high. Concerned health departments of the country should create guidelines to screen and treat depression and anxiety among HIV patients. Further research on hazard factors of depression and anxiety ought to be examined to strengthen and expand these findings.

Toma, A. (2019). Knowledge, Attitude and Practice of Farmers' towards Aflatoxin in Cereal Crops in Wolaita Zone, Southern Ethiopia. *EC Nutrition*, *14*, 247–254.

Abstract

Majority of the community in the study area is aware of aflatoxin and its effect on health but almost all are unaware of toxins other than aflatoxin. Results: Among 234, only 129 (55%) survey respondents had some level of awareness about Aflatoxin while the rest (105 i.e. 44.1%) were unaware about Aflatoxin. Media was cited as the most dominant source of knowledge about Aflatoxin followed by local resident health workers. Most respondents associated the health effects of Aflatoxin with abdominal disease, internal organ disease (like liver disease) and cancer. About 98.7% of the respondents believe that they don't feel any disease condition at the time of data collection. Methods: Community-based, cross-sectional, mixed methods were used to study aflatoxin systemic exposure in people living in rural communities of Wolaita zone of Ethiopia. To conduct assessment on farmers' knowledge, attitude and practice towards Aflatoxin exposure a
structured questionnaire was used and 234 farmers were interviewed and focused group discussion was also conducted. The data was analyzed by using SPSS version 20 and presented by tables and level of significance was set at p-value ≤ 0.05 . Background: Worldwide, approximately a quarter of agricultural products are contaminated with aflatoxins, with maize, cereals, and groundnuts being the most susceptible Factors influencing growth of aflatoxin on crops in the field include drought, high temperature, high humidity, and insect infestation; growth is also influenced by suboptimal harvesting, drying, and crop storage practices. People in developing countries are more likely to be exposed to aflatoxin due to favorable growth conditions and minimally enforced regulatory limits. The aim of this study was to investigate knowledge, attitude and practice of farmers towards Aflatoxin.

Keywords: Cereal Crops; Aflatoxin; Awareness and Perception Conclusion:

Hassen, M., Toma, A., Tesfay, M., Degafu, E., Bekele, S., Ayalew, F., Gedefaw, A., & Tadesse, B. T. (2019). Radiologic diagnosis and hospitalization among children with severe community acquired pneumonia: A prospective cohort study. *BioMed Research International*, 2019.

Abstract

Objectives. This study was designed to assess the role of chest radiography for the diagnosis of pneumonia and assess the association of clinical characteristics with radiologic findings and of hospitalization among children with severe community predictors acquired pneumonia. Methods. A prospective study was conducted on 122 children between ages of 3 month and 14 years admitted to pediatric emergency unit with diagnosis of severe pneumonia from September to November, 2017. Eligible children were subjected to chest radiography which was read senior radiologists independently (*R1* and *R2*). Disagreements by two between R1 and R2 were resolved by a third senior radiologist (R3). Level of agreement between radiologists was assessed using Cohen's kappa coefficient. Clinical and laboratory parameters which could explain the variability in the duration of hospital stay were assessed using a linear Independent predictors were using regression mode. assessed multiple linear regression. Results. The median age of the cohort was 10.0 months (interquartile range (IQR):

6.75-24.0); 76 (62.3%) were male. Nearly half, 63 (51.6%) did not have radiologic evidence of pneumonia. There was low level of agreement between *R1* and *R2* in reporting consolidation (kappa=0.435, p-value≤0.001), haziness (kappa=0.375, p-value≤0.001), and infiltration (kappa=0.267, p-value=0.008). Children with higher recorded temperature were more likely to have radiologic abnormalities suggesting pneumonia (p-value=0.033). The median duration of hospitalization was 3 days (IQR: 1-4 days); 118 (96.7%) were discharged with improvement. Height-for-age z-score (Coef.=0.203, R²=0.041, p-value=0.027); and hemoglobin level (Coef.=-0.249, R²=0.062, p-value=0.006) explained 4.1% and 6.2% of the variability in the duration of hospital stay, respectively. *Conclusion.* Radiologic evidence of pneumonia was absent in half of the children with severe pneumonia. There was low agreement between senior radiologists in reporting chest radiographic findings, potentially necessitating harmonization activities to uniformly implement the WHO guidelines in reading chest radiographs

Siyoum, M., & Mekonnen, S. (2019). Labor pain control and associated factors among women who gave birth at Leku primary hospital, southern Ethiopia. *BMC Research Notes*, *12*(1), 619.

Abstract

Objective

To assess labor pain control and associated factors among women who give birth at Leku primary hospital, southern Ethiopia, 2018/19. A systematic random sampling technique was used to select 404 mothers who gave birth at Leku hospital during the data collection period. Data were collected by two first degree midwives immediately after delivery using Labor Agentry Scale (LAS). Results

In this study, 404 mothers were participated making the response rate of 100%. Among the participants, 104 (25.7%) of mothers reported Mild control of labor pain. Maternal age of 19 to 24 year AOR = 5.85 (95% CI 2.14, 15.98), being farmer AOR = 2.5 (1.14, 5.57), primi-para AOR = 0.13 (0.06, 0.3), good family support AOR = 2.8 (1.49, 5.3), short duration of labor (< 12 h) AOR = 3.2 (1.65, 6.23) and history of pregnancy loss AOR = 0.06 (0.03, 0.14) were significantly associated with greater control of labor pain. In general, compared to other studies, the level of labor pain control is good in this study area. Enhancing factors of labor pain control have to be

strengthened to increase greater control of labor pain. Qualitative research is highly recommended to identify cultural factors related to labor pain control and management.

Kassa, Z. Y., Tenaw, Z., Astatkie, A., Siyoum, M., Bekele, G., Taye, K., Mekonnen, S., & Kassaye, Z. (2019). Mobile phone-based strategies for preconception education in Rural Africa. *Annals of Global Health*, 85(1).

Abstract

Background:

Prepreg Nancy health care is vital to alleviate and prevent maternal and neonatal disability and death.

Objectives:

The purpose of the study was to measure the levels of knowledge and attitude on preconception care and their determinants among women who delivered at government hospitals in a rural setting in southern Ethiopia.

Methods:

A facility-based cross sectional study was done from January 01 to February 30, 2017 on a sample of 370 women who delivered at government hospitals in Wolayita zone. The mothers were selected using systematic random sampling technique. The data were collected using structured and pretested interviewer administered questionnaires at the postnatal ward of each hospital. Data were analyzed using bivariate and multivariable techniques.

Results:

The result showed that 53% (95% confidence interval [CI]: 47.8%, 58.1%) of mothers who delivered at public hospitals had adequate level of knowledge on preconception care, whereas 54.3% (95% CI: 49.2%, 59.5%) possessed positive attitude to preconception care. Mothers who have radio, planned pregnancy and have participated in community meetings related to preconception care had a meaningfully higher odds of good level of knowledge to preconception care. Ordinal regression showed that women who own mobile phone had at least three times significantly higher odds of positive attitude to preconception care. Conclusions:

The results revealed that the levels of mothers' knowledge and positive attitude on preconception care are low relative to other studies. Using transistor radio and mobile phone have significant effect in improving the knowledge and attitude of reproductive age women on preconception care. Hence, providing community health education based on radio and/or mobile phone messaging could be useful in positively influencing the knowledge and attitude of women on preconception care.

Menjetta, T., Simion, T., Anjulo, W., Ayele, K., Haile, M., Tafesse, T., & Asnake, S. (2019). Prevalence of intestinal parasitic infections in Hawassa University students' clinic, Southern Ethiopia: A 10-year retrospective study. *BMC Research Notes*, *12*(1), 702.

Abstract

Objective

The purpose of this study was to determine the prevalence of intestinal parasitic infections among patients who had attended Hawassa University students' clinic, Southern Ethiopia.

Result

Over the 10 years period, a total of 13,679 patients visiting Hawassa University students' clinic were included in the study. A total of 6553 (47.9%) patients were positive for at least one intestinal parasite. The overall prevalence of intestinal helminth and protozoan infections was 20.3% and 27.6% respectively. There were four dual infections and one triple infection. E. histolytica/E. dispar trophozoite was the most common identified parasite, which was seen in 18% of the patients while Enterobius vermicularis (0.1%) was the least reported parasite. Other parasites identified were Ascaris *lumbricoides* (15.0%), Hookworm species (2.0%),Taenia species (1.8%), Hymenolepis nana (0.7%), Strongyloides stercoralis (0.3%), Trichuris trichuria (0.2%), and *Shistosoma mansoni* (0.2%). The prevalence of helminthes was higher in females (23.3%) than in mals (19.5%) (P < 0.00001) while that of protozoan infections was 28.5% in males than females (23.8%) (574/2414) (P < 0.00001).

Menjetta, T., Dana, D., & Debalke, S. (2018). Schistosoma mansoni infection and risk factors among fishermen at Lake Hawassa, Southern Ethiopia. *BioRxiv*, 488502.

Abstract

Schistosomiasis/Bilharziasis is one of the neglected tropical parasitic diseases caused by different species of genus schistosoma. Among the species, S.mansoni (causative agents of intestinal schistosomiasis) is one of the causes of severe intestinal parasitic infections with high public and medical importance in Ethiopia. There is scarcity of information about the status of *S.mansoni* infection among the fisherman in the present study area and in the country at large. Therefore this study was designed to determine the prevalence and risk factors of S.mansoni infection among fishermen at Lake Hawassa, southern Ethiopia. A cross-sectional study was conducted among the fishermen from April to June 2013 in Hawassa, Southern Ethiopia. A total of 243 fishermen were included by Systematic Random Sampling from the lists of the fishermen members in the registration book of fishermen associations in the Hawassa Town. Data on socio-demographic features and risk factors were collected by using semi-structured questionnaires. Stool samples were collected and processed using Kato-Katz thick smear techniques and examined between 30-40 minute for hook worm and after 24 hours for S.mansoni and other soil transmitted helminths (STHs). The overall prevalence of *S.mansoni* among the fishermen was 29.21% (71/243) and the mean intensity of infection was 158.88 eggs per gram (EPG). The prevalence of intestinal helminths including S.mansoni was 69.54% (169/243). Moreover, the prevalence of soil transmitted helminths (STHs) were 40.74% (99/243), 35.80% (87/243) and 5.76% (14/243) for A. lumbricoides, T. trichiura and hookworm species, respectively. Almost similar prevalence of S.mansoni, 31.82%, 31.75%, 31.94% were recorded in age groups of 15-19, 20-24 and 25-29 years, respectively. Fishermen who are swimming always were 2.92 times [95% CI: 1.554, 5.5021 more likely to acquire S.mansoni infection than other water contacting habit of the study participants. The results of current investigation indicated the moderate endemicity of *S.mansoni* among the fishermen at Lake Hawassa, southern Ethiopia. Fishermen could be the potential risk group for S.mansoni infection and might be responsible for the transmission of S.mansoni to other segments of the communities. Since high prevalence of STH were recorded among the fishermen,

integrated prevention and control strategies from different sectors might be important to tackle the problem.

Wube, T. B., Nuru, M. M., & Anbese, A. T. (2019). A comparative prevalence of metabolic syndrome among type 2 diabetes mellitus patients in Hawassa university comprehensive specialized Hospital using four different diagnostic criteria. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, *12*, 1877.

Abstract

Background

Recognition of MetS in type two diabetic patients is important in starting the appropriate preventive and therapeutic measures. The commonly used definitions of MetS have similarities and discrepancies. Different definitions defined metabolic syndrome differently. IDF, WHO, NCEP-ATP III, and the harmonized definitions were used frequently to determine the prevalence of metabolic syndrome.

Objectives

This study was aimed to investigate the prevalence of MetS and its associated factors among patients with type 2 Diabetes Mellitus using four definitions and to identify the concordance and the difference of these four definitions.

Methods: A cross-sectional study was conducted from February 28 to May 30/2017 at Hawassa university comprehensive specialized hospital. The study involved 314 study participants selected by simple random sampling technique. Logistic regression was used to determine associated factors of metabolic syndrome, and kappa statistics was used to determine the concordance between different definitions of metabolic syndrome. In any cases, a p-value of <0.05 was considered to be statistically significant.

Result: The prevalence of metabolic syndrome according to IDF, WHO, harmonized, and NCEP-ATP III diagnostic criteria was 59.9%, 31.2%, 65.6%, and 70.1%, respectively. Our study found the maximum agreement between IDF and NCEP criteria (K=0.54, P<0.001) and IDF and Harmonized (K=0.65, P<0.001). Uric acid level was associated factor of metabolic syndrome by all the four definitions, and total cholesterol was associated factors by the three definitions. Conclusion: The prevalence of metabolic syndrome varies based on the definition used and the highest prevalence of MetS was observed with NCEP-ATP III and the different types of criteria do not always diagnose the same group of individuals.

Keywords: Type 2 DM, Metabolic syndrome, Hawassa, Ethiopia

Siyoum, M., & Melese, T. (2019). Factors associated with low birth weight among babies born at Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia. *Italian Journal of Pediatrics*, *45*(1), 48.

Abstract

Background

Low birth weight is defined as infant born with weight of less than 2500 g. It is one of the major public health problems worldwide. In Ethiopia, there are limited evidences on factors contributing to low birthweight.

Objective

To assess factors associated with low birth weight babies in Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia from March to April, 2018.

Methods and Materials

An unmatched case control study was conducted at Hawassa University Comprehensive Specialized Hospital. All low birth weight newborns and two unmatched controls for each case were included in the study from March to April, 2018. Data were collected through face to face interview using a structured and pre-tested questionnaire. The collected data were managed with Epi-data version 3.1 software and exported to the Statistical Package for Social Science (SPSS) version 22. Bivariate and multivariate binary logistic regression were used to identify factors associated with low birth weight at p-value < 0.05 with their respective odds ratios and 95% confidence interval. Hosmer-Lemeshow test was used to assess goodness-of-fit.

Results

In this study 330 mother-newborn pairs (110 cases and 220 controls) were participated making 100% response rate. Among the participants 325(98.48%) were married, 164 (49.7%) were Protestant, 296 (89.7%) had ANC follow up and 212 (64.24%) were multipara. Mothers' mid-upper arm circumference less than 220 mm [(AOR)=2.89, 95% CI: 1.58, 5.29)], lack of nutritional

counseling [AOR = 2.37, 95%CI: 1.3, 4.34], presence of complications during pregnancy [AOR = 2.96, 95%CI: 1.55, 5.64)] and lack of iron supplementations during pregnancy [AOR = 2.89, 95%CI: 1.58, 5.29)] were significantly associated with Low birth weight. Conclusions

Mothers' mid-upper arm circumference less than 220 mm, lack of nutritional counseling, presence of complications and lack of iron supplementations during current pregnancy were significantly associated with low birth weight. Counseling on nutrition during prenatal care needs attention of service providers.

Jemebere, W. (2019). Barriers Associated with Presentation Delay among Breast Cancer Patients at Hawassa University Comprehensive and Specialized Hospital, Southern Ethiopia. *International Journal of Caring Sciences*, *12*(3).

Abstract

Background: Breast cancer remains the most common cancer and most common cause of cancerrelated mortality among women worldwide.

Objectives: The main purpose of this study is to assess barriers resulting in delayed patient presentation to breast cancer care among breast cancer patients under treatment at Hawassa university comprehensive specialized hospital. This study is the first conducted in the study area.

Methods: A hospital-based descriptive cross-sectional study design was done from 1 Jun--30 December 2017 to answer the study objectives. All delayed 106 women under breast cancer treatment during data collection period were participated in the study. Structured data collection tool which encompass possible barriers in developing countries were applied to collect data from each study subject. Before the data collection, written ethical clearance letter was obtained from IRB of Hawassa university. Data entry was done using EPI Info 3.5.4 and exported to SPSS version 20.0 software package for analysis.

Results: This study revealed that delay was multi-factorial. Of 106 delayed women to breast cancer care, (98.1%) didn't have knowledge about sign and symptom of breast cancer; (71.7%) were thinking the breast cancer lump was not dangerous enough to consult expert health

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professionals and (64.2%) using alternative medicines like prayer, herbal remedy or traditional healers. There was no significant statistical association found with major causes of delay and socio-demographic characteristics of the women.

Conclusion: A significant percentage of women with breast cancer in Hawassa and nearby are experiencing presentation delay due socio-cultural, economic and health and health related causes. Hence, an intense and focused awareness campaign about breast cancer is needed to educate the general population by Ethiopian cancer association, Federal ministry of health, regional health offices any other concerned body.

Tadesse, F., Alemayehu, Y., Shine, S., Asresahegn, H., & Tadesse, T. (2019). Exclusive breastfeeding and maternal employment among mothers of infants from three to five months old in the Fafan zone, Somali regional state of Ethiopia: A comparative cross-sectional study. *BMC Public Health*, *19*(1), 1015.

Abstract

Background

Lack of exclusive breastfeeding is the most important risk factor for infant and young child morbidity and mortality. A better understanding of the factors that influence EBF is important in order to promote appropriate infant feeding practices. The return to work due to short maternity leave time may hinder employed mothers from breastfeeding their infants exclusively for the recommended six months duration.

Methods

A community based comparative cross-sectional study was conducted from January to February 2016 in the Fafan zone, of the Somali Regional State, of Ethiopia. A total of 558 mothers with infants from ages 3–5 months, living in the five districts (Jigjiga city, Kebribeyah town, Aubere town, Bombas town and Babile) were included in the analysis. Logistic regression models were used to examine the effect of maternal employment on EBF practice.

Results

This study has demonstrated a 24.8 and 82.9% prevalence of EBF practices among employed and unemployed mothers of index infants of 3–5 months respectively in the 24 h preceding the survey. Unemployed mothers were accounted for thusly: [Adjusted OR = 26.5; 95% CI (13.6, 51.6). Other

adjustments included monthly income of 500–2000 birr [Adjusted OR = 2.7; 95% CI (1.4, 5.2)]; monthly income of 2001–3500 birr [Adjusted OR = 2.2; 95% CI (1.2, 4.0)]; timely initiation of breastfeeding [Adjusted OR = 2.6; 95% CI (1.4, 4.8)]; maternal education (secondary and higher) [Adjusted OR = 3.8; 95% CI (1.5, 9.5)]; having an index infant aged 3 months [Adjusted OR = 2.2; 95% CI (1.2, 4.1)], and having an index infant aged 4 months [Adjusted OR = 2.2; 95% CI (1.2, 3.8)] were found to be significantly associated with exclusive breastfeeding practice.

Conclusion

Exclusive breastfeeding practices were very low among mothers employed in governmental and non-governmental organizations in the study area. Therefore, maternal employment may be hindering Exclusive breastfeeding practices. Thus, establishing breastfeeding-friendly working environment; and Information, Education and Communication programs should be provided, particularly for working mothers to promote exclusive breastfeeding practices.

Kassa, Z. Y., Awraris, T., Daba, A. K., & Tenaw, Z. (2019). Compliance with iron folic acid and associated factors among pregnant women through pill count in Hawassa city, South Ethiopia: A community based cross-sectional study. *Reproductive Health*, *16*(1), 14.

Abstract

Background

Iron deficiency anemia during pregnancy is a public health problem across the globe that adversely affects maternal and perinatal outcome. World Health Organization recommends that universal iron folic acid supplementation of pregnant women. Therefore, the aim of this study was to determine compliance and identify factors associated with Iron folic acid among pregnant women. Methods

Community based cross-sectional study was conducted from November 01–December 30, 2015 on pregnant women from Hawassa city. An Interviewer administered questionnaire was used to collect data from 422 selected study subjects using simple random sampling technique. Data were entered in to Epi-Data version 3.1 and exported to SPSS version 20 for analysis. Bivariate and multivariable analyses were employed to test presence of association between dependent and independent variables. *P* value < 0.05 was considered as statistically significant.

Result

In this study prevalence of compliance with iron folic acid was reported 38.3% (95%CI: 33.1, 42.5). Women who know the importance of iron folic acid had 6 times higher odds of compliance with iron folic acid than counterpart (AOR = 6.1, 95% CI: 3.53, 10.24).Pregnant women who develop complication during the previous pregnancy had 0.34 times lower odds of compliance with counterpart (AOR = 0.34, 95% CI: 0.16–0.76), experiencing iron folic acid related side effects during the previous pregnancy had 8.5 time higher odds to decrease compliance with than those did not experience iron folic acid related side effects (AOR = 8.5, 95% CI: 4.65.-15.35). Conclusion

In this study demonstrated that compliance with iron folic acid among pregnant women through pill count is low. Women who know the importance of iron folic acid, women who develop complications during previous pregnancy, experiencing iron folic acid related side effects during the previous pregnancy were independent predictor of compliance with iron folic acid. Health care providers shall strongly counsel the importance and side effect of iron folic acid before prescribing. The responsible bodies avail suitable iron folic acid pill and less side effect brands. Health care providers and health extension workers shall be monitored iron folic acid by pill count during their home to home visits.

Tenaw, Z., Kassa, Z. Y., Kassahun, G., & Ayenew, A. (2019). Maternal Preference, Mode of Delivery and Associated Factors among Women Who Gave Birth at Public and Private Hospitals in Hawassa City, Southern Ethiopia. *Annals of Global Health*, 85(1).

Abstract

Introduction:

Despite the advances in modern obstetrics care, maternal morbidity and mortality remains a big problem. Proper choice in the mode of delivery is necessary to tackle this problem. The aim of this study was to assess maternal preference, mode of delivery and associated factors among women who gave birth at public and private hospitals in Hawassa city, Southern Ethiopia, 2017. Methods:

A hospital based cross sectional study was carried out from January 01–30/2017. A systematic sampling procedure was utilized, and 300 mothers who gave births were included in the study. Data entered to EPI data 3.5.1 and exported to version 20.0 software packages for social science

analysis. The presence of association between independent and dependent variables was determined using odds ratio at 95% confidence interval by applying logistic regression model. Results:

The prevalence of caesarean section was 49.3% (95% CI: 43.7–55.3). Mothers that have a monthly income above poverty line, having previous pregnancy complications, and current pregnancy problems have higher odds of using the caesarean section mode of delivery. Whereas utilization of partograph lower the odds of caesarean section mode of delivery. Having previous pregnancy complications had higher odds of maternal preference for caesarean section delivery whereas the utilization of partograph lowered the odds of maternal preference for Caesarean section delivery. Conclusion:

The prevalence of caesarean section mode of delivery in Hawassa city was high compared with world health organization threshold. Monthly income above poverty line, previous pregnancy complications, Current obstetrics problems are increasing caesarean section delivery, whereas utilization of partograph is decreasing caesarean section delivery. Therefore, utilization of partograph could be lessening unnecessary caesarean section delivery.

Kassa, Z. Y., Tenaw, Z., Astatkie, A., Siyoum, M., Bekele, G., Taye, K., Mekonnen, S., & Kassaye, Z. (2019). Mobile phone based strategies for preconception education in Rural Africa. *Annals of Global Health, Volume 85, Issue 1*

Abstract

Background: Prepregnancy health care is vital to alleviate and prevent maternal and neonatal disability and death.

Objectives: The purpose of the study was to measure the levels of knowledge and attitude on preconception care and their determinants among women who delivered at government hospitals in a rural setting in southern Ethiopia.

Methods: A facility-based cross sectional study was done from January 01 to February 30, 2017 on a sample of 370 women who delivered at government hospitals in Wolayita zone. The mothers were selected using systematic random sampling technique. The data were collected using structured and pretested interviewer administered questionnaires at the postnatal ward of each hospital. Data were analyzed using bivariate and multivariable techniques.

Results: The result showed that 53% (95% confidence interval [CI]: 47.8%, 58.1%) of mothers who delivered at public hospitals had adequate level of knowledge on preconception care, whereas 54.3% (95% CI: 49.2%, 59.5%) possessed positive attitude to preconception care. Mothers who have radio, planned pregnancy and have participated in community meetings related to preconception care had a meaningfully higher odds of good level of knowledge to preconception care. Ordinal regression showed that women who own mobile phone had at least three times significantly higher odds of positive attitude to preconception care. Whereas women who have participated community meetings had lower odds of positive attitude on preconception care. Conclusions:

The results revealed that the levels of mothers' knowledge and positive attitude on preconception care are low relative to other studies. Using transistor radio and mobile phone have significant effect in improving the knowledge and attitude of reproductive age women on preconception care. Hence, providing community health education based on radio and/or mobile phone messaging could be useful in positively influencing the knowledge and attitude of women on preconception care.

Bililign Yimer, N., Tenaw, Z., Solomon, K., & Mulatu, T. (2019). Inadequate prenatal visit and home delivery as determinants of perinatal outcomes: Does parity matter? *Journal of Pregnancy*, 2019.

Abstract

Background. Adverse perinatal outcomes are still high in developing countries. Contradicting evidences were reported about the effect of parity on adverse perinatal outcomes. The aim of this study was to compare perinatal outcomes in grand multiparous and low multiparity women in Hawassa University Comprehensive Specialized Hospital and Adare General Hospital of Ethiopia. *Methods*. Comparative cross-sectional study design was employed to include 461 mothers from February to June 2018. Data were collected by structured questionnaire using interview and from patient charts. Data were entered using EPI-DATA version 4.4.2.0. Descriptive statistics and logistic regression analyses were computed using STATA version 14 computer software. *Results*. Of all study participants, 24.9% (95% Confidence interval: 21.1%-29.1%) had at least one adverse perinatal outcome. Stillbirth (38.9), low Apgar score (51.9%), and congenital malformation (3.70%) were frequently occurred complications in grand multiparas compared to

low multiparous women. Nevertheless, meconium aspiration, need for resuscitation, and macrosomia were higher in low multiparous women (9.84%, 14.75%, and 57.38%, respectively). Less than four prenatal visits (AOR: 1.74; 95% CI: 1.04, 2.92) and previous home delivery (AOR: 1.87; 95% CI: 1.04, 3.33) were independent predictors of adverse perinatal outcomes. However, parity did not show statistically significant difference in perinatal outcomes. *Conclusion*. This finding underscores the fact that frequency of antenatal care and place of delivery are significant difference in perinatal outcomes. Women empowerment, promoting health facility delivery, and early, comprehensive antenatal care are needed.

Duko, B., Geja, E., Oltaye, Z., Belayneh, F., Kedir, A., & Gebire, M. (2019). Triage knowledge and skills among nurses in emergency units of Specialized Hospital in Hawassa, Ethiopia: Cross sectional study. *BMC Research Notes*, *12*(1), 1–4.

Abstract

Objective

This study was aimed to assess knowledge and skills of triage and associated factors among nurses in emergency department of Hawassa University Comprehensive Specialized Hospital, South Ethiopia. Institutional based cross-sectional study design was conducted among 101 nurses from March 1–30, 2018. The data was coded and entered to SPSS version 22.0. Descriptive statistics was done and Chi square test was done to show the association between independent variables and dependent variable.

Results

Among the study participants, 57.4% were female and 87% were in age group of \leq 30 years. 51.5% had low triage knowledge scores, with the mean score being 9.54 (SD = 2.317), 76.2% perceived their overall triage skill to be at good level, with mean score 95.75 (SD = 9.562). Working experience of study participants (χ^2 = 15.204, p < .01), Educational level of study participant (χ^2 = 22.148, p < .01) and triage experience (χ^2 = 13.638, p < .01) were factors associated with triage knowledge. Working experience (χ^2 = 7.944, p < .05) and triage experience (χ^2 = 6.264, p < .05) were factors associated with triage skill.

Kassa, A., & Woldesemayat, E. M. (2019). Hypertension and diabetes mellitus among patients at Hawassa University comprehensive specialized hospital, Hawassa, Southern Ethiopia. *International Journal of Chronic Diseases*, 2019.

Abstract

Background. The burden of noncommunicable disease (NCD) in Africa is on a remarkable rise exacerbating the poor public health status affected by the existing but yet unsolved communicable disease. In Ethiopia, there is a paucity of evidence regarding prevalence and risk factors to NCD. Objective. This study sought to determine the prevalence of risk factors of NCDs, prevalence of DM and HTN, and risk factors associated with diabetes mellitus (DM) and hypertension (HTN). Method. This is an institution based cross-sectional study conducted on a sample of 411 clients attending a university-based comprehensive specialized hospital in Southern Ethiopia. The data was collected by using a pretested interviewer-administered questionnaire and observational checklist. Frequency, proportions, bivariate and multivariate logistic regression analysis was conducted using SPSS software version 20. Result. We identified 64.2% of the clients had at least one of the risk factors to the NCDs. One-third (33.3%) had physical inactivity, whereas 20.2% had a BMI of \geq 25%. The prevalence of DM and HTN was 12.2% and 10.5%, respectively. The multivariate analysis demonstrated that age ≥ 60 years, physical inactivity, higher BMI, and cigarette smoking were risk factors for at least one of the NCDs. Conclusion. The prevalence of DM and prevalence of HTN were high. The magnitudes of risk factors to NCDs among the study population were substantial. Higher BMI, physical inactivity, low fruit and vegetable consumption, alcohol use, khat chewing, and cigarette smoking were among the prevailing risk factors identified.

Hassen, S. L., Astatkie, A., Mekonnen, T. C., & Bogale, G. G. (2019). Survival status and its determinants among under-five children with severe acute malnutrition admitted to inpatient therapeutic feeding centers in south Wollo zone, Amhara region, Ethiopia. *Journal of Nutrition and Metabolism*, 2019.

Abstract

Background. Under nutrition is one of the leading causes of morbidity and mortality in under-five children in developing countries including Ethiopia. In Ethiopia, many children with severe acute malnutrition (SAM) are treated at inpatient therapeutic feeding centers. However, the survival status and its determinants are not well understood. Therefore, the aim of this study was to estimate the survival status and its determinants among under-five children with severe acute malnutrition admitted to inpatient therapeutic feeding centers (ITFCs). Methods. A record review was conducted on 414 under-five children who were admitted with severe acute malnutrition to ITFCs in South Wollo Zone, northeast Ethiopia, between September 11, 2014, and January 9, 2016. Data were entered into Epi-Info version 7.2 and analyzed using SPSS version 20. Life table analysis was used to estimate cumulative proportion of survival. The relationship between time to recovery and covariates was determined using Cox-proportional hazards regression model. was used to declare presence of significant association between recovery time and covariates. Results. Of the total children recorded, 75.4% of children were recovered and discharged, 10.3% were defaulters, 3.4% died, 7.4% were nonresponders, and 3.4% were unknown. The mean (±standard deviation) time to recovery was 12 (± 5.26) days, whereas the median time to recovery was 11 (interquartile range of 8-15) days. Children's breastfeeding status at admission (AHR: 1.42, 95% CI: 1.10, 1.83) and children without comorbidities at admission (AHR: 1.44, 95% CI: 1.03, 2.00) had statistically significant effect on time to recovery from SAM. Conclusion. All treatment responses in this study were within the recommended and acceptable range of global standards. Policy makers, health facilities, and care providers may need to focus on the importance of breastfeeding especially for those under two years of age and give emphasis for cases with comorbidities.

Bogale, B., Astatkie, A., & Wakgari, N. (2019). Effect of Pregnant Mothers' Forum Participation on Birth Preparedness and Complication Readiness among Pregnant Women in Dale District, Southern Ethiopia: A Comparative Cross-Sectional Study. *Journal of Pregnancy*, 2019.

Abstract

Background. Pregnant mothers' forum is the innovative intervention strategy being implemented in Ethiopia to facilitate birth preparedness and complication readiness practice. However, its effect on birth preparedness and complication readiness has not been investigated. *Objective*. This study assessed the association of participation in pregnant mothers' forum with birth preparedness and complication readiness plan among pregnant women in Dale District. Methods. A communitybased comparative cross-sectional study was conducted among 604 pregnant women (302 who were forum members [exposed] and 302 who were forum nonmembers [unexposed]). Multistage sampling technique was used to select respondents. Data were collected door to door using a pretested and structured questionnaire through face-to-face interview. Data were entered and analyzed using SPSS version-20. Multiple logistic regression analysis was used to identify the effect of pregnant mothers' forum membership on birth preparedness and complication readiness adjusting for other variables. Results. About 22.5% of pregnant women were well prepared for birth. A quarter (25.8%) of the women was prepared for the anticipated complications of whom 20.7% were the forum members. Being pregnant mother's forum member (AOR=2.86, 95%) CI=1.50,5.44), having focused counseling (AOR=3.73, 95% CI=1.17,11.83), monthly income (AOR=2.55, 95% CI=1.44,4.51), having antenatal care (AOR=3.73,95% CI=1.05,13.21), and institutional delivery during last birth (AOR=2.41, 95% CI=1.38,4.22) were significantly associated with birth preparedness. Similarly, being forum members (AOR=3.55, 95%CI=2.18, 5.78) and having antenatal care attendance before or at four months of gestational age (AOR=3.16, 95%CI=2.04, 4.91) were found to be predictors of complication readiness. Conclusion. In this study, birth preparedness and complication readiness is found to be low. However, it was significantly higher among forum members compared to forum nonmembers. Hence, efforts should be targeted to strengthen the pregnant mothers' forum and enroll the pregnant women to antenatal care service at early stage of the pregnancy.

Hailu, S., Astatkie, A., Johansson, K. A., & Lindtjørn, B. (2019). Low immunization coverage in Wonago district, southern Ethiopia: A community-based cross-sectional study. *PloS One*, *14*(7), e0220144.

Abstract

Introduction

Immunization is a cost-effective intervention that prevented more than 5 million deaths worldwide from 2010 to 2015. Despite increased vaccination coverage over the past four decades in many African countries, including Ethiopia, universal coverage has not yet been reached. Only 39% of children aged 12–23 months received full vaccinations in Ethiopia, according to the 2016 Ethiopian Demographic Health Survey. This study aimed to evaluate immunization coverage and identify individual and community factors that explain incomplete vaccination coverage among children aged 6–36 months in the Wonago district of southern Ethiopia.

Methods

We conducted a community-based, cross-sectional study in three randomly selected kebeles in the Wonago district from June to July 2017. Our nested sample of 1,116 children aged 6–36 months included 923 child-mother pairs (level 1) within kebeles (level 2). We conducted multilevel regression analysis using STATA software.

Results

Among participants, 85.0% of children aged 12–36 months received at least one vaccine, and 52.4% had complete immunization coverage. After controlling for several individual and community variables, we identified six significant predictor variables for complete immunization: Older mothers' age (AOR = 1.05, 95% CI: 1.00-1.09), higher utilization of antenatal care (AOR = 1.36, 95% CI: 1.14-1.62), one or more tetanus-toxoid vaccination during pregnancy (AOR = 2.64, 95% CI: 1.43-4.86), mothers knowing the age at which to complete child's vaccinations (AOR = 2.00, 95% CI: 1.25-3.20), being a female (AOR = 0.64, 95% CI: 0.43-0.95), and child receiving vitamin A supplementation within the last 6 months (AOR = 2.79, 95% CI: 1.59-4.90). We observed a clustering effect at the individual and community levels with an intra-cluster correlation coefficient of 48.1%.

Conclusions

We found low immunization coverage among children in the Wonago district of southern Ethiopia, with significant differences across communities. Promoting maternal health care and community service could enhance immunization coverage.

Belay, S., Astatkie, A., Emmelin, M., & Hinderaker, S. G. (2019). Intimate partner violence and maternal depression during pregnancy: A community-based cross-sectional study in Ethiopia. *PloS One*, *14*(7), e0220003.

Abstract

Introduction

Intimate partner violence (IPV) is regarded an important public health and human rights issue, characterized by physical, sexual or emotional abuse. Globally more than one in three women report physical or sexual violence by their intimate partners. Though the association between IPV and depression is known, we found no study investigating depression as a risk factor for IPV and very few studies using standard tools in assessing both IPV and depression among pregnant women.

Aim

To measure the prevalence of IPV and depression during pregnancy and assess the association between IPV and depression and other determinants.

Methods

A community-based cross-sectional study was conducted among 589 pregnant women living in Wondo-Genet district, southern Ethiopia. IPV experience was assessed using a structured questionnaire of the World Health Organization (WHO), and maternal depression was measured by the Edinburgh Postnatal Depression Scale (EPDS). Descriptive statistics were computed and multivariable logistic regression was carried out to estimate risk and adjust for confounders. Results

The overall prevalence of IPV was 21% (95% confidence interval [CI] = 18.1-24.7). After adjusting for potential confounders, increased risk of IPV remained among rural women (adjusted odds ratio[AOR] = 2.09; 95%CI = 1.06-4.09), women who had parental exposure to IPV (AOR = 14.00; 95%CI = 6.43-30.48), women whose pregnancy was not desired (AOR = 9.64; 95%CI = 3.44-27.03), women whose husbands used alcohol (AOR = 17.08; 95%CI = 3.83-76.19), women with depression (AOR = 4.71; 95%CI = 1.37-16.18) and women with low social support (AOR =

13.93; 95%CI = 6.98-27.77). The prevalence of antenatal depressive symptom (with EPDS score above 13) was 6.8% (95% CI 6.2–11.3). Increased risk of depression was found among women who had been exposed to IPV (AOR = 17.60; 95%CI = 6.18-50.10) and whose husbands use alcohol (AOR = 3.31; 95%CI = 1.33-8.24).

Conclusion

One in five pregnant women experienced IPV and it was strongly associated with depression. Screening for IPV and depression at antenatal visits with referral to relevant care and service is recommended

Gebre, B. B. (2019). Factors Associated With Alcohol Use Disorder Among People Living With HIV/AIDS Attending Art Clinic, Mizan Tep University Teaching Hospital, South West Ethiopia. *Hiv/Aids (Auckland, NZ)*, *11*, 239.

Abstract

Introduction

Alcohol use is a major public health concern in global settings. It is very common among people living with HIV/AIDS, leading to physical and mental complications.

Objective

To assess the magnitude of alcohol use and factors among HIV/AIDS positive adults visiting ART clinic at Mizan Tep University Teaching Hospital (MTUTH), Southern Ethiopia from October 2017 to December 2017.

Methods

A facility based cross-sectional study was conducted with a sample of 332 HIV positive adults who came to ART clinic at MTUTH using systemic random sampling technique. Data were entered into EPidata 3.1 version and then analyzed by SPSS version 20. Binary logistic regressions have been used to identify the association between an independent variable with the dependent variable.

Result

A total of 332 participants were enrolled in the study with the prevalence of alcohol use disorder (AUD) of 18.4%. Factors associated with alcohol use disorder were sex AOR=3.48 (95% CI: 1.27, 9.59), cigarette smoking AOR=5.12 (95% CI: 4.02, 8.61), "khat" chewing AOR=3.23 (95% CI: 2.06.6.89), and CD4 count of 0–200 AOR = 19.49 (95% CI: 1.74, 218.4).

Conclusion

The prevalence of alcohol use disorder was high. It is independently associated with male patients, cigarette/tobacco smokers, khat chewers, and low CD4 count.

Keywords: Magnitude, Alcohol use disorder, Factors

Gebre, B. B., & Assefa, Z. M. (2019). Magnitude and associated factors of diabetic complication among diabetic patients attending Gurage zone hospitals, South West Ethiopia. BMC Research Notes, 12(1), 780.

Abstract

Objective

To assess the magnitude of diabetic complication and associated factors among diabetes mellitus patients attending in Gurage zone hospitals.

Results

According to this study the magnitude of diabetic complication among diabetic patients were 61% and the marital status; divorced [AOR: 0.252 (0.11, 0.59); p = 0.002], poor glycemic control [AOR: 1.88 (1.04, 3.39); p = 0.036], body mass index > 25 [AOR: 4.42 (1.32, 14.86); p = 0.016] and duration of illness > 6 years [AOR :1.79 (1.02, 3.17); p = 0.044] and 10 years [AOR: 4.68 (2.07, 10.61); p = < 0.001] were significantly associated with diabetic complication.

Ali, M. M., Woldeamanuel, Y., Woldetsadik, D. A., Chaka, T. E., Fenta, D. A., Dinberu, M. T., Weldetensaye, E. K., Ismael, S. J., & Tadesse, B. T. (2019). Prevalence of group B streptococcus among pregnant women and newborns at Hawassa University comprehensive specialized hospital, Hawassa, Ethiopia. *BMC Infectious Diseases*, *19*(1), 325.

Abstract

Background

Group B streptococcus (GBS) is reported as the leading cause of neonatal sepsis and meningitis. Newborns from GBS colonized pregnant women are at high risk of infection.

Method

A Hospital based cross-sectional study was conducted at Hawassa University Comprehensive Specialized Hospital from November 05, 2014 to March 25, 2015. A total of 280 pregnant women along with their newborns were screened for GBS using standard method recommended by Center of Disease Control and Prevention. GBS strains were serotyped by using serotype specific antisera. A structured questionnaire was used to collect sociodemographic, obstetrics and clinical data of pregnant women and newborns. Data was analyzed by using chi-square and logistic regression to determine factors associated with prevalence of GBS among pregnant women and newborns. Descriptive statistics was used to determine prevalence of GBS among pregnant women and newborns. *P* value less than 0.05 was considered statistically significant.

Result

Prevalence of GBS among pregnant women, newborns and vertical transmission rate at Hawassa University Comprehensive Specialized Hospital were 44(15.7%), 26(8.9%) and 59.1% respectively. Among 26 GBS colonized newborns one developed sign and symptoms of early onset disease. Serotype distribution of GBS isolates collected from pregnant women and newborns was Ia 13(18.6%), Ib 9(12.9%), II 24(34.3%), III 8(11.4%), V 14(20%), and NT 2 (2.9%).

Conclusion

In our study we found relatively high prevalence of GBS among pregnant women and vertical transmission rate. The most prevalent GBS serotypes identified in this study were serotype II followed by V, Ia and Ib. Therefore, appropriate prevention strategies such as intrapartum antibiotic prophylaxis and vaccine development should be considered.

Fenta, D. A. (2019). Seroprevalence of Toxoplasma gondii among pregnant women attending antenatal clinics at Hawassa University comprehensive specialized and Yirgalem General Hospitals, in Southern Ethiopia. *BMC Infectious Diseases*, *19*(1), 1056.

Abstract

Background

Toxoplasmosis is caused by infection with the protozoan parasite *Toxoplasma gondii*. It is acquired by consumption of raw or undercooked meat containing tissue cyst, food or water contaminated with oocyst and congenital infection through the placenta leading to serious congenital abnormalities in the fetus like miscarriage, stillbirth, intrauterine death and neurologic defects. Therefore; this study was aimed to determine the prevalence of toxoplasmosis infection and its possible risk factors associated with pregnant women attending antenatal clinics in Hawassa and Yiregalem Hospitals, Southern Ethiopia.

Methods

A hospital-based cross-sectional study was conducted from December 2016 to May 2017. The study was done in antenatal care clinics of Hawassa and Yiregalem Hospitals in Southern, Ethiopia. Five hundred pregnant women were interviewed with a pretested structured questionnaire to collect risk factors and socio-demographic data. Blood samples were collected and serum was separated and tested for *anti- Toxoplasma gondii* antibodies using ELISA (Enzyme-linked Immunosorbent Assay). Data were analyzed using SPSS version 20 statistical software. The risk factors were tested for significance using Bivariate and multivariate analysis. *P*-value < 0.05 was considered statistically significant.

Results

The weighted prevalence of this study was 81.8% for the anti-*Toxoplasma gondii* antibody. Almost all participants (99.6%) had no information about the disease. A significant association was observed between seroprevalence and contact with domestic cats (OR = 1.206, 95% CI (1.627-2.206, P = 0.043), consumption of raw meat (OR = 0.848, 95% CI: 1.517-2.941, P = 0.019) and unpasteurized milk (OR = 0.871, 95% CI 1.531-2.221, P = 0.032). A significant association was not observed between seroprevalence and age, history of abortion, and blood transfusion.

Conclusions

The findings of this study demonstrated a relatively higher prevalence of seropositivity than studies reported from other countries. Existence of domestic cats at home, consumption of undercooked meat and unpasteurized milk were identified as risk factors for *T. gondii* infection. Therefore, a health education program to increase the mother's knowledge about *toxoplasmosis* towards avoiding eating undercooked meat, contact with cats and consumption of unpasteurized milk during pregnancy is recommended. Furthermore, our results suggested that the implementation of newborn screening and follow-up testing can lead to reducing of toxoplasmosis associated complications.

Wakgar, N., Dulla, D., & Daka, D. (2019). MATERNAL NEAR MISSES AND DEATH IN SOUTHERN ETHIOPIA: A RETROSPECTIVE STUDY. *Ethiopian Journal of Reproductive Health*, 11(2), 9–9.

Abstract

BACKGROUND: Globally, maternal deaths declined by 44 percent between 1990 and 2015, however it remains unacceptably high in sub-Saharan Africa. In Ethiopia, around 13, 000 of women and 84,437 neonates died annually in 2013. Hence, this study assessed the magnitude of maternal near misses and death in southern Ethiopia. METHODS: An institution based retrospective cross-sectional study design was conducted from October, 1 to 30, 2016. All mothers registered with pregnancy related complication during August 2014 to September 2016 were included in the study. World health organization maternal near misses' tool were used to collect the data. SPSS version 20.0 was used to calculate various indicators. RESULT: In this study, 15,059 cases attended obstetric care service during the study period. Among total admission 591 were identified with severe maternal outcomes. The main causes for admission were severe preeclampsia (51.8%) followed by postpartum hemorrhage (24.9%). Out of the total severe maternal outcomes 90 (15.2%) end up with maternal death while the rest (84.8%) were nearmisses. One hundred seventy (28.8%) of newborn died during delivery. In the current study, the total maternal near misses and maternal mortality ratio was 33.3 per 1000 live birth and 59.7 per 100,000 live births respectively. In addition, sever maternal outcome and total near-misses ratio to maternal death were 39.2 per 1000 live birth and 5.57:1 respectively. CONCLUSION AND **RECOMMENDATIONS:** A significant percentage of women were near misses and suffered from

life threatening conditions. It is highly advisable to use an assessment guide protocol and documentation.

Keywords: Ethiopia, Maternal Near Misses

Hussen, S., Mulatu, G., & Kassa, Z. Y. (2019). Prevalence of Shigella species and its drug resistance pattern in Ethiopia: A systematic review and meta-analysis. *Annals of Clinical Microbiology and Antimicrobials*, *18*(1), 22.

Abstract

Background

Shigella species are a major cause of dysentery and may attribute for death worldwide. Currently antibiotic resistance became the critical challenges for management of infectious disease. The aim was to conduct a systematic review and meta-analysis of *Shigella* species and its drug resistance pattern in Ethiopia.

Methods

A comprehensive literature search was conducted through internet searches using database of MEDLINE, PubMed, Google scholar, EMBASE, HINARI, Cochrane Library and reference lists of previous prevalence studies from January 1999 to November 2018. Results were presented in forest plot, tables and figures with 95% CI. The Cochrane Q test and I² test statistic were used to test heterogeneity across studies. The Pooled estimate of *Shigella* species and its drug resistance pattern was computed by a random effects model.

Results

The pooled prevalence of *Shigella* species in Ethiopia was 6.6% (95% CI 4.7–8.8). In the subgroup analysis, the highest prevalence was observed among patients in Health facility (8.5%, 95% CI 6.2–11.5) whereas the lowest prevalence was observed in Community based studies (1.6%, 95% CI 0.8–3.4). In addition, *Shigella* species were highly resistant to ampicillin, amoxicillin, erythromycin and multi-drug resistant (MDR) with the pooled resistance proportions of 83.1% (95% CI 75.7–88.6), 84.1% (95% CI 75.6–90.1), 86.5% (95% CI 70.9–94.4) and 83.2% (95% CI 77.1–87.9), respectively. On the other hand, comparably low resistance pattern was reported for ciprofloxacin 8.9% (95% CI 6.0–12.8), ceftriaxone 9.3% (95% CI 3.9–20.5), and norfloxacin 8.2% (95% CI 3.8–16.6) and gentamycin 17.3% (95% CI 11.2–25.9). Subgroup analyses indicated that study years were associated with a decreasing *Shigella* prevalence over time (p = 0.002).

Conclusion

The pooled estimate showed high burden of *Shigella* infection and its high proportion of drug resistance pattern to ampicillin, amoxicillin and erythromycin in Ethiopia. Therefore, initiating and scale up of performing drug susceptibility test for each shigellosis case, educate the community and health care providers on appropriate use of antibiotics need to be considered and strengthened.

Duko, B., Geja, E., Oltaye, Z., Belayneh, F., Kedir, A., & Gebire, M. (2019). Triage knowledge and skills among nurses in emergency units of Specialized Hospital in Hawassa, Ethiopia: Cross sectional study. *BMC Research Notes*, *12*(1), 1–4.

Abstract

Objective

This study was aimed to assess knowledge and skills of triage and associated factors among nurses in emergency department of Hawassa University Comprehensive Specialized Hospital, South Ethiopia. Institutional based cross-sectional study design was conducted among 101 nurses from March 1–30, 2018. The data was coded and entered to SPSS version 22.0. Descriptive statistics was done and Chi square test was done to show the association between independent variables and dependent variable.

Results

Among the study participants, 57.4% were female and 87% were in age group of \leq 30 years. 51.5% had low triage knowledge scores, with the mean score being 9.54 (SD = 2.317), 76.2% perceived their overall triage skill to be at good level, with mean score 95.75 (SD = 9.562). Working experience of study participants (χ^2 = 15.204, p < .01), Educational level of study participant (χ^2 = 22.148, p < .01) and triage experience (χ^2 = 13.638, p < .01) were factors associated with triage knowledge. Working experience (χ^2 = 7.944, p < .05) and triage experience (χ^2 = 6.264, p < .05) were factors associated with triage skill.

Ayalew, M., Workicho, A., Tesfaye, E., Hailesilasie, H., & Abera, M. (2019). Burden among caregivers of people with mental illness at Jimma University Medical Center, Southwest Ethiopia: A cross-sectional study. *Annals of General Psychiatry*, *18*(1), 10.

Abstract

Background

Burden of caregivers of people with mental illness (PWMI) is considered to be a negative impact of the care provided by the family to the patient. However, little is known about the extent of the burden among caregivers of PWMI in Ethiopia. The aim of this study, therefore, is to assess the magnitude and associated factors of burden among caregivers of PWMI at Jimma University Medical Center, 2017.

Methods

Institution-based cross-sectional study design was employed among 406 conveniently selected caregivers of PWMI and interviewed using a structured questionnaire. Family burden interview schedule (FBIS) was used to assess burden of caregivers. Bivariate and multivariable linear regression analyses were performed to determine the predictors of burden among caregivers. Results

Nearly two-thirds [264 (65.0%)] of the participants were male with a mean age of 38.45 ± 12.03 years. The mean score for burden among caregivers on family burden interview schedule was 23.00 ± 10.71 . Age of the caregivers ($\beta = 0.18$, p < 0.001), being female caregiver ($\beta = 2.68$, p < 0.01), duration of contact hours with the patient per day ($\beta = 0.74$, p < 0.001), perceived stigma by the caregiver ($\beta = 0.47$, p < 0.001), and providing care for patients who had history of substance use in life ($\beta = 1.52$, p < 0.05) were positive predictors of higher burden among caregivers. Whereas, caregivers' income ($\beta = 7.25$, p < 0.001), caregivers who had no formal education ($\beta = 4.65$, p < 0.01), and caregivers' social support ($\beta = 0.78$, p < 0.001) were negatively associated with higher burden among caregiver.

Conclusion

Caregivers of people with mental illness experience enormous burden during providing care for their relatives with mental illness. Therefore, creating community awareness and targeted interventions in the area of treatment access, stigma, financial, and other social support for people with mental illness and their caregivers would help out to reduce these burdens. Duko, B., Ayalew, M., & Ayano, G. (2019). The prevalence of alcohol use disorders among people living with HIV/AIDS: a systematic review and meta-analysis. *Substance Abuse Treatment, Prevention, and Policy*, 14(1), 52.

Abstract

Background

Alcohol use disorder (AUD) is common among people living with HIV/AIDS (PLWHA) and associated with a greater risk of poor medication adherence, unsafe sexual behaviors as well as poor quality of life. To our knowledge, there is no previous systematic review and meta-analysis that reported the pooled prevalence estimate of AUD among PLWHA. Therefore, this review aimed to systematically review the available studies on the prevalence of AUD among PLWHA and forward possible recommendations for future clinical practice and research.

Methods

PubMed, EMBASE, Psych INFO and SCOPUS databases were searched to identify the relevant studies. We have also scanned the reference lists of the eligible studies to supplement our electronic search. We used the Comprehensive Meta-Analysis software versions 3.0 to conduct a meta-analysis. Subgroup and sensitivity analysis were performed and Cochran's Q- and the I²- test were employed to see the heterogeneity. The presence of publication bias was explored by utilizing Egger's test and visual inspection of the symmetry in funnel plots.

Results

A total of 25 studies with 25,154 participants across developed and developing countries were included in the final analysis. Our meta-analysis revealed that the pooled prevalence estimate of AUD among PLWHA was found to be 29.80% (95% CI; 24.10–35.76). The prevalence of AUD was higher in males (26.90%) than female (13.37%) HIV patients. In this study, the pooled prevalence of AUD was considerably higher (31.52%) when measured by Alcohol Use Disorders Identification Test (AUDIT) as compared to Composite International Diagnostic Interview (CIDI) (13.51%). In addition, the pooled prevalence of AUD was higher in the developed countries (42.09%) while lower for developing countries (24.52%).

Conclusion

In the current study, the pooled prevalence estimates of AUD among PLWHA was considerably high (29.80%). Screening and appropriate management of AUD among PLWHA are recommended.

Tadesse, B., Shimelis, T., & Worku, M. (2019). Bacterial profile and antibacterial susceptibility of otitis media among pediatric patients in Hawassa, Southern Ethiopia: Cross-sectional study. *BMC Pediatrics*, *19*(1), 398.

Abstract

Background

Otitis Media (OM) is the most common disease of childhood. Twenty thousand people die each year from otitis media. It is an important cause of preventable hearing loss, affects children's intellectual performance and language development. There are very small numbers of studies done in Ethiopia concerning this topic. This study aimed to identify bacterial pathogens related to ear infection and to assess antibacterial susceptibility of isolated organisms.

Method

A cross-sectional study was conducted on 152 children from April 2018 to July 2018 at selected health facilities in Hawassa city, SNNPR, Ethiopia. All pediatric patients having ear discharge were included. Convenient sampling technique was used to collect clinical and demographic data using standard questionnaires after child care-takers signed the consent. Ear discharge specimens were collected using a sterile swab, and transported using Amies transport media to Hawassa University Comprehensive Specialized Hospital laboratory. Bacterial isolates were characterized based on colony appearance, Gram reaction, culture characteristics, and biochemical tests after inoculating on appropriate culture media. Antibacterial susceptibility testing was performed using the disc diffusion method according to the criteria of the Clinical and Laboratory Standards Institute (CLSI).

Results

Among 152 children included, 115(75.6%) of them demonstrated pathogenic bacterial growth. *Staphylococcus aureus* 41(27%) was the most frequently isolated pathogen, followed by *Proteus mirabilis* 19 (12.5%). Of the total isolates, 11.2 and 7.3% were resistant to gentamicin and ciprofloxacin respectively. Over three-fourth (85.2%) of the isolates were resistant to ampicillin. More than two-third of the isolates were resistant to both penicillin (71.4%) and trimethoprim-sulphamethoxazole (72.0%).

Conclusions

S. aureus is the most commonly isolated bacterial pathogen from ear discharge among children. Even though gentamicin is a parenteral drug and ciprofloxacin is rarely used in children due to concerns of bone/joint effects, these two drugs were highly effective antibiotics and thus should be considered in treating children with otitis media since most organisms were resistance or poor response to first line drugsHigh level of antibiotic resistance was observed so antimicrobial susceptibility test is needed before prescribing drugs for treatment of OM.

Wochebo, W., Haji, Y., & Asnake, S. (2019). Scabies outbreak investigation and risk factors in Kechabira district, Southern Ethiopia: Unmatched case control study. *BMC Research Notes*, *12*(1), 1–6.

Abstract

Objective

Scabies is an infection of the skin, which caused by human itch mite *Sarcoptes scabiei*. It is a common health problem in Ethiopia, especially during disasters, poor sanitation and overcrowded living condition. However, investigation on scabies outbreak and associated factors was absent or scarce in the country in general and in the study area in particular. Hence, this study was intended to investigate scabies outbreak, identify risk factors, and recommend preventive measures in Kechabira district, Kembata Tembaro zone, Southern Ethiopia.

Result

We identified a total of 243 scabies cases line listed with overall prevalence of 2.5% and attack rate of (AR) 20.5 per 1000 populations and no death was reported. Of the suspected cases 126 (51.9%) were males and 117 (48.1%) were females. The median age was 24 years with interquartile range (IQR) of 22 years. The highest cases were seen in children aged 5–14 (50.6%) years. The cases were seen in three villages and the highest incidence was in Burchana, 23.9 per 1000 population. Identified determinant factors for scabies outbreak were sharing clothes with scabies patients (AOR = 6.08, 95% CI [1.54–23.92], and households having greater than six family members AOR = 38.755, 95% CI [8.084–185.787]. Solomon, T., Loha, E., Deressa, W., Gari, T., Overgaard, H. J., & Lindtjørn, B. (2019b). Low use of long-lasting insecticidal nets for malaria prevention in south-central Ethiopia: A community-based cohort study. *PLoS One*, *14*(1), e0210578.

Abstract

Introduction

A decline in malaria morbidity and mortality has been documented in Ethiopia since 2005 following a scale-up of the distribution of long-lasting insecticidal nets (LLINs). However, universal access to LLINs ownership and use has not yet been achieved. This study aimed to determine ownership and use of LLINs over time in south-central Ethiopia.

Methods

A cohort of 17,142 individuals residing in 3,006 households was followed-up from October 2014 to January 2017 (121 weeks). New PermaNet2.0 LLINs were given to households in October 2014. Once per week, the LLIN use status was documented for each individual. A survey was conducted after 110 weeks of LLIN distribution to determine LLIN ownership. A multilevel negative binomial regression model was fitted to identify significant predictors of LLIN use.

Results

At baseline, the LLIN ownership was 100%. After 110 weeks only 233 (8%) of the households owned at least one LLIN. The median proportion of LLIN use per individuals during the study period was only 14%. During the first year (week 1–52) the average LLIN use per individuals was 36% and during the second year (week 53–104) it was 4.6%. More frequent LLIN use was reported among age group [5–14 years (adjusted IRR = 1.13, 95% CI 1.04–1.22), 15–24 years (adjusted IRR = 1.33, 95% CI 1.23–1.45), \geq 25 years (adjusted IRR = 1.99, 95% CI 1.83–2.17)] compared to <5 years, and household head educational status [read and write (adjusted IRR = 1.17, 95% CI 1.09–1.26), primary (adjusted IRR = 1.20, 95% CI 1.12–1.27), secondary or above (adjusted IRR = 1.20, 95% CI (1.11–1.30)] compared to illiterate. Having a family size of over five persons (adjusted IRR = 0.78, 95% CI 0.73–0.84) was associated with less frequent use of LLINs compared to a family size of \leq 5 persons.

Conclusions

The study showed a low LLIN ownership after 110 weeks and a low LLIN use during 121 weeks of follow-up, despite 100% LLIN coverage at baseline. The study highlights the need to design strategies to increase LLIN ownership and use for setting similar to those studied here.

Loha, E., Deressa, W., Gari, T., Balkew, M., Kenea, O., Solomon, T., Hailu, A., Robberstad, B., Assegid, M., & Overgaard, H. J. (2019). Long-lasting insecticidal nets and indoor residual spraying may not be sufficient to eliminate malaria in a low malaria incidence area: Results from a cluster randomized controlled trial in Ethiopia. *Malaria Journal*, *18*(1), 141.

Abstract

Background

Conflicting results exist on the added benefit of combining long-lasting insecticidal nets (LLINs) with indoor residual spraying (IRS) to control malaria infection. The main study objective was to evaluate whether the combined use of LLINs and IRS with propoxur provides additional protection against *Plasmodium falciparum* and/or *Plasmodium vivax* among all age groups compared to LLINs or IRS alone.

Methods

This cluster-randomized, controlled trial was conducted in the Rift Valley area of Ethiopia from September 2014 to January 2017 (121 weeks); 44 villages were allocated to each of four study arms: LLIN + IRS, IRS, LLIN, and control. Each week, 6071 households with 34,548 persons were surveyed by active and passive case detection for clinical malaria. Primary endpoints were the incidence of clinical malaria and anaemia prevalence.

Results

During the study, 1183 malaria episodes were identified, of which 55.1% were *P. falciparum* and 25.3% were *P. vivax*, and 19.6% were mixed infections of *P. falciparum* and *P. vivax*. The overall malaria incidence was 16.5 per 1000 person-years of observation time (PYO), and similar in the four arms with 17.2 per 1000 PYO in the LLIN + IRS arm, 16.1 in LLIN, 17.0 in IRS, and 15.6 in the control arm. There was no significant difference in risk of anaemia among the trial arms. Conclusions

The clinical malaria incidence and anaemia prevalence were similar in the four study groups. In areas with low malaria incidence, using LLINs and IRS in combination or alone may not eliminate malaria. Complementary interventions that reduce residual malaria transmission should be explored in addition to LLINs and IRS to further reduce malaria transmission in such settings.

Solomon, T., Loha, E., Deressa, W., Gari, T., & Lindtjørn, B. (2019a). Spatiotemporal clustering of malaria in southern-central Ethiopia: A community-based cohort study. *PloS One*, *14*(9), e0222986.

Abstract

Introduction

Understanding the spatiotemporal clustering of malaria transmission would help target interventions in settings of low malaria transmission. The aim of this study was to assess whether malaria infections were clustered in areas with long-lasting insecticidal nets (LLINs) alone, indoor residual spraying (IRS) alone, or a combination of LLINs and IRS interventions, and to determine the risk factors for the observed malaria clustering in southern-central Ethiopia.

Methods

A cohort of 34,548 individuals residing in 6,071 households was followed for 121 weeks, from October 2014 to January 2017. Both active and passive case detection mechanisms were used to identify clinical malaria episodes, and there were no geographic heterogeneity in data collection methods. Using SaTScan software v 9.4.4, a discrete Poisson model was used to identify high rates of spatial, temporal, and spatiotemporal malaria clustering. A multilevel logistic regression model was fitted to identify predictors of spatial malaria clustering.

Results

The overall incidence of malaria was 16.5 per 1,000 person-year observations. Spatial, temporal, and spatiotemporal clustering of malaria was detected in all types of malaria infection (*P. falciparum*, *P. vivax*, or mixed). Spatial clustering was identified in all study arms: for LLIN + IRS arm, a most likely cluster size of 169 cases in 305 households [relative risk (RR) = 4.54, P<0.001]; for LLIN alone arm a cluster size of 88 cases in 103 households (RR = 5.58, P<0.001); for IRS alone arm a cluster size of 58 cases in 50 households (RR = 7.15, P<0.001), and for control arm a cluster size of 147 cases in 377 households (RR = 2.78, P<0.001). Living 1 km closer to potential vector breeding sites increased the odds of being in spatial clusters by 41.32 fold (adjusted OR = 41.32, 95% CI = 3.79-138.89).

Conclusions

The risk of malaria infection varied significantly between *kebeles*, within *kebeles*, and even among households in areas targeted for different types of malaria control interventions in low malaria

transmission setting. The results of this study can be used in planning and implementation of malaria control strategies at micro-geographic scale.

Kassa, Z. Y., & Husen, S. (2019). Disrespectful and abusive behavior during childbirth and maternity care in Ethiopia: A systematic review and meta-analysis.BMC Research Notes, 12, (1) 1–6.

Abstract

Objective

Disrespectful and abusive behavior during childbirth and maternity care is violation of fundamental right of women and unborn child. There is scarce of data on disrespectful and abusive behavior during childbirth and maternity care in Ethiopia. The aim of this study was to determine disrespectful and abusive behavior during childbirth and maternity care in Ethiopia.

Results

Seven studies were included in this meta-analysis of disrespectful and abusive behavior during childbirth and maternity care. The pooled prevalence of disrespect and abuse care during childbirth and maternity care was 49.4% (95% CI 30.9–68.1). Whereas physical abuse was 13.6% (95% CI 5.2–31.2), non-confidential care was 14.1% (95% CI 7.3–25.4), abandonment care was 16.4% (95% CI 14.7–18.2), and detention was 3.2% (95% CI 0.9–11.5). This study showed that disrespectful and abusive behavior during child birth and maternity care is high. Whereas, abandonment care is high. This study indicates that health care providers shall not leave women during childbirth and maternity care and listen women, federal minister of health and regional health bureau also identifying root of cause disrespect and abuse and to alleviate mistreatment during childbirth and maternity care.

Sara, J., Haji, Y., & Gebretsadik, A. (2019). Determinants of Maternal Death in a Pastoralist Area of Borena Zone, Oromia Region, Ethiopia: Unmatched Case-Control Study. Obstetrics and Gynecology International.

Abstract

Background. Globally, more than 830 maternal deaths happen daily, and nearly, all of these occur in developing countries. Similarly, in Ethiopia, maternal mortality is still very high. Studies done in pastoralist women are almost few. Therefore, the objective of this study was to assess the

determinant factors of maternal death in the pastoralist area of Borena zone, Oromia region, Ethiopia. Methods. Community-based unmatched case-control study was conducted on 236 mothers (59 maternal deaths (cases) and 177 controls). The sample included pregnant women aged 15-49 years from September 2014 to March 2017. Data were collected using a structured questionnaire adapted from Maternal Death Surveillance and Response Technical Guideline, entered into the EpiData, exported into SPSS for analyses. Odds ratios (ORs) and 95% confidence interval (CI) were computed to determine contributing factors of maternal death and control potential confounding variables. *Results*. About 51 (86%) of all maternal deaths were due to direct obstetric causes. Of this, hemorrhage (45%), hypertensive disorders of pregnancy (23%), and obstructed labor (18%) were the leading direct causes of maternal deaths. Husbands who had no formal education were 5 times higher compared with their counterparts (AOR = 5.1, 95% CI: 1.6– 16). Mothers who were not attending ANC were 5 times more at risk for death than those who attend (AOR 5.3, 95% CI 2.3–12.1). Mothers who gave birth at home/on transit were twice to die compared to health facility delivery (AOR 2.6, 95% CI 2.4-6) that were contributing factors of maternal deaths. Conclusions. Husband's level of education, lack of antenatal care, and home delivery were the factors contributing to maternal deaths in the zone. Frequent and tailored antenatal care, skilled delivery, and access to education also need due attention.

Gebretsadik, A., Teshome, M., Mekonnen, M., Alemayehu, A., & Haji, Y. (2019). Health Extension Workers Involvement in the Utilization of Focused Antenatal Care Service in Rural Sidama Zone, Southern Ethiopia: A Cross-Sectional Study. *Health Services Research and Managerial Epidemiology*, *6*, 233392819835138.

Abstract

Background:

Health extension workers (HEWs) are primarily been assigned in rural areas of Ethiopia to provide maternal and child health services. Few studies have been done to investigate HEWs' contributions towards maternal health services. This study describes HEWs involvement in the utilization of focused antenatal care (FANC).

Methods: A population-based cross-sectional survey was conducted between January 21 and February 4, 2017. Mothers (2300) who gave birth in the last 6 months (0-6 months) in randomly selected 30 kebeles in the rural Sidama zone, participated in the study. A face-to-face interview

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was done using a structured questionnaire adapted from the Saving Newborn Lives Program. The main outcome variable was FANC utilization. Descriptive statistics and multivariate logistic regression analysis were used using SPSS statistical software.

Results: The FANC was used by 525 (24.36%; 95% confidence interval [CI]: 22.5%-26.2%) women. Health extension workers accounted for 244 (46.47%; 95% CI: 43.5-47.7%) of mothers. The FANC utilization was less likely among those who were illiterate (adjusted odds ratio [AOR]: .32; 95% CI: .18-.57) and those who attended first cycle (AOR: .41; 95% CI: .23-.74), those who attended secondary cycle (AOR: .47; 95% CI: .27-.82), primipara (AOR: 0.53; 95% CI: .35-.83), and those who gave birth at home (AOR: .66; 95% CI: .51-.84). Mothers who had knowledge of pregnancy danger signs (AOR: 1.42; 95% CI: 1.2-1.7) and exposure to mass media (AOR: 1.35; 95% CI: 1.1-1.66) were more likely to utilize FANC.

Conclusions: FANC utilization in this study was low compared to other studies. The HEWs had a major contribution to the services. However, it is low when compared to the plan set by the state ministry of health. The existing health extension program could be strengthened by increasing the number of HEWs. Empowering rural mothers through continuous education program to enhance the utilization of maternal health services.

Keywords: Focused antenatal care, Utilization, Health extension workers involvement, Rural sidama Ethiopia

Gebretsadik, A., Tarekegne, Z., & Teshome, M. (2019). Retrospective review of maternal deaths in Hawassa Comprehensive Specialised Hospital, in Southern Ethiopia. Journal of Obstetrics and Gynaecology, Pages 1–7.

Abstract

The aim of this study was to evaluate the causes of and contributors to maternal death at Hawassa Referral Comprehensive Specialised Hospital (HRCSH). A health facility–based, maternal death review was used. All maternal deaths that occurred between January 2016 and August 2017 in HRCSH were included. Data were collected using a structured data collection sheet and analysed. Eighty-two maternal deaths that occurred over a 20-month period were reviewed, of which 77 met the inclusion criteria. A total of 8466 births occurred in HRCSH during the study period. The overall facility-based maternal mortality rate (MMR) was 910 deaths per 100,000 live births. The
majority of maternal deaths (69 deaths; 89.6%) were due to direct causes, with pregnancy-induced hypertension as the leading direct cause of 33 deaths (42.8%). Eight avoidable factors were identified in this review. Twenty-six patients (33.9%) died as a result of a combination of three or more factors. Patient-oriented and transport/referral factors were the most common avoidable factors, with each contributing to 62 deaths (80.5%). Prenatal patients would benefit from receiving information regarding danger signs that could assist in the early detection of health problems and increase the likelihood that they seek health care.

Mereta, S., Ambelu, A., Ermias, A., Abdie, Y., Moges, M., Haddis, A., Hailu, D., Beyene, H., Kebede, B., & Mulat, W. (2019). Effects of untreated industrial effluents on water quality and benthic macroinvertebrate assemblages of Lake Hawassa and its tributaries, Southern Ethiopia. *African Journal of Aquatic Science*, 1–11.

Abstract

The present study investigates the impacts of industrial effluents on the macroinvertebrate assemblages and water quality of the Lake Hawassa watershed. The water quality and macroinvertebrate assemblages were assessed at 40 sampling sites. The chemical and ecological water quality was evaluated using the Basic Prati index and the Ethiopian Biological Score Index (ETHbios), respectively. Canonical Correspondence Analysis (CCA) was used to evaluate the relationship between abiotic factors and macroinvertebrate metrics. A total of 5 876 invertebrates belonging to twentyfive families were recorded. The Coleoptera was the most dominant order represented by four families with a relative abundance of 68%. According to the ETHbios score <12), whereas the upstream sites had moderate to good water quality (ETHbios 53 to 76). Likewise, the Basic Prati Index of the sites receiving industrial effluent was considered as very heavily polluted (Index score >8). Overall, the industrial effluents had a significant negative impact on water quality and macroinvertebrate diversity. Therefore, proper management of industrial effluent is urgently needed to prevent further deterioration of water quality and loss of biodiversity in the Lake Hawassa and Shallo Wetland ecosystems.

Keywords: Basic Parti Index; Ethiopian Biological Score Index; Macroinvertebrates; wetlands

Mudesir, A., Hailu, D., & Chichiabellu, T. (2019). Magnitude and Associated Factors of Injuries Among Patients Visting the Emergency Surgical Department of Yirgalem General Hospital. *Academic Journal of Nursing and Health Education*, 8(1), 57–63.

Abstract

Background: Globally, trauma is recognized as one of the most life threatening public health problems. Traumatic injuries account for 12% of the global burden of diseases and are the third most important cause of overall mortality. The aim of this study was to assess magnitude and associated factors of injuries among patients visiting the Emergency Surgical Department of Yirgalem General Hospital. Methods: An institution based cross- sectional study design that employed a two years retrospective chart review was conducted in September 1-30, 2015 in Yirgalem General Hospital, Southern Ethiopia. Data were coded, entered, processed and analyzed by using Epi info version 7 and exported to SPSS version 20software for analysis. Bivariate and multivariate analysis was done to identify factors associated with magnitude of injury. Odds ratios with 95 % confidence interval were computed to determine the level of significance. Result: In this study the magnitude of injury was 59.5 %. Unintentional injuries were the primary causes for 178 (82 %) of cases. Road traffic accident was responsible for 98 (55.7 %) of unintentional injuries and 109 (50.2 %) of patients suffered moderate injuries that needed skilled treatment. The higher proportion, 108 (49.8 %) of injury occurred on the road. Being male (AOR =2.82; 95 % CI=1.80 - 4.40), age < 19 (AOR = 4.03; 95 % CI= 1.88 - 8.62) and age 20-44 (AOR = 2.69; 95 % CI=1.36) - 5.30)) were significantly associated with injury. Conclusion: The magnitude of injury was high. According to this study being male and age were factors associated with injury. Awareness should be created on the community by different social Medias about traffic rules and regulations. Traffic police should control travelers to use safety features while traveling.

Deyno, S., Eneyew, K., Seyfe, S., Tuyiringire, N., Peter, E. L., Muluye, R. A., Tolo, C. U., & Ogwang, P. E. (2019). Efficacy and safety of cinnamon in type 2 diabetes mellitus and prediabetes patients: A meta-analysis and meta-regression. *Diabetes Research and Clinical Practice*, 156, 107815.

Abstract

Introduction

Cinnamon has been used as a dietary component and in the management of diabetes mellitus. This study systematically reviewed and synthesized evidence on the efficacy of cinnamon for the treatment of type 2 diabetes mellitus (T2DM) and pre-diabetes patients.

Methods

Databases of Web of Sciences, the Cochrane library, PubMed, CINAHL and SCOPUS were searched. Stata version 13 (College Station, Texas 77845 USA) and RevMan var. 5.3 software were used for meta-analysis. Heterogeneity was assessed using Chi-square and I² tests.

Results

Sixteen randomized controlled studies were included in the meta-analysis. Cinnamon significantly reduced fasting blood glucose (FBG) and homeostatic model assessment for insulin resistance (HOMA-IR) level compared to placebo with weighted mean difference (WMD) of -0.545 (95% CI: -0.910, -0.18) mmol/L, I² = 83.6% and -0.714(-1.388, -0.04), I² = 84.4% respectively. There was no significant change in weighted mean difference of glycosylated hemoglobin A1C (HbA1c) % and lipid profiles (mmol/L). Meta-regression did not show any factor significantly affecting the treatment response.

Conclusion

Cinnamon reduced FBG and HOMA-IR, level in T2DM and pre-diabetes patients compared to placebo. High heterogeneity observed among included studies warrants further clinical trials after standardization of cinnamon formulation.

Anja, A., Beyene, G., & Daka, D. (2019). Asymptomatic pharyngeal carriage rate of Streptococcus pyogenes, its associated factors and antibiotic susceptibility pattern among school children in Hawassa town, southern Ethiopia. *BMC Research Notes*, *12*(1), 564.

Abstract

Objectives

The aim of this study was to determine the asymptomatic pharyngeal carriage rate of *S. pyogenes*, antimicrobial pattern and related risk factors among school children in Hawassa, southern Ethiopia.

Results

Out of 287 school children's screened, 35 (12.2%) were colonized with *S. pyogenes*. The carriage rate was significantly associated with factors such as sex (female p = 0.013) occupational status of mother (p = 0.002), lower income source (500–900 ETB, 1000–1500 ETB) (p = 0.001, and p = 0.042), history of hospitalization (p = 0.00) and residence of the children (p = 0.002). High level resistant to tetracycline and low level to vancomycin were observed, while penicillin, amoxicillin, erythromycin, chloramphenicol, and ceftriaxone were found to be effective.

Taye, M., Daka, D., Amsalu, A., & Hussen, S. (2019). Magnitude of hepatitis B and C virus infections and associated factors among patients scheduled for surgery at Hawassa University comprehensive specialized Hospital, Hawassa City, southern Ethiopia. *BMC Research Notes*, *12*(1), 412.

Abstract

Objective

The aim of this study was to assess the magnitude of HBV and HCV infection and its associated factors among surgical patients at Hawassa University comprehensive specialized Hospital Hawassa City, southern Ethiopia.

Result

In this study, the prevalence of HBsAg and Anti-HCV among patients scheduled for surgery were 9% and 5.5%, respectively. Patients who practiced multiple sexual partner (AOR = 2.58, CI 1.18– 5.61), dental procedure (AOR = 4.20, CI 1.87–9.55) and blood transfusion (AOR = 3.84, CI 1.27– 11.65) had higher odds of HBV infection and those who had history of surgical procedure

(AOR = 6.05: 95% CI 1.59-23.04) and dental procedure (AOR = 3.70: 95% CI 1.40-9.77) had higher odds of HCV infection.

Haile, A. A., Gidebo, D. D., & Ali, M. M. (2019). Colonization rate of Streptococcus pneumoniae, its associated factors and antimicrobial susceptibility pattern among children attending kindergarten school in Hawassa, southern Ethiopia. *BMC Research Notes*, *12*(1), 1–7.

Abstract

Objective

The aim of this study was to determine the colonization rate of *Streptococcus pneumoniae*, antimicrobial susceptibility pattern and associated risk factors among children attending kindergarten school in Hawassa, Ethiopia.

Results

Out of 317 study participants, 68 (21.5%) were colonized with *S. pneumoniae*. Colonization rate was significantly associated with factors such as age (3 to 4 years old) (P = 0.01), having a sibling whose age was less than 5 years (P = 0.011), sharing a bed with parents (P = 0.005), cooking within bedroom (P = 0.002), and previous hospitalization (P = 0.004). Forty-four (64.6%), 33 (48.5%), and 2942.6%) of *S. pneumoniae* isolated were resistant to cotrimoxazole, penicillin, and tetracycline respectively.

WoldeKidan, E., Daka, D., Legesse, D., Laelago, T., & Betebo, B. (2019). Prevalence of active trachoma and associated factors among children aged 1 to 9 years in rural communities of Lemo district, southern Ethiopia: Community based cross sectional study. *BMC Infectious Diseases*, *19*(1), 886.

Abstract

Background

Trachoma, caused by *Chlamydia trachomatis* is the leading infectious cause of blindness. It is transmitted via personal contact with infected ocular and nasal secretions by hands, fomites and eye- seeking flies. Active trachoma is more common among children aged 1 to 9 years. The

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objective of this study was determining the prevalence of active trachoma and associated factors among children aged 1 to 9 years in rural community of Lemo district.

Methods

Community-based cross-sectional study was conducted from March to April, 2018 in rural community of Lemo district. Multistage sampling technique was used to select 589 study participants. Data were collected by using structured pre-tested questionnaire, physical examination and observation. Binocular loupe was used to identify active trachoma cases. The data were entered by using EPi-data version 3.1 and analyzed by SPSS. Binary logistic regression was used to assess factors associated with active trachoma. Variables with *p*-value < 0.05 in the multivariable analysis were used to declare significance of association.

Result

Eighty seven (15.2%) children were positive for active trachoma. Absence of solid waste disposal pit (AOR = 2.20, 95% CI (1.12-4.37), do not use latrine as reported by respondent (AOR = 7.53, 95% CI (2.86-19.84), do not use soap for face washing as reported by respondent (AOR = 2.3, 95% CI (1.32–4.12), washing face frequency as reported by respondent (AOR = 1.86, 95% CI (1.06–3.26), and family size greater than five (AOR = 1.96, 95% CI (1.06–3.67) were significantly associated with active trachoma.

Conclusion

Active trachoma among children aged 1 to 9 years is high. Do not use latrine, do not use soap for face washing, and face washing frequency in a day as reported by respondents and family size were associated with active trachoma. Access to adequate water and sanitation can be important components in working towards eliminating trachoma as a public health problem. Therefore, prompt measures must be taken by concerned bodies to increase access to adequate water and sanitation facilities.

Zekewos, A., Egeno, T., & Loha, E. (2019). The magnitude of hypertension and its risk factors in southern Ethiopia: A community based study. *Plos One*, *14*(8), e0221726.

Abstract

Background

Prevention and control of hypertension has not been given due attention though previous studies indicated that hypertension is growing public health problem.

Objective

This study aimed to determine the prevalence of hypertension and associated factors in Bona district, southern Ethiopia.

Methods

A community based cross-sectional study was conducted on 1952 participants aged \geq 25 years in Bona District, southern Ethiopia. Data were collected from consented participants recruited using multistage sampling technique. Data were entered, checked for quality and analyzed by SPSS for Windows version 20.0. Since the outcome variables were ordered categorical, we used multinomial logistic regression model to identify associated factors. Among the independent variables included in the model no multicolinearity was observed. The level of significance was set at P value ≤ 0.05 .

Results

The observed prevalence of hypertension (21.8%) was remarkable in rural setting. Out of hypertensive participants, 195 (45.9%) were newly diagnosed. About one third of the participants (31.4%) had central obesity measured by waist-to-height ratio ≥ 0.50 . Being male, age advancement, high BMI ($\geq 25.0 \text{ kg/m}^2$) and central obesity (waist-to-height ratio ≥ 0.50) were positively associated with both systolic and diastolic hypertension. Systolic hypertension was negatively associated with high family income. The likely hood of developing diastolic hypertension increased in participants with family history of hypertension.

Conclusion

The overall prevalence of hypertension, 21.8%, is alarmingly high that it can be said that hypertension is becoming a silent epidemic in Ethiopia. Nationwide survey is needed to get the clear magnitude of hypertension so that early detection and management strategies can be enforced.

Ayano, G., Yohannis, K., Abraha, M., & Duko, B. (2019). The epidemiology of alcohol consumption in Ethiopia: A systematic review and meta-analysis. *Substance Abuse Treatment, Prevention, and Policy*, 14(1), 26.

Abstract

Background

Globally, excessive alcohol consumption is a major public health problem and is associated with social, mental, physical and legal consequences. However, no systematic review and meta-analysis has been performed to report the consolidated magnitude of alcohol consumption in Ethiopia. Methods

PubMed, EMBASE, and SCOPUS were systematically searched to identify pertinent studies. Subgroup and sensitivity analysis was conducted and Cochran's Q- and the I^2 test were used to assess heterogeneity. Publication bias was evaluated by using Egger's test and visual inspection of the symmetry in funnel plots.

Results

We included 26 articles with a total of 42,811 participants. The pooled current and lifetime prevalence of alcohol consumption was 23.86% (95%CI; 17.53–31.60) and 44.16% (95%CI; 34.20–54.62), respectively. The pooled prevalence of hazardous alcohol consumption was 8.94% (95%CI; 3.40–21.50). The prevalence of hazardous alcohol consumption was remarkably higher in men (11.58%) than in women (1.21%). The prevalence of current and lifetime alcohol consumptions among university students were 22.08% & 38.88% respectively. The pooled data revealed that male sex was found to be a significant predictor of hazardous alcohol consumption (OR 10.38; 95%CI 3.86 to 27.88) as well as current (OR 2.45; 95%CI 1.78 to 3.38) and lifetime (OR 2.14; 95%CI 1.39 to 3.29) consumption. The magnitude of alcohol consumption among university students was apparently lower than the magnitude in other population of the country. The current study suggested a remarkable recent increment in the magnitude of hazardous alcohol consumption in Ethiopia.

Conclusion

The current study revealed that the prevalence of alcohol consumption in Ethiopia is comparable with the global estimates of alcohol consumption from the World Health Organization (WHO). The prevalence of hazardous alcohol consumption was remarkably higher in men (11.58%) than

in women (1.21%). Male sex was found to be a significant predictor of alcohol consumption. The present study also suggested considerable recent increment in the magnitude of hazardous alcohol consumption in Ethiopia.

Duko, B., Melese, Y., & Ebrahim, J. (2019). Determinants of cigarette smoking among adolescents in Ethiopia: A cross-sectional study. *Tobacco Induced Diseases*, 17.

Abstract

INTRODUCTION

Cigarette smoking is an important health hazard and major preventable cause of morbidity and mortality. This study aimed to assess the prevalence of cigarette smoking among Tabor secondary and preparatory school students in Hawassa City, Ethiopia, 2018.

METHODS

A school-based cross-sectional study was conducted among 564 students aged 15–22 years using simple random sampling techniques, in the period 5–19 March 2018. Global Youth Tobacco Survey (GYTS) was used to assess smoking behaviours. Logistic regression analyses were employed to identify factors associated with cigarette smoking.

RESULTS

The student prevalence of cigarette smoking was found to be 11% (95% CI: 8.5–13.9) of which 9.4% were current smokers. The proportion of cigarette smoking among male and female students was 8.2% and 2.8%, respectively. An age \geq 18 years (AOR = 3.0, 95% CI: 1.29–7.00), students having friends who smoke (AOR= 4.04, 95% CI: 2.04–7.45), khat chewing (AOR=5.57, 95% CI: 2.44–12.76), alcohol consumption (AOR=4.14, 95% CI: 1.84–9.70) and illegal or illicit drug use (AOR=5.84, 95% CI: 1.96–17.36) were found to be significantly associated with cigarette smoking.

CONCLUSIONS

Cost-effective programs that involve the participation of families, teachers and other stakeholders to deliver health education and which restrict accessibility, advertising and use of substances like alcohol, cigarettes, and other illicit drugs, are highly recommended.

Kassahun, G., Wakgari, N., & Abrham, R. (2019). Patterns and predictive factors of unhealthy practice among mothers during pregnancy, childbirth, postnatal and newborn care in Southern Ethiopia: A community based cross-sectional study. *BMC Research Notes*, *12*(1), 1–6.

Abstract

Objective: the aim of this study was to assess the magnitude, patterns and predictive factors of unhealthy practice among mothers during pregnancy, childbirth, postnatal and newborn care in Southern Ethiopia. Results: among the total participants, 29.0% mothers performed at least one unhealthy practice during pregnancy, childbirth, postnatal period and newborn care. This study identified the following harmful practices such as food prohibition (53.2%), home delivery (41.5%), discarding colostrum (18.6%), application of substance on the cord stump (12.1%), delayed breast feeding (28.4%), prelacteal feeding (43.0%) and early bathing (49.3%). Being grand multiparous (AOR = 2.528, 95% CI 1.037–6.166), being illiterate (AOR = 7.611, 95% CI 2.375–24.396) and lack of awareness on the effect of unhealthy practice (OR = 4.673, 95% CI 1.163–18.774) were independent predictors of outcome variable.

Peter, E. L., Kasali, F. M., Deyno, S., Mtewa, A., Nagendrappa, P. B., Tolo, C. U., Ogwang, P. E., & Sesaazi, D. (2019). Momordica charantia L. lowers elevated glycaemia in type 2 diabetes mellitus patients: Systematic review and meta-analysis. *Journal of Ethnopharmacology*, 231, 311–324.

Abstract

Ethnopharmacological relevance

Momordica charantia Linnaeus (Cucurbitaceae) has been extensively used traditionally as food and herbal medicine for type 2 diabetes mellitus in Asia, Brazil, and east Africa. *In vitro* and in vivo studies suggest its glycemic control potential; however, clinical studies produced conflicting results.

Aim of the study

To evaluate the efficacy of *M. charantia* preparations in lowering elevated plasma glucose level in prediabetes and type 2 diabetes mellitus patients.

Methods

Electronic search of the Cochrane library, PubMed®, CINAHL, and SCOPUS databases was done from 1st January 1960–30th April 2018 without language restriction. Two independent reviewers

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extracted data and assessed risk of bias of articles. Revman var. 5.3 software was used for data synthesis in meta-analysis. Heterogeneity was assessed using Chi-square and I^2 tests. Treatment effect was estimated using mean difference at follow up in outcome measures between *M. charantia* preparations and placebo or oral hypoglycemic agents control group. The protocol of this study has a registration number PROSPERO CRD42018083653.

Results

Ten studies of type 2 diabetes mellitus (n = 1045) were included in the meta-analysis. They had 4– 16 weeks follow up and overall moderate to high risk of bias. Compared to placebo, *M. charantia* monoherbal formulation significantly reduces FPG, PPG and HBA_{1c} with mean difference of -0.72 mmol/L, (95% CI: -1.33, -0.12), I² = 14%, -1.43 mmol/L, (95% CI: -2.18, -0.67), I² = 0, -0.26%, (95% CI: -0.49, -0.03), I² = 0 respectively. *M. charantia* also lowered FPG in prediabetes (mean difference -0.31 mmol/L, n = 52); the evidence was downgraded to low quality because the study had unclear risk of bias and inadequate sample size. No serious adverse effects were reported.

Conclusion

M. charantia adjunct preparations improved glycemic control in T2DM patients. However, this conclusion is based on low to very low quality evidences for the primary outcomes and sparse data for several safety outcomes, thus, warrant further research. Particularly needed are the researches that focus on standardizing *M. charantia* formulation and determine its efficacy and safety in clinical trials with adequate sample size, designed with random sequence generation, allocation concealment of intervention and blinding of both research personnel and participants.

Mtewa, A. G., Deyno, S., Peter, E. L., Amanjot, A., Ahovegbe, L. Y., & Sesaazi, D. C. (2019). Neurochemistry and Pharmacology of Addictions: An African Perspective. In *Addiction in South and East Africa* (pp. 175–192). Springer.

Abstract

The aim of this chapter is to outline general chemical and pharmacological mechanisms involved in addictions, African participation in neuroscience research and studies as well as challenges and opportunities in the continent. African indigenous practices are known from history to be able to use herbs to counter addictions at various levels. There is generally limited data on this area of study on Africa, where addictions are almost ignored as a public health concern. Despite this being the case, Africa presents a pool of opportunities in research on neurochemisty with focus on addictions. Chemistry and pharmacology can play a significant role in providing guidance on appropriate social and medical interventions. Systematic investment in neurochemistry and pharmacology in addiction research and training in Africa is required across the continent.

Degefa, N., Tadesse, H., Aga, F., & Yeheyis, T. (2019). Sick Child Feeding Practice and Associated Factors among Mothers of Children Less Than 24 Months Old, in Burayu Town, Ethiopia. *International Journal of Pediatrics*, 2019.

Abstract

Background. Growing evidence suggests that inadequate intake, poor caring practices, and disease process were some of the immediate and major causes of undernutrition in children. This points out that infant and young child feeding were the basic grounds to improve child survival and promote healthy growth and development. The first two years of a child's life are particularly important, as optimal nutrition during this period lowers morbidity and mortality, reduces the risk of chronic disease, and enhances the chances of better development. The study was aimed to assess sick infant and young child feeding practice and associated factors among mothers of children aged less than 24 months old in the Burayu town Oromia, Ethiopia. Methods. Institutional based cross-sectional study design was utilized. The study was conducted from April-May, 2015 among 362 mother-child pair attending the maternal and childcare (MCH) units of the two public health facilities in the Burayu town. Bivariate and multivariable analysis was done to test the relationship between the explanatory and outcome variables and the odds ratio with 95% confidence interval and the -value was used to ascertain statistical significance. Result. More than half (53.6%) of all mothers fed their child more frequently at the time of illness than at a time of health. The mean age of respondents was 25.41 ± 3.56 and ranged from 15-30 years. Nearly three out of five (60.8%) of the respondents attended no formal education. A mother who had got counseling on sick child feeding were nearly three times more likely to feed their child appropriately than their counterparts (AOR: 2.95; 95% CI; 1.78, 4.91). Mothers who were housewives were 55% times less likely to feed their sick child appropriately than those who were working (AOR: 0.45; 95% CI; 0.26, 0.79). Those mothers who have a child aged less than 6 months were 88% less likely to practice appropriate sick child feeding than those who have a child aged more than 6 months (AOR: 0.22;

95% CI; 0.12,0.40). *Conclusion*. Respondents who do not receive counseling on infant and young child feeding have poor sick child feeding practice. Working mother had owned better practices of feeding child particularly at the time of illness. Infants below the age of 6 months deserve more concern in providing frequent breastfeeds at the time of illness.

Tsegaye, H., Desalegne, B., Wassihun, B., Bante, A., & Debalkie, M. (2019).

Prevalence and associated factors of caesarean section in Addis Ababa hospitals, Ethiopia. *Publication: The Pan African Medical Journal*, 34, (136).

Abstract

Introduction: caesarean section refers to the operation of delivering a baby through incisions made in the mother's abdominal wall and uterus. A caesarean section is medically indicated when a significant risk of adverse outcome for mother or baby is present. The objective of this study was to assess the prevalence and associated factors of caesarean section in Addis Ababa Hospitals, Ethiopia.

Methods: institutional based cross-sectional study design was employed on 298 women from between April and May 2017. Study subjects were selected using systematic random sampling by considering the number of delivery. A structured questionnaire was used to collect the data. The data were coded and entered into Epi data version 3.1 and the analysis was carried out in a statistical package for social science versions 22. Descriptive statistics for each variable and binary logistic regression analysis with 95% CI was carried out.

Results: a total of 298 mothers were participated in the study with a response rate of 100%. The overall prevalence of caesarean section in this study was 38.3%. The multivariable analysis indicated that mother who had collage and above [AOR = 3.46 (95%CI; 1.2, 10.76)], giving birth in private health facility [AOR = 1.48 (95%CI; 1.84, 2.59)], and having risk factors [AOR = 2.86 (95%CI; 1.96, 3.42)], were some of the factors associated with caesarean section.

Conclusion: the finding of this study showed that the prevalence of caesarean section was higher in women who gave birth in private health facility, mothers having risk factors, and mothers having educational status of diploma and above. Therefore, identifying risky group during antenatal care follow-up and restraining numbers of caesarean section in private health facilities is essential steps to reduce high prevalence of caesarean section.

Wondawek, T. M., & Ali, M. M. (2019). Delay in treatment seeking and associated factors among suspected pulmonary tuberculosis patients in public health facilities of Adama town, eastern Ethiopia. *BMC Public Health*, *19*(1), 1527.

Abstract

Background

In low-income countries, delays in treatment seeking among tuberculosis patients contribute to easy transmission and high prevalence of tuberculosis.

Objective

The aim of this study was to determine the magnitude of delays in treatment-seeking and risk factors among pulmonary tuberculosis suspected patients in health facilities located in Adama, Ethiopia.

Method

A health-facility based cross-sectional study was conducted at Adama from December 20, 2015, to March 1, 2016, among 598 tuberculosis suspected patients. Data was collected from all study participants on the same day of tuberculosis diagnosis using a structured questionnaire. Epi-Info 3.5.3 and Statistical package for the social sciences (SPSS) version 16.0 were used for data entry and analysis respectively. A bivariate and multivariable regression model was used to investigate the association between delay in seeking-treatment and various factors. Odds ratio with 95% CI and *P*-value < 0.05 were considered as cut off point to measure the strength and significance of the association.

Results

Among 598 pulmonary tuberculosis suspected patients, 79 (13.2%) were smear-positive. Among smear-positive participants, 61(77.2%) delayed seeking treatment and 275 (46%) patients delayed seeking treatment for > 30 days. The following factors were significantly associated with a delay in seeking treatment: female sex OR = 1.57, 95% CI (1.14, 2.18), low monthly income OR = 1.45, 95% CI (1.05, 2.01), lack of knowledge regarding tuberculosis OR = 1.67, 95% CI (1.13, 2.48), and cure rate of tuberculosis OR = 1.836, 95% CI (1.25, 2.69). Conclusion

Nearly half of pulmonary tuberculosis suspected patients delayed seeking treatment in our study area. Female sex, low income, family size of five and greater, no knowledge about tuberculosis and cure rate were factors contributing to delay in treatment-seeking among suspected tuberculosis patients.

Fikrie, A., Alemayehu, A., & Gebremedhin, S. (2019). Treatment outcomes and factors affecting time-to-recovery from severe acute malnutrition in 6–59 months old children admitted to a stabilization center in Southern Ethiopia: A retrospective cohort study. *Italian Journal of Pediatrics*, 45(1), 46.

Abstract

Background

Despite improving access to Severe Acute Malnutrition (SAM) management, information on the quality of the service, as measured by timely recovery, is scare. This study is designed to assess treatment outcomes and factors affecting time-to-recovery from SAM in children 6–59 months admitted to a stabilizing center in Hawassa University Comprehensive Specialized Hospital (HU-CSH), Southern Ethiopia.

Methods

Institutional-based retrospective cohort study was conducted on 420 randomly selected children aged 6–59 months. The children were managed at the hospital from July, 2015 to June, 2017. Pretested structured questionnaire was used to extract data from medical records. Data were analyzed using Kaplan Meir (KM) curve, Log rank test and Cox-Proportional hazards model. The outputs of the bivariable and multivariable Cox model are presented using Adjusted Hazard Ratio (AHR) with the respective 95% Confidence Intervals (CIs).

Results

After a maximum of 59 days treatment 69.3% of the children recovered and 10.8% died. The mean (\pm SD) weight gain rates was 12.7 (\pm 8.9) g/kg/days. The overall incidence density rate of recovery was 3.8 per 100 person-days. The overall median (IQR) time of recovery was 17(10, 24) days. F-100 intake (AHR = 0.502, 95%, CI: 0.29–0.86), Tuberculosis infection (AHR = 1.38, 95% CI: 1.00–1.91) and provision of special medication (IV fluid, IV antibiotic and blood transfusion) (AHR = 0.72, 95% CI: 0.52–0.99) at admission were found to be significant predictors of time-to-recovery from SAM.

Conclusion

The overall recovery from complicated SAM children admitted at HU-CSH after a maximum of 59 days treatment was low (69.4%) and a very high proportion of children (10.8%) end up in death. Therefore, HU-CSH should give special focus for those children present with medical comorbidities during admission.

Wondiye, K., Asseffa, N. A., Gemebo, T. D., & Astawesegn, F. H. (2019). Predictors of undernutrition among the elderly in Sodo zuriya district Wolaita zone, Ethiopia. *BMC Nutrition*, 5(1), 50.

Abstract

Background

In any society, the elderly are among the vulnerable and high risk groups with regard to health status. In persons over the age of 60 years, nutrition is among the important determinants of health. However, undernutrition among the elderly is often under diagnosed and/or neglected. Hence, in this study, we looked at prevalence and factors associated with undernutrition among the elderly. Methods

A community based cross-sectional study was conducted at Sodo Zuriya district. Multi-stage systematic sampling method was used to select 578 elderly. A structured questionnaire was used to collect data on socio-demographics, dietary diversity, and health status of the elderly.

Measurements of weight and height were taken using digital weighing scale and stadio-meter, respectively. Data was entered and cleaned in Epi-Data version3.1and exported to SPSS version 20 for analysis. Binary and multivariate logistic regressions were done and odds ratios with 95% confidence intervals were calculated.

Results

The overall prevalence of undernutrition was 17.1%. On multivariate logistic regression, being unable to read and write (AOR = 2.09), not being married (AOR = 2.02), history of decline in food intake (AOR = 2.1), smoking (AOR = 4.9) and monthly income <\$20 (AOR = 7.5) were factors positively associated with undernutrition.

Conclusion

The study revealed that prevalence of undernutrition in the district was relatively high. Hence, it is among the major public health burdens in the district. Hence, to improve nutritional status of elderly the district health office and health professionals should consider behavioral support interventions to assist in cessation of smoking. There is also a need to financially empower the elderly in the district.

Assefa, A. A., Astawesegn, F. H., & Eshetu, B. (2019). Cervical cancer screening service utilization and associated factors among HIV positive women attending adult ART clinic in public health facilities, Hawassa town, Ethiopia: A cross-sectional study. *BMC Health Services Research*, 19(1), 847.

Abstract

Background

In Ethiopia, cervical cancer is a public health concern, as it is the second most cause of cancer deaths among reproductive age women and it affects the country's most vulnerable groups like; rural, poor, and HIV-positive women. Despite the strong evidence that cervical cancer screening results in decreased mortality from this disease, its utilization remains low.

Methods

An institution-based cross-sectional study was conducted from March 2 to April 1/2019 to assess the level and factors affecting utilization of cervical cancer screening among HIV positive women in Hawassa town. Quantitative data collection methods were used. Data were gathered using a structured and pretested questionnaire. Epi-Info version 7 and SPSS version 23 were used for data entry and analysis respectively. Statistically significant association of variables was determined based on Adjusted Odds ratio with its 95% confidence interval and *p*-value of \leq 0.05. Results

Of the 342 women interviewed, 40.1% (95% CI: 35.00, 45.33%) of them were screened. Having a post primary education (AOR = 5.1, 95% CI: 1.8, 14.5), less than 500 cell/mm3 CD4 count (AOR = 2.7, 95% CI: 1.2, 5.9); duration since HIV diagnosis (AOR = 4.2, 95% CI: 2.1, 8.5), partner support (AOR = 4.7, 95% CI: 2.3, 9.4), having knowledge about risk factors (AOR = 2.9 (95% CI: 1.2, 6.9) and having favorable attitude towards cervical cancer and its screening (AOR = 3.7 (95% CI: 1.8, 7.5) were associated with cervical cancer screening utilization.

Conclusions

The study revealed utilization of cervical cancer screening service was low among HIV positive women. Educational status, duration of HIV diagnosis, partner support, knowledge status about risk factor, CD4 count and attitude towards cervical cancer and its screening were associated with

cervical cancer screening utilization. Health care workers need to provide intensive counseling services for all ART care attendants to increase utilization.

Melese, B., Paulos, W., Astawesegn, F. H., & Gelgelu, T. B. (2019). Prevalence of diarrheal diseases and associated factors among under-five children in Dale District, Sidama zone, Southern Ethiopia: A cross-sectional study. *BMC Public Health*, *19*(1), 1235.

Abstract

Background

Globally childhood diarrhoeal diseases continue to be the second leading cause of death, while in Ethiopia it kills half-million under-five children each year. Sanitation, unsafe water and personal hygiene are responsible for 90% of the occurrence. Thus, this study aimed to assess the prevalence and associated factors of diarrheal diseases among under-five children in Dale District, Sidama Zone, Southern Ethiopia.

Methods

A community-based cross-sectional study was conducted. A face to face interview using a structured questionnaire and observation checklist was used. A total of 546 households with at least one under-five children were selected using simple random sampling techniques. The data entry and cleaning were performed using Epidemiological information software (EPI Info) 3.5.1 and then exported to Statistical Package for Social Science (SPSS) version 16.0 for analysis. Frequencies and proportions were computed as descriptive analysis. Initially using bivariate analysis a crude association between the independent and dependent variables was investigated. Then, those variables with *p*-value ≤ 0.25 were included in multivariable analysis to determine the predictor variables for the outcome variables. Finally, further analyses were carried out using multivariable analysis at a significance level of p-value ≤ 0.05 .

Results

A total of 537 children under the age of 5 years were included. The 2 weeks prevalence of diarrhea among children under the age of 5 years was 13.6, 95% CI (10.7, 16.5%). Educational level [AOR: 3.97, 95% CI (1.60, 8.916)], age of indexed child [AOR: 12.18, 95% CI (1.78, 83.30)], nutritional status [AOR: 6.41, 95% CI (2.47, 16.77.)], hand washing method [AOR, 3.10, 95% CI (1.10, 8.67)], hand washing after latrine [AOR: 2.73, 95% CI (1.05, 6.56)], refuse disposal method [AOR, 3.23, 95% CI (1.37, 7.60)] and housing floor material [AOR: 3.22, 95% CI (1.16, 8.91] were significantly associated with the occurrence of childhood diarrheal diseases.

Conclusion

Childhood diarrhea remains the commonest health problem in the study area. The findings have important policy implications for childhood diarrhoeal disease intervention programs. Thus, activities focusing on proper handwashing techniques at all appropriate times, proper refuse disposal, improving nutrition and better childcare also highly recommended.

Siraj Hussen

Tadele, A., Hussen, S., & Shimelis, T. (2019). Prevalence and associated factors of Chlamydia trachomatis and Neisseria gonorrhoeae among female commercial sex workers in Hawassa City, Southern Ethiopia. *BMC Infectious Diseases*, *19*(1), 61.

Abstract

Background

Chlamydia trachomatis and *Neisseria gonorrhoeae* are the most common pathogens causing genital tract infections. Female commercial sex workers (FCSWs) are the key population to be affected by sexually transmitted infections (STIs). In Ethiopia, little is known about *C. trachomatis* and *N. gonorrhoeae* infections in most at risk population. Therefore, this study aimed to assess the prevalence of these bacterial STIs among FCSWs.

Methods

A cross-sectional study was conducted at the confidential clinic in Hawassa City, Southern Ethiopia from January to April, 2017. A total of 338 FCSWs were selected using systematic random sampling technique and enrolled in the study. Information about socio-demography and associated factors was collected using structured questionnaires. Endocervical swab samples were also collected from the study participants and tested for *C. trachomatis* using rapid immunochromatography assay. Samples were also cultured to isolate *N. gonorrhoeae* according to the standard bacteriological method.

Results

The prevalence of *N. gonorrhoeae* and *C. trachomatis* among FCSWs was 3.3% [95% confidence interval (CI): 1.5-5.3] and 6.8% (95% CI: 3.9-9.5), respectively. FCSWs who consistently practiced sex without condom in the last 6 months had 6.3 times (AOR 6.3; 95% CI 1.61– 24.86, *P* = 0.008), and 4.0 times (AOR 4.0; 95% CI 1.06–15.31, *p* = 0.040) higher odds of acquiring *N. gonorrhoeae* and *C. trachomatis* infections, respectively.

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Conclusion

The observed rates of *C. trachomatis* and *N. gonorrhoeae* infections among FCSWs warrant the need to strengthen intervention efforts. In this regard, screening FCSWs for the specified infections and improving the practice of condom use would be important.

Hussen, S., & Tadesse, B. T. (2019). Prevalence of Syphilis among Pregnant Women in Sub-Saharan Africa: A Systematic Review and Meta-Analysis. *BioMed Research International*, 2019.

Abstract

Objective. Syphilis is one of the most imperative STIs, caused by the spirochete Treponema *pallidum.* During pregnancy it is associated with disastrous health outcomes in the newborn. In sub-Saharan Africa, study findings on the prevalence of syphilis among pregnant women are highly dispersed and inconsistent. The aim of the current review is to conduct a systematic review and meta-analysis of syphilis in sub-Saharan Africa among pregnant women. Design. Systematic review and meta-analysis. Data Sources. Databases including MEDLINE, PubMed, Cochrane Library, Google Scholar, and HINARI and reference lists of previous prevalence studies were systematically searched for relevant literature from January 1999 to November 2018. Results were presented in forest plot, tables, and figures. Random-effects model was used for the meta-analysis. For the purpose of this review, a case of syphilis was defined as positive treponemal or nontreponemal tests among pregnant women. Data Extraction. Our search gave a total of 262 citations from all searched databases. Of these, 44 studies fulfilling the inclusion criteria and comprising 175,546 subjects were finally included. Results. The pooled prevalence of syphilis among pregnant women in sub-Saharan Africa was 2.9% (95%CI: 2.4%-3.4%). East and Southern African regions had a higher syphilis prevalence among pregnant women (3.2%, 95% CI: 2.3%-4.2% and 3.6%, 95%CI: 2.0%-5.1%, respectively) than the sub-Saharan African pooled prevalence. The prevalence of syphilis among pregnant women in most parts of the region seemed to have decreased over the past 20 years except for the East African region. However, prevalence did not significantly differ by region and time period. *Conclusion*. This review showed a high prevalence of syphilis in sub-Saharan Africa among pregnant women. The evidence suggests strengthening the screening program during pregnancy as part of the care package during antenatal care visits. Programs focusing on primary prevention of syphilis in women should also be strengthened.

Tesfaye, D. J., Hibistu, D. T., Abebo, T. A., Asfaw, F. T., Lukas, K., Laelago, T., Turuse, E. A., Kebede, H. G., Altaye, A. A., & Bekele, F. B. (2019). Option B plus antiretroviral therapy adherence and associated factors among HIV positive pregnant women in Southern Ethiopia. *BMC Pregnancy and Childbirth*, *19*(1), 82.

Abstract

Background

Adherence to Option B plus Antiretroviral Therapy plays a vital role in preventing mother to child transmission of Human Immunodeficiency Virus and development of drug resistance. This study was aimed to assess adherence to option B plus ART and associated factors among HIV positive pregnant women at public Hospitals in Southern Ethiopia.

Methods

Facility based cross sectional study was conducted on HIV positive pregnant mothers attending public health facilities' antenatal care unit. Systematic random sampling technique was employed to select 290 HIV positive pregnant women enrolled in the Option B plus program. Data were collected by using structured questionnaire. Bivariate and multivariable logistic regression analysis were used to identify factors associated with option B plus ART adherence. *P*-value less than 0.05 was considered as cut of point to declare statistical significance.

Results

The overall adherence to option B plus ART among HIV positive pregnant women was 236 (81.4%). Three in twenty, (14.8%) participants were none adherent to Option B plus ART due to difficulty in adopting time schedule and forgetting to take medication. During first trimester of pregnancy, 16 (5.5%) were stopped taking ART medication due to side effects. Pregnant women who started ART at the time of HIV diagnosis [AOR = 1.99, 95% CI: (1.02, 3.95)], and who had five or more antenatal care visits [AOR = 4.10, 95% CI (1.65, 10.02)] were more likely to adhere to option B plus ART. Women who should travel 30–60 min on foot to access ART from service delivering facilities were less likely to adhere to option B plus [AOR = 0.39, 95% C I: (0.17, 0.88)]. Conclusions

The overall adherence to option B plus ART was suboptimal. Measures that improve recalling ability of individuals to take ART on time, and minimize ART side effects during first trimester of pregnancy need to be given emphasis. The study finding indicates the need for reconsidering

the ad-hoc focused antenatal care visit at policy and program level by increasing the number of follow up visit with proper counseling on ART adherence benefits, and improving service accessibility.

College of Agriculture

Ayenew, A., Tolera, A., Nurfeta, A., & Assefa, G. (2019). Supplementary Value of Camel's Foot Tree (Piliostigma thonningii) Leaf Meal as a Replacement for Concentrate Mixture on the Performance of Gumuz Sheep Fed Finger Millet Straw Based Diet. *East African Journal of Veterinary and Animal Sciences*, 3(1), 1–8.

Abstract

The objective of the experiment was to evaluate the effects of substitution of Camel's foot tree (Piliostigma thonningii (PT)) leaf meal for concentrate mix (CM) on the performances of Gumuz sheep. During the 90 days feeding trial, thirty-five yearling male Gumuz sheep with an average initial body weight of 20.21 ± 2.82 kg (mean \pm SD) were grouped into seven blocks of five animals, and each animal was randomly assigned to one of the five dietary treatment feeds within a block. The dietary treatments included feeding of ad libitum finger millet straw supplemented with 100% CM (T1); 75% CM + 25% PT (T2); 50% CM + 50% PT (T3), 25% CM + 75% PT (T4) and 100% PT (T5) on dry matter (DM) basis. The supplements were offered at the rate of 300 g DM/day. The total DM and organic matter intakes for T1 were greater (P<0.05) than those sheep fed T4 and T5 diets while T2 and T3 had an intermediate value. The lowest (P<0.05) supplement and CP intakes were recorded for T5. The digestibility of DM, organic matter, crud protein, neutral detergent fiber and acid detergent fiber was similar (P>0.05) up to 50% PT leaf meal substitution level. Sheep fed T5 diet had the lowest (P < 0.05) DM and nutrient digestibility. The average daily gain for T1, T2, T3 and T4 was higher (P<0.05) than those consuming T5 diets. The slaughter weight for T1 was higher (P<0.05) than T5 while T2, T3 and T4 had an intermediate value. The hot carcass weight and empty body weight were similar (P > 0.05) among treatments. An increase in proportion of PT leaf meal beyond 75% resulted in BW loss of 19.2 g/d. It was concluded that PT leaves could serve as alternative CP supplement in crop residue-based feeding and substitution of concentrate with (2019) Volume 3 (1): PT leaf meal beyond 50% had no beneficial role in sheep feeding.

Local Burden of Disease Educational Attainment Collaborators. (2020). Mapping disparities in education across low-and middle-income countries. *Nature*, *577*(7789), 235.

Abstract

Educational attainment is an important social determinant of maternal, newborn, and child health. As a tool for promoting gender equity, it has gained increasing traction in popular media, international aid strategies, and global agenda-setting. The global health agenda is increasingly focused on evidence of precision public health, which illustrates the subnational distribution of disease and illness; however, an agenda focused on future equity must integrate comparable evidence on the distribution of social determinants of health. Here we expand on the available precision SDG evidence by estimating the subnational distribution of educational attainment, including the proportions of individuals who have completed key levels of schooling, across all low- and middle-income countries from 2000 to 2017. Previous analyses have focused on geographical disparities in average attainment across Africa or for specific countries, but—to our knowledge—no analysis has examined the subnational proportions of individuals who completed specific levels of education across all low- and middle-income countries. By geolocating subnational data for more than 184 million person-years across 528 data sources, we precisely identify inequalities across geography as well as within populations.

Subject terms: Risk factors, Developing world, Education, Society

Debebe, S., Abebe, A., & Eik, L. (2019). The Effect of Partial Substitution of Maize with Furfurame on the Production Performance and Carcass Characteristics of Broilers. 19(1), 56–72.

Abstract

The objective of this study was to evaluate the effect of substituting maize with furfurame, a byproduct of Kocho (Ensete Ventricosum) processing, in a concentrate mix on feed intake, growth performance, nutrient retention and carcass parameters of Hubbard Chickens. Four treatment diets namely T1, T2, T3, and T4 were formulated containing 0%, 33%, 66% and 100% of furfurame as a substitute for maize, respectively, in concentrate mixture. After 3 weeks of brooding, 120 unsexed chicks were weighed and randomly allocated to the four dietary treatments with three replicates of 10 chicks per treatment in completely randomized design. The experiment lasted for 56 days. At the end of the experiment, a cockerel and a pullet were randomly selected from each

replicate, and slaughtered to assess nutrient retention and carcass traits. The daily dry matter intake of the chicks fed on T3 and T4 diets were higher (p<0.05) than those reared on T1 and T2 diets. The average daily wights gain of chicks fed T1 diet were higher (p<0.05) than chicks fed T3 and T4 diets. Chicks receiving T1 diet had better (p<0.05) feed conversion efficiency while those receiving T4 were the least (p<0.05) efficient. Crude protein retention was the highest (p<0.05) for T1 diet while chicks in T4 retained the least. Chicks fed on T1 diet had the highest (p<0.05) metabolizable energy retention compared to other treatment diets. Chicks fed on T1 diet had higher (p<0.05) slaughter weight, commercial carcass weight and edible offal weight compared to those fed on T4 diet. The dressing percentage of the chickens did not vary across the treatments. Based on intake of nutrients and dressing percentage, it is concluded that furfurame can be used as energy source feedstuff in poultry ration replacing maize up to 33% for stallholder farmers in enset growing area.

Keywords: Broiler; Carcass traits; Ensete ventriocosum; Furfurame, Growth nutrients retation

Negewo, T., Melaku, S., Asmare, B., & Tolera, A. (2019). Effect of graded levels of concentrate supplementation on carcass yield and characteristics of local sheep fed urea treated maize cob as a basal diet. *Scientific Papers Animal Science and Biotechnologies*, *52*(1), 27–37.

Abstract

The experiment was conducted with the objective of investigating the effect of graded levels of wheat bran (WB) and noug seed cake (NSC) mixtures on carcass yield and characteristics of local Arsi-Bale sheep fed urea treated maize cob (UTMC). The experiment consisted of digestibility and ninety days of feeding trials followed by evaluation of carcass components at the end of these trials. The experimental sheep were vaccinated against common infectious diseases of sheep, dewormed and disinfected against internal and external parasites, respectively. The experimental design was randomized complete block design. The treatments were *ad libitum* feeding of UTMC (T1) and supplementation with mixtures of WB and NSC at a ratio of 2WB:1NSC offered at 150 g (T2), 250 g (T3) and 350 g DM/head /day (T4). Water and salt were offered free choice and UTMC was given *ad libitum* throughout the experimental period. The result indicated that dressing percentage on slaughter weight (SWT) and hot carcass weight (HCW) basis was higher (P<0.001)

for supplemented sheep than the control. Similarly, rib eye muscle area was higher (P<0.001) in supplemented sheep than the control group. Generally, T4 improved carcass yield as well as characteristics and could be used as an alternative feed supplement in UTMC based feeding of Arsi-Bale sheep.

Keywords: Dressing percentage, Edible offal, Local sheep, Maize cob, Urea treatment

Kebede, T., Betseha, S., & Melesse, A. (n.d.). Assessment of Morphological, Egg Quality and Carcass Characteristics of Local and Exotic Chickens Reared in Two Districts of Metekel Zone Ethiopia.

Abstract

A study was conducted in two selected districts 9Pawe and Bulen) of Metekel Zone to assess the morphological and egg quality traits and carcass components of local and exotic chickens. Morphometric traits were assessed from 900 adult local and exotic chickens while qualitative traits were determined from 600 local chickens. For the evaluation of egg quality, 600 eggs from both genotypes (300 eggs from exotic and 300 from local) were used from sampled households. A total of 80 chickens (40 from each genotype were used to assess the carcass components. The results indicated that the majority of local chickens raised in the two districts are characterized by normal feather type. The local chickens from Pawe were characterized by pea comb while those of Bulle by the rose comb. Creamy ear lobe and yellow shank colors were predominant in both districts. Except for back length and shank length, chickens in Bulen were superior (p < 0.05) to those of Pawe in all other morphometric traits. Male chickens had higher (p<0.05) values in all morphometric traits than females. Except for body length and back length, other morphometric traits were higher (p < 0.05) in exotic chickens than in locals. Except egg yolk colors, egg quality values were higher for Bulen (p<0.05) chickens than those of Pawe. Eggs of exotic chickens had higher (p < 0.05) qualities than those of local chickens. Most of the carcass components were higher (p<0.05) in Bluen chickens than those Pawe. Exotic genotypes were superior (p<0.05) to local chickens in most carcass components. Male chickens had higher (p < 0.05) carcass values than females. In conclusion, exotic chickens were found to be superior to local chickens in most of the studied quantitative traits and thus could be further used by the smallholder farmers. The survival

ability and egg production potential of exotic chickens under smallholder settings appears to be relevant research gaps to be addressed by other scholars.

Keywords: Carcass, Egg quality, Exotic chicken, Local chicken, Metekel zone, Morphological traits.

Melesse, A., Ganebo, G., & Abebe, A. (2019). Substitution Effect of Noug Seed (Guzoitia abyssinica) Cake with Various Levels of Samma (Urtica simensis) Leaf Meal on Egg Production and Egg Quality Parameters of Commercial Layer Hens. *Iranian Journal of Applied Animal Science*, 9(4), 727–735.

Abstract

The substitution effect of noug (Guzoitia abyssinica) seed cake with samma (Urtica simensis) leaf meal (SLM) was investigated on egg production and egg quality parameters in commercial layer hens. Five treatment (T) diets were formulated to contain SLM at 0% (T1), 3% (T2), 6% (T3), 9% (T4) and 12% (T5) by substituting noug seed cake. One-hundred fifty Isa Brown layer pullets were randomly allocated to the treatment diets, replicated thrice consisting of 10 hens each. The results indicated that feed intake did not vary among treatment diets. The individual final body weight (g) of hens in T1, T2, T3, T4 and T5 was 1786, 1804, 1804, 1819, 1858, respectively, being the highest (P<0.05) for T5. The average egg weight (g) of hens fed with T1, T2, T3, T4 and T5 diets was 45.0, 47.2, 48.9, 53.5 and 55.5, respectively, being (P<0.05) different for T4 and T5. The henhoused egg production (%) for hens fed with T1, T2, T3, T4 and T5 diets was 44.3, 49.5, 59.4, 70.9 and 80.5%, respectively and differed (P<0.05) from each other. The respective individual daily egg mass output (g) in hens fed with T1, T2, T3, T4 and T5 diets was 20.0, 23.4, 29.1, 37.9, and 44.7, being (P<0.05) different from each other. The feed conversation ratio (kg feed/kg egg mass) was 5.20, 4.18, 3.55, 2.83 and 2.40 for hens reared in T1, T2, T3, T4 and T5, respectively and being lowest (P<0.05) for those of T4 and T5. Hens fed with T3, T4 and T5 diets had higher (P<0.05) shell thickness than those of T1 and T2. The yolk index was higher (P<0.05) for hens reared in T5 than those of T1 and T3 diets. In conclusion, the substitution of noug seed cake with SLM improved the egg production and most egg quality parameters. We recommend further studies to corroborate the effect of samma leaf on total cholesterol and triglycerides concentrations of egg yolk and meat.

Dolebo, A. T., Khayatzadeh, N., Melesse, A., Wragg, D., Rekik, M., Haile, A., Rischkowsky, B., Rothschild, M. F., & Mwacharo, J. M. (2019). Genome-wide scans identify known and novel regions associated with prolificacy and reproduction traits in a sub-Saharan African indigenous sheep (Ovis aries). *Mammalian Genome*, *30*(11–12), 339–352.

Abstract

Maximizing the number of offspring born per female is a key functionality trait in commercialand/or subsistence-oriented livestock enterprises. Although the number of offspring born is closely associated with female fertility and reproductive success, the genetic control of these traits remains poorly understood in sub-Saharan Africa livestock. Using selection signature analysis performed on Ovine HD BeadChip data from the prolific Bonga sheep in Ethiopia, 41 candidate regions under selection were identified. The analysis revealed one strong selection signature on a candidate region on chromosome X spanning BMP15, suggesting this to be the primary candidate prolificacy gene in the breed. The analysis also identified several candidate regions spanning genes not reported before in prolific sheep but underlying fertility and reproduction in other species. The genes associated with female reproduction traits included SPOCK1 (age at first oestrus), GPR173 (mediator of ovarian cyclicity), HB-EGF (signalling early pregnancy success) and SMARCAL1 and HMGN3a (regulate gene expression during embryogenesis). The genes involved in male reproduction were FOXJ1 (sperm function and successful fertilization) and NME5 (spermatogenesis). We also observed genes such as PKD2L2, MAGED1 and KDM3B, which have been associated with diverse fertility traits in both sexes of other species. The results confirm the complexity of the genetic mechanisms underlying reproduction while suggesting that prolificacy in the Bonga sheep, and possibly African indigenous sheep is partly under the control of *BMP15* while other genes that enhance male and female fertility are essential for reproductive fitness.

Bosha, T., Lambert, C., Riedel, S., Gola, U., Melesse, A., & Biesalski, H. K. (2019). Validation of the CIMI-Ethiopia Program and Seasonal Variation in Maternal Nutrient Intake in Enset (False Banana) Growing Areas of Southern Ethiopia. *International Journal of Environmental Research and Public Health*, *16*(16), 2852.

Abstract

Background: Tools for the rapid and accurate analysis of nutrient intakes from diets of individuals in Southern Ethiopia are lacking. The Calculator of Inadequate Micronutrient Intake program for Ethiopia (CIMI-Ethiopia) has been developed to overcome this problem. CIMI-Ethiopia also computes protein and energy intakes from the diet. The objectives of the current study were to validate CIMI-Ethiopia for the dietary pattern of Southern Ethiopia, and assess the nutrient intakes in postharvest dry and lean wet seasons. Methods: 24-h dietary recall (24HR) data was collected from 578 women of a reproductive age in postharvest dry and lean wet seasons in 2017. For analysis, 24HR data was entered into NutriSurvey (NS), which was the reference nutrition software, and then into CIMI-Ethiopia. For validation, the mean and standard deviation (SD) of the difference between CIMI-Ethiopia and NS were computed. The percentage of participants with an inadequate intake was calculated. The correlation between CIMI-Ethiopia and NS results was determined. The nutrient intakes in postharvest dry and lean seasons were compared. Results: Among the nutrients, pantothenic acid, vitamin B1, and protein showed a very high accuracy in CIMI-Ethiopia calculation (difference (D) < 5.0% of the NS result). Nutrients with a good accuracy (|D| = 5% - 15%) were iron, zinc, magnesium, vitamin B12, vitamin B6, and energy. The accuracy for calcium, niacin, and vitamin A was moderate (|D| = 15% - 30%). The intakes calculated by CIMI-Ethiopia and NS of iron, zinc, magnesium, calcium, B-complex vitamins, vitamin A, protein, and energy were highly correlated (r = 0.85-0.97, p < 0.001). NS analysis identified a significant reduction in the mean intake of iron; zinc; magnesium; pantothenic acid; vitamin B1, B12, and D; protein; and energy in the lean wet season; however, calcium and vitamin A intake increased. Conclusions: It has been found that CIMI-Ethiopia is a valid tool for estimating nutrient intakes at an individual level in Southern Ethiopia. The study demonstrated a decline in intakes of iron; zinc; magnesium; pantothenic acid; vitamin B1, B12, and D; protein; and energy in the lean wet season. This result provides some hint for fortification and supplementation programs that aim to combat maternal malnutrition in rural Southern Ethiopia.

Keywords: CIMI-Ethiopia; lean wet season; Micronutrient intake; Postharvest dry season; Reproductive age

Bosha, T., Lambert, C., Riedel, S., Melesse, A., & Biesalski, H. K. (2019). Dietary Diversity and Anthropometric Status of Mother–Child Pairs from Enset (False Banana) Staple Areas: A Panel Evidence from Southern Ethiopia. *International Journal of Environmental Research and Public Health*, *16*(12), 2170.

Abstract

Background: A sizable cross-sectional studies demonstrated a low dietary diversity in Southern Ethiopia. However, its seasonal trend has not been well studied in areas where nutrient-poor enset (false banana (Ensete ventricosum)) foods are major staple. Moreover, there is scarcity of information on seasonal nature of anthropometric status of mother-child pairs (MCP) from the same areas in Southern Ethiopia. Therefore, the present study aimed to investigate the dietary diversity and anthropometric status of MCP in postharvest dry and lean wet seasons and identify factors associated with anthropometric status. Methods: The dietary intake and anthropometric data were collected from 578 households (578 mothers and 578 children) January–June 2017. The study compared data of the two seasons using McNemar's test for dichotomous, Wilcoxon signedrank test for non-normally distributed, and paired samples t-test for normally distributed continuous data. Logistic regression was conducted to identify risk factors for malnutrition. In addition, Spearman's Rho test was used to determine correlations between maternal and child variables. Results: Over 94% of the mothers did not fulfil the minimum diet diversity score in both seasons. The meal frequency and pulses/legumes intake significantly declined in lean wet season; however, dark green leaves consumption increased. Meat, poultry, and fish consumption dropped to almost zero in the lean wet season. The dietary diversity and anthropometric status of the MCP were correlated. Weight-for-age (WAZ) and weight-for-height (WHZ) of children significantly declined in the lean wet season. In the same way, maternal mid upper arm circumference (MUAC), body weight, and body mass index (BMI) dropped (p < 0.001) in this season. Being pregnant and a lactating mother, poverty, and the ability to make decisions independently predicted maternal undernutrition (low MUAC). On the other hand, maternal undernutrition and education were associated with child underweight. Conclusions: The results demonstrated that the dietary diversity of MCP is low in both postharvest dry and lean wet seasons. This suggests the need for continuous nutrition intervention to improve the dietary diversity. In addition, the anthropometric status of MCP declines in lean wet season. This may provide some clue for policy targeting on improving nutritional status of mothers and children in rural Southern Ethiopia.

Keywords: Dietary diversity; Anthropometric status; Enset staple areas; MCP; Postharvest dry Season; Lean wet Season; Southern Ethiopia

Melesse, A., Steingass, H., Schollenberger, M., Holstein, J., & Rodehutscord, M. (2019). Nutrient compositions and in vitro methane production profiles of leaves and whole pods of twelve tropical multipurpose tree species cultivated in Ethiopia. *Agroforestry Systems*, *93*(1), 135–147.

Abstract

A screening study was conducted to investigate the nutrient composition, anti-nutritional factors, in vitro gas (GP) and methane (CH₄) production of leaves and whole pods in tropical multipurpose trees (MPTs). The results indicated that the highest CP (296 g/kg DM) was found in Moringa stenopetala leaves followed by Acacia abysinica (277 g/kg DM), Millettia ferruginea (264 g/kg DM), Prosopis juliflora (261 g/kg DM) and Moringa oleifera (256 g/kg DM). In whole pods, the CP ranged from 172 in *M. ferruginea* to 191 g/kg DM in *M. stenopetala*. The starch in *M.* stenopetala, P. juliflora and Chamaecytisus palmensis leaves was 44.2, 28.8 and 24.4 g/kg DM, respectively. Leaves of Cajanus cajan had the highest concentrations of valine, isoleucine, leucine, phenylalanine, lysine and threonine. The highest concentration of total and tannin phenols were observed in leaves of A. nilotica while P. juliflora leaves had the lowest. Leaves of M. oleifera had higher total phenols and soluble condensed tannins than those of M. stenopetala. The in vitro GP were (P < 0.05) higher in leaves of Moringa species, Sesbania sesban, C. palmensis and Leucaena leucocephala than other MPTs. The CH₄ production in A. nilotica, P. juliflora and C. cajan leaves was 1.05, -1.16 and 1.79 ml/200 mg DM, respectively and were lower (P < 0.05) than other MPTs. The lowest CH₄ was observed in *M. ferruginea* pods (2.64 ml/200 mg DM) being (P < 0.05) different from other species. In conclusion, leaves of A. nilotica, P. juliflora, C. cajan and pods of M. ferruginea were identified as potential candidates in mitigating CH₄ production and might be used as feed additives or supplementary feed for grazing ruminants.

Assefa, H., Melesse, A., & Taye, M. (2019). Characterization of indigenous chicken production system in Sheka zone, south western Ethiopia. *International Journal for Research in Agricultural and Food Science*, 5(2), 1–16.

Abstract

The survey was conducted in Sheka Zone to characterize the production system of indigenous chicken populations. A mixture of purposive and random sampling techniques was used to collect the data. Data on chicken production system were assessed through semi-structured questionnaire survey. Households who rear only indigenous chicken were considered in this study. The findings revealed that the mean flock size in the study area was 13.2 per household. About 38.3 and 61.7% of respondents replaced their flock through buying from market and from hatched, respectively. The primary purpose of egg production in the study zone was for income generation (80.4%). The study indicated that indigenous chicken production system in study area is characterized by scavenging with seasonal feed supplemented system. The most common supplementary feed was Ensete ventricosum (processed enset) (64.9%) in the study zone. About 52.5% of respondents keep their chickens in a separate house while the rest (47.5%) used different types of night sheltering systems. Newcastle disease (40.5%) was the main devastating diseases reported by the households. The mean age at first egg laying for pullets and sexual maturity for cockerels was 6.3 and 5.6 months, respectively. The total number of eggs per clutch and number of clutches per year were 13.6 and 3.0, respectively, resulting in total number of 40.8 eggs per year. About 8.7 eggs were incubated per clutch from which 74.1% of them were hatched with a survival rate was 59.3 %. Therefore, the present study suggests that indigenous chickens are able to produce and reproduce under scavenging system which calls for strategic interventions including selection among local chickens, improving the feeding and housing systems and provision of veterinary services on regular basis.

Key words: Indigenous chicken, Sheka, scavenging system, productivity traits, agroecology

Belete, S., Bezabih, M., Abdulkadir, B., Tolera, A., Mekonnen, K., & Wolde-meskel, E. (2019). Inoculation and phosphorus fertilizer improve food-feed traits of grain legumes in mixed crop-livestock systems of Ethiopia. *Agriculture, Ecosystems & Environment, 279*, 58–64.

Abstract

Grain legumes play an important role as source of food and feed in smallholder mixed systems. They also contribute to soil fertility improvement through biological nitrogen fixation. Although rhizobium inoculation and phosphorus fertilizer are known to improve grain yield of legumes, information is limited on the effect of this practice on the yield and fodder quality of the haulm. This study was conducted to evaluate the effects of rhizobium inoculation (I) and phosphorus fertilizer (P) on yield and nutritional quality of grains and haulms of grain legumes (faba bean, chickpea, common bean and soybean) on farm across diverse agroecological locations in the Ethiopian highlands. The crops were subjected to four treatments [+I, +P, -I+P] and a negative control (-P-I)] at multiple locations on farm during the main cropping season in 2016. Yield data was recorded during grain harvesting, and subsequently representative samples of grains and haulms were collected and analyzed for quality variables. Effects of the treatments were significant (P < 0.05) with 30% increase on grain yield for all studied crops and 28% increase on haulm dry matter yield for faba bean, common bean and soybean. Crude protein (CP) and in vitro organic matter digestibility (IVOMD) values of faba bean, common bean and soybean haulms were higher (P < 0.05); and neutral detergent fiber (NDF) and acid detergent fiber (ADF) contents were lower (P < 0.05) for the treatments than the control. The haulm CP content and IVOMD of chickpea also responded positively (P < 0.05) to the treatments. The current results demonstrated the possibility of improving both yield and quality of grains and haulms of grain legumes with the application of efficient rhizobium inocula and P fertilization. This practice offers an opportunity for smallholders in the crop-livestock system to improve the food-feed traits of grain legumes with minimal input and environmental footprint.

Tirfessa, G., & Tolera, A. (2019). Comparative evaluation of chemical composition, in vitro fermentation and methane production of selected tree forages. *Agroforestry Systems*, 1–10.

Abstract

The objective of this study was to investigate the nutritive value of leaves of six tree forage species [Acacia albida (Del.), Acacia nilotica (L.) Del., Balanites aegyptiaca (L.) Del., Leucaena *leucocephala* (Lam.) de Wit, *Moringa stenopetala* (Baker f.) Cufodontis and *Morus alba* (L.)] sampled from southwestern part of Ethiopian rift valley. The leaf samples were analyzed for chemical composition using official methods, and in vitro gas test was conducted to estimate their metabolizable energy content, organic matter digestibility (OMD), short-chain fatty acid (SCFA), ammonia nitrogen (NH₃-N) and gas production characteristics. Crude protein was highest in L. *leucocephala* (213.09 g kg⁻¹ DM) and *M. stenopetala* (209.80 g kg⁻¹ DM) and the lowest was in *M. alba* (101.63 g kg⁻¹ DM). The fiber (NDF, ADF and ADL) fractions were highest in *B*. aegyptiaca and lowest in M. stenopetala. Condensed tannin concentration ranged from 10.76 g kg⁻¹ DM in *B. aegyptiaca* to 81.89 g kg⁻¹ DM in *A. nilotica*. The OMD, cumulative gas volume, SCFA and NH₃-N production were highest (p < 0.05) in *M. stenopetala* and *M.* alba followed by the values measured for L. leucocephala, B. aegyptiaca and A. albida and lowest was for A. nilotica. Highest methane (CH₄) production per gram of dry matter was noted for M. stenopetala and the lowest for A. nilotica though opposite situation was observed when CH₄ production was expressed as a ratio to total gas produced. Overall, most of the studied browse plants are desirable candidate species for mitigation of enteric methane emission while supplying optimum level of nitrogen if used as a supplement to low-quality forages.

Ayenew, A. (2019). Utilization and Nutritive Value of Piliostigma thonningii as Ruminant Feed in North Western Ethiopia. *Ethiopian Journal of Applied Science and Technology*, *10*(2), 1–10.

Abstract

The objectives of this study were to asses the cultivation and utilization of Piliostigma thonningii (P.thonningii) and to evaluate the chemical composition and in vitro dry matter digestibility (IVDMD) of twigs and leaves of P.thonningii harvested at different phenological stages of the tree in Northwestern Ethiopia. A total of 180 purposively selected households from four districts were interviewed. Leaf and twig samples of P.thonningii were harvested at three different phenological

stages of the tree. Stage one (S1) was the time when P. thonningii leaves were well emerged after complete shedding of the leaves (May); stage two (S2) was the time between leaf emergence and leaf shedding (August); and stage three (S3) was the time when the plant starts shedding its leaves (November). The study showed that 97.8% of the respondents used P.thonningii as a feed resource and to fill the feed deficits during times of feed shortage. Leaves, twigs and pods of P.thonningii were reported as edible parts of the plant by cattle, sheep and goats. Respondents had a positive impression on the feeding value of P.thonningii. The crude protein (CP) content varies from 16.8 to 20 g/kg DM and 10.5 to 18.5 g/kg DM in leaf and twig, respectively. The CP content was higher at early stage of the leaf emergence, while the reverse was true for NDF and ADFcontent, and was higher in the leaf than the twig fraction. The IVDMD was higher (P<0.05) in S1 (554 g/kg DM) than S2 (522 g/kg DM) and S3 (459 g/kg DM). The quality of P.thonningii in the studied communities, therefore, makes it an appropriate choice for its inclusion in agroforestry systems and the tree can contribute to livestock production through provision of feed. Therefore, for efficient utilization of the tree an extension work needs to be strengthened to create awareness in the planting of the tree.

Fekade, N., Urge, M., Nurfeta, A., & Animut, G. (2019). Effects of Replacing Maize with Kocho in White Leghorn Layers Ration on Egg Production, Egg and Chick Quality, Fertility and Hatchability. *East African Journal of Sciences*, *13*(1), 65–74.

Abstract

One hundred and eighty 26-week old white leghorn layers were used to evaluate the effect of replacing maize with kocho on egg production, egg and chick quality as well as fertility and hatchability. The layers were fed with ration containing kocho at the levels of 0% (T1), 33% (T2), 67% (T3) and 100% (T4) replacing white maize grain in the ration. The experiment was arranged in a completely randomized design with four treatments, each replicated three times with 15 birds each. The experiment lasted 12 weeks. Hens were weighed at the start and end of the experiment. Data on dry matter intake, hen day egg production (HDEP), egg weight and egg mass were recorded daily. Egg quality parameters (egg shell weight and thickness, albumen weight and height, Haugh unit and yolk weight as well as color) were determined at the interval of 7 days on 4 eggs per replicate. Kocho contained 3663 kcal/kg DM, 3.8% CP, 2.5% ether extract, 2.3% crude

fiber and 1.5µg/100g beta-carotene. Highly significant (P0.05) among treatments. HDEP for T3 (53.83 %) and T4 (53.62%) was similar and significantly (P < 0.05) higher than T1 (40.54%) and T2 (43.19%). Egg quality characteristics, except yolk color were similar (P > 0.05) among treatments. Yolk color was higher (P < 0.05) for T1 compared with T3 and T4. Percent hatchability on fertile egg bases for T4 was significantly (P< 0.05) higher for T4 compared to the rest of the treatments but T2 and T3 had similar values. The lowest (P < 0.05) late embryonic mortality was recorded for T1. Fertility, early and pipe embryonic mortalities, chick weight, chick length and yield percentage were similar (P > 0.05) among treatments. The partial budget analysis indicated that replacement of maize with 67% (T3) kocho gave a higher net return. Therefore, kocho can replace maize in layers ration when there is scarcity of maize in enset growing areas of Ethiopia.

Keywords: Egg production; Fertility; Hatchability; Kocho, Layers

Kefelegn, K., Asmamaw, Y., Solomon, M., & Ajebu, N. (n.d.). Analysis of Growth Performance Data in Sidama Goats using Fixed and Random Regression Models.

Abstract

Most statistical approaches in experiments of feeding trial are based on the analysis of variance (ANOVA) and least square regressions. However, most of the time, the assumption that data are independent is violated since several measurements are taken on the same subject (repeated measures). In addition, the presence of intra- and interobservers variability can potentially obscure significant differences. In this study, repeated records of body weight gains on goats were analyzed fitting fixed and random regression models. Up to eight 'repeated records' per goat, measured between 10th and 80th day of age post the time of initial body weight recording, were available for analysis. The objectives of this study were to compare the growth curve of animals in different treatments and to evaluate the differences in body weight gains caused by different rations in the treatments and their implications on choosing a ration. Results showed that a linear regression on age modelled changes in variation of body weight gain adequately. A ration with E. brucei leaf was found to provide goat with good body weight gain with a minimum cost of ration.

Keywords: Body weight gain; Covariance structure; Feeding trial; Fixed and random regressions; Goat; Model selection
Gedefa, T., Nurfeta, A., & Tola, N. (n.d.). Evaluation of production performance of Arsi-Holstein Friesian crossbred dairy cattle: A case of Assela Model Agricultural Enterprise, Arsi zone, Oromia Region.

Abstract

The objective of this study was to evaluate the productive performance of Arsi-Holstein-Friesian crossbred dairy cows at Assela Model Agricultural Enterprise (AMAE). A retrospective study was carried out using data recorded from 1996 to 2011 to estimate adjusted lactation milk yield (ALMY, adjusted 305 days), lactation length (LL), birth weight (BW) and weaning weight (WWT). Fixed factors considered were year (16), season (3), parity (6) and blood level (4). The overall least square means of ALMY, BW, WWT, LL, were 2155 kg, 34 kg, 71 kg, and 314 days, respectively. Season had no significant effect on ALMY and LL. Year of calving had significant (p<0.05) effect on ALMY. Year of calving showed significant influences (p<0.01) on LL. There was no significant difference among blood levels in ALMY and LL. Lower (p<0.05) ALMY was recorded for parity 6th+ than that of 2nd and 3rd, while the other parities were intermediate. There was no significant (p<0.05) difference among parities in LL. Sex and blood levels showed significant (p<0.05) effect on BW and WWT. The BW for males was higher (p<0.05) than that of females, whereas, the WWT for female was higher (p<0.05) than that of male. Year had an important role in determining the performance of dairy cows indicating there was variation in feed availability and quality as well as variation in management through the years. Therefore, stabilized environment, setting breeding program, and benchmarking parity number is important to improve productive performance of the farm.

Key words: Arsi, crossbred, Holstein-friesian productive

Berhanu, Y., Olav, L., Nurfeta, A., Angassa, A., & Aune, J. B. (2019). Methane emissions from ruminant livestock in Ethiopia: Promising forage species to reduce CH4 emissions. *Agriculture*, *9*(6), 130.

Abstract

This paper assesses the ability of fodder plants to reduce methane (CH₄) emissions while simultaneously improving animal productivity in Ethiopia. Enteric CH₄ emissions from ruminants in Ethiopia increased by 12% or \approx 6197 Gg CO₂-eq. in 2017 compared to the year 2011. In this study, six tropical multipurpose forages (Leucaena leucocephala (Lam.) de Wit, Moringa stenopetala (Bak.f.) Cuf., Sesbania sesban (L.) Merr., Cajanus cajan (L.) Millsp., Crotalaria juncea L., and Lablab purpureus L.(Sweet)) and maize stover were characterized in terms of chemical composition, in vitro CH₄ production, and CH₄ concentration (%). The objective was to identify forages with low CH₄ production potential but with adequate forage quality. The forages differed significantly in chemical composition and in enteric CH₄ emission. The dry matter (DM), ash, crude protein (CP), neutral detergent fibre (NDF), acid detergent fibre (ADF), and acid detergent lignin (ADL) ranged between 89.4-95.4%, 6.08-12.5%, 3.3-30.7%, 20.4-76.0%, 10.8-44.8, and 2.9-14.1%, respectively. All forage plants, except maize stover, contained high CP content above a threshold value (i.e., 7%). Cajanus c. generates the lowest amount of CH₄ (32.83 mL/0.2 g DM incubated). CH₄ concentration (%) was used as a potential indicator to determine the capacity of a plant to lower CH₄ production. Among the studied species, *L. purpureus* showed the highest CH₄ reduction potential (16%) followed by *C*. *juncea* (23.45%), *M*. stenopetala (24.2%), and L. leucocephala (25.5%). M. stenopetala was the most frequently preferred by the farmers followed by C. juncea and L. leucocephala. We concluded that M. stenopetala, C. juncea, and L. leucocephala can be promoted as valuable feed resources for ruminants while simultaneously reducing CH₄ emissions.

Keywords: Ruminant livestock; methane Emissions; Methane reduction; Promising forages; Farmers' preferences; Ethiopia

Abera, A., Abera, G., & Beyene, S. (2019). Effect of Blended Fertilizers on Potato (Solanum tubersum L.) Agronomic Performance and Tuber Yield at Kokate Sodo Zuria District, Southern Ethiopia. *Ethiopian Journal of Applied Science and Technology*, *10*(1), 28–41.

Abstract

Potato (Solanum tubersumL.) is one of the most important cash and food security crop in Ethiopia. Its production is limited by low soil fertility, lack of quality seeds and diseases. To this effect, field experiment was conducted to evaluate the effect of different blended fertilizer formulas on potato agronomic performance and tuber yield at Kokate Research Station (KRS) and on farmer's field (OnF) in SodoZuria district of southern Ethiopia. The experiment consists of seven treatments: control (no fertilizers), N-P (110-40), N-P-K (110-40-100), N-P-S (110-40-17), N-P-S-B (110-40-17-1), N-P-S-B-Cu (110-40-17-1-1), and N-P-K-S-B-Cu (110-40-100-17-1-1) in kg ha-1. The experiment was set in randomized complete block design with three replications. Potato growth parameter (main stem number and plant height), tuber yield components and tuber yield were superior on OnF to KRS. Tuber number, average tuber weight and tuber size categories significantly (p

Mulugeta, D., Tekalign, M., Sheleme, B., & Selamyihun, K. (2019). Potassium critical level in soil for Teff (Eragrostis tef (Zucc.) Trotter) grown in the central highland soils of Ethiopia. *SN Applied Sciences*, *1*(9), 958.

Abstract

Responses to potassium (K) fertilizer are reported in different parts of Ethiopia in recent years, contrary to the general perception that K fertilizer was not necessary on the soils. However, use of adequate K level for maximum economic yield is possible only when soil test data are calibrated against response curve for a given crop and soil type. This pot trial was conducted to calibrate K soil test with the response of teff (*Eragrostis tef* (Zucc.)) at application of increasing levels of K. Random soil samples (0–20 cm) were collected from 60 locations having Mehlich-3 (M-3) K soil test values ranging from 16 to 910 mg kg⁻¹ across 20 teff growing districts in the highlands of Ethiopia. The relative biomass yield of teff was significantly correlated with Mehlich-3 extractable K, suggesting that the extraction method fairly estimated the available soil K. Soil test M-3

extractable K values were categorized, based on relative biomass yield, as "very low" ($< 55 \text{ mg kg}^{-1}$), "low" ($55-210 \text{ mg kg}^{-1}$), "medium" ($210-280 \text{ mg kg}^{-1}$), "high" ($280-500 \text{ mg kg}^{-1}$) and "very high" ($> 500 \text{ mg kg}^{-1}$). And K application rates of 139 and 54 kg ha⁻¹ for the very low and low K categories respectively would suffice for optimum teff yield. The critical limit of K in soil (M-3) using the graphical method was 210 mg kg⁻¹ for the 85% relative biomass yield level. An inverse relation of yield response to the soil K status was observed suggesting that application of K fertilizer increases yield of teff in low status soils. However, field verification is required to draw sound conclusions.

Desalegn, B. B., Lambert, C., Riedel, S., Negese, T., & Biesalski, H. K. (2019). Feeding Practices and Undernutrition in 6–23-Month-Old Children of Orthodox Christian Mothers in Rural Tigray, Ethiopia: Longitudinal Study. *Nutrients*, *11*(1), 138.

Abstract

Fasting period and fasting status affect the feeding practices and nutritional status of Ethiopian Orthodox mothers. Even if children are exempted from fasting, some mothers do not prepare their food from animal sources as it could contaminate utensils for cooking family foods. Therefore, the objective of this study was to assess feeding practices and undernutrition in 6-23-months old children whose mothers are Ethiopian Orthodox religion followers during lent fasting and nonfasting periods in rural Tigray, Northern Ethiopia, and to identify associated factors. A communitybased longitudinal study was carried out in Ethiopian Orthodox lent fasting and non-fasting periods. Using a multi-stage systematic random sampling technique, 567 and 522 children aged 6-23 months old participated in the fasting and non-fasting assessments, respectively. Statistical analyses were done using logistic regression, an independent sample *t*-test, Wilcoxon signed-rank (WSRT) and McNemar's tests. The prevalences of stunting, underweight and wasting were 31.6– 33.7%, 11.7–15.7% and 4.4–4.8%, respectively. The weight-for-height (WHZ) and height-for-age (HAZ) values for children of fasting mothers were significantly lower (p < 0.05) compared to those of non-fasting mothers. Likewise, the median weight-for-age (WAZ) and diet diversity score (DDS) of children of fasting mothers were also significantly higher in non-fasting than in fasting periods. A small proportion of children (2.3-6.7%) met the minimum acceptable diet (MAD) in the study population, but these measures were significantly increased (p < 0.001) in the children of non-fasting mothers. Mother's fasting during lactation period of the indexed child was amongst the independent factors common in child stunting, underweight and wasting. Nutritional status and feeding practices of 6–23-month-old children are affected by maternal fasting during the fasting period. Therefore, without involvement of religious institutions in the existing nutritional activities, reduction of undernutrition would not be successful and sustainable.

Keywords: Stunting; Wasting; Undernutrition; Minimum acceptable diet; Minimum diet diversity; Tigray; Orthodox fasting; Ethiopia

Belay, G., & Negesse, T. (2019). LIVESTOCK FEED DRY MATTER AVAILABILITY AND UTILIZATION IN BURIE ZURIA DISTRICT, NORTH WESTERN ETHIOPIA. *Tropical and Subtropical Agroecosystems*, 22(1).

Abstract

Availability of feed resources, their utilization and balance between supply and demand in Burie Zuria district, north western Ethiopia, were assessedusing focus group discussion, individual interview, key informant interview and secondary data. Data was collected from February to April 2017 on 90, 30 and 30 households (HH)Hs selected from mid, high and low altitudes, respectively, using multi-stage sampling techniques. Data was analysed using FEAST version 2.21 and SPSS version 20.0. Mean land holding, livestock holding and family size were 1.8 ha, 9.03Tropical livestock unit (TLU) and 6.82 persons/HH, respectively. Crop residues, stubble grazing and natural pasture were major feed resources. Maize stover, finger millet and teff straws were the main crop residues produced in all agroecosystems (p<0.05). Inappropriate collection, conservation and feed processing practices reduced efficiency of utilization. Utilizable dry matter (DM) supply was 12.87±0.41 t/HH/yr; and 7.2±0.69, 14.6±0.47 and 15.38±0.66 were from high, mid and low altitudes, respectively; crop residues contributed major part (9.76±0.76 t)(p<0.05). Annual livestock maintenance DM requirement was 20.37±4.14 t/HH/yr with a deficit of 7.5±3.73 t, with DM requirement of 18.25±4.49, 26.78±4.14 and 16.09±3.83t/HH/yr (p<0.05) for high, mid and low altitudes, respectively. Available DM satisfies 63.18 % of DM requirements, where 39.45, 54.51 and 95.58 % (p<0.05) were for high, mid and low altitudes, respectively (p<0.05), indicating

more feed shortage at high altitude. In conclusion, the main feed resource is crop residue with low DM contribution. Thus appropriate crop residues management should be used.

Keywords: Agro-ecology; Feed availability; Feed balance; Nutrient utilization

Begna, R., Urge, M., Negesse, T., & Animut, G. (2019). Chemical composition and in-vitro digestibility of sugarcane bagasse and rice husk treated with three strains of white rot fungi and effective microorganism. *Biotechnology in Animal Husbandry*, *35*(1), 71–83.

Abstract

A study was conducted to evaluate the effect of biological treatments of sugarcane bagasse (SCB) and rice husk (RH) with three strains of white-rot fungi (WRF) (Pleurotusostreatus (Po), Pleurotusflorida (Pf) and Trichodermaviride (Tv) and effective microorganism (EM) on the chemical composition and in-vitro digestibility. The experiment consisted of 2x5 factorial arrangements, two levels of feed (SCB and RH) and five levels of biological treatments (Control, Po, Pf, Tv, and EM). Treatment of RH with EM, Tv, Po and Pf, significantly increased crude protein content from 7.90% in untreated to 7.92, 10.46, 10.61 and 11.35%, respectively. The corresponding increase in CP% of sugarcane from 2.61% was 3.41, 5.96, 5.89 and 5.95%. Treatments significantly (P<0.001) decreased neutral detergent fiber, acid detergent fiber, acid detergent lignin cellulose and hemicelluloses contents with the lowest value recorded for Tv. The IVOMD, IVDMD and metabolizable energy (ME) were significantly (P<0.001) increased. In conclusion, the study indicates that treatment of RH with Trichodermaviride and SCB with EM is more effective than others in improving the nutritive value of the roughages. We suggest evaluation of the treated roughages on animal performance.

Keywords: In-vitro digestibility, White-rot fungi, Effective microorganism, Sugar cane bagasse, Rice husk Derebe, A. D., Roro, A. G., Asfaw, B. T., Ayele, W. W., & Hvoslef-Eide, A. K. (2019). Effects of solar UV-B radiation exclusion on physiology, growth and yields of taro (Colocasia esculenta (L.)) at different altitudes in tropical environments of Southern Ethiopia. *Scientia Horticulturae*, *256*, 108563.

Abstract

Plants are sessile by nature, they have to be able to cope with exposure to many biotic and abiotic stress factors, including solar UV-B radiation. The degree of stresses varies with geographic locations. The impact of solar UV radiation on growth, physiology and yield of taro (Colocasia esculenta (L.)) at different altitudes under tropical environments was evaluated in Southern Ethiopia at 1500 m, 1800 m and 2200 m a.s.l. The experiment was conducted under open field conditions, and was compared to the yield of taro under UV-B blocking plastic film at every location. Four taro cultivars ('Black', 'Boloso-1', 'Purple' and 'White') were used as planting materials. Each treatment was planted using RCB design with three replications. The result indicates that leaf number, shoot number, leaf area and leaf area index under UV-B exclusion were found to be higher at higher elevation than either lower or middle elevation for 'Boloso-1' and 'Black' cultivars. Exclusion of UV-B spectrum from solar radiation improved the number of leaves and the leaf area index, for two cultivars: 'Black' and 'Boloso-1'. Blocking UV-B radiation also significantly enhanced stomata conductance, photosynthesis rate stomata opening area, stomata number and dry matter in 'Boloso-1', compared to other cultivars. However, physiologically 'Purple' cultivar did not respond to solar UV-B irradiation. Among all the cultivars, 'Boloso-1' was found to be a good candidate for maximum corm size, marketable and maximum total yield production in all test locations irrespective of solar UV-B irradiation. In conclusion, vegetative growth of taro cultivars responded better to altitudinal variation than variability of UV-B irradiation. Whereas, physiological parameters like stomata number, stomata opening area, stomata conductance and photosynthesis of different taro cultivars responded stronger to the level of UV-B irradiation than the altitude.

Keywords: Taro, UV-B radiation, Stomata conductance, Corm, Cormels

Teferra, T. (n.d.). Direct and Indirect Actions of Inulin as Prebiotic Polysaccharide: A Review. *CPQ Nutrition*, 3(6), 1–15.

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 physico-chemical 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

Tefera, D. A., & Bijman, J. (2019). Cooperatives in Modern Food Supply Chains: A Case Study of the Malt Barley Sector in Ethiopia. In *Design and Management of Interfirm Networks* (pp. 217–237). Springer.

Abstract

Increases in food demand, product differentiation, and agribusiness growth provide new market opportunities for smallholders in Africa. Yet, smallholders face challenges of meeting quality, volume, and timing requirements to capture these opportunities. Cooperatives have been identified as a strategy to improve smallholder linkage to evolving food systems, by providing various supply chain services. However, empirical evidence is sparse on the performance of cooperatives in commercializing farm products and coordinating supply chain integration. In addition, a debate exists on which farmers are more likely to be member of a cooperative. In other words, do all smallholders have an equal chance of benefitting from the activities of cooperatives? Ethiopian malt barley cooperatives are used as an empirical case. Mixed methods were used to collect and analyze primary data. Our case study analysis shows that cooperatives provide diverse services, including contract brokerage, output marketing, input supply, and provision of technical assistance. Our empirical results also show that the members of these marketing cooperatives have larger landholdings, better farm resources, and better access to extension services compared to non-member farmers.

Keywords: Cooperatives Farmers Supply chain collaboration Marketing Multinationals Beers brewers Barley Ethiopian Inclusiveness

Tolessa, T. T., Keneni, G., Mohammed, H., & Ahmed, S. K. (2019). Decades of Faba Bean (Vicia faba L.) Breeding for Better Grain Yield and Seed Size has Inadvertently Reduced G× E Interaction and Increased Inter-Temporal Performance Stability. *Journal of Crop Science and Biotechnology*, 22(3), 265–274.

Abstract

Decades of Faba Bean (Vicia faba L.) Breeding for Better Grain Yield and Seed Size has Thirteen faba bean varieties including 11 released between 1977 and 2007 and two promising genotypes were evaluated at seven contrasting environments in the central and southeastern highlands of Ethiopia during the main cropping seasons of 2007/2008 and 2008/2009. The objectives of the study were to evaluate temporal genetic progresses made over three decades of breeding in patterns of $G \times E$ interaction and performance stability of the varieties developed in due course for grain yield and seed size of faba bean. The study was conducted using a randomized complete block design with four replications. Regression coefficients (bi) of genotypes over years of release as a stability parameter showed a steadily but smoothly decreasing trend at the rate of 9.0×10^{-3} year⁻¹ (r = -0.60; P \leq 0.01), indicating that varietal performance stability increased with time. Trend analysis based on AMMI stability value (ASV), genotypic selection index (GSI), Shukla stability variance (σi^2), and Kang's rank sum (KRS) values of grain yield also revealed an increasing yield stability over the years of release. For seed size, GSI and KRS values decreased with time. The coefficient of variability (CV) for grain yield and seed size also tended to temporally decline while sustainability index (SuI) increased across the year of releases indicating that there was no performance stability sacrificed to achieve the greater yield potential with larger seed size. Therefore, this data support that selection of new genotypes that yield well at multiple environments, specifically genotypes with large seed size and resistance to disease as a method to increase performance stability.

Terfa, M., & Torre, S. (2018). Impact of lighting conditions during forcing on flowering time, morphology and postharvest transpiration of Hydrangea macrophylla. 405–412.

Abstract

In this study, the main objective was to evaluate the impact of lighting conditions and to test effects of continuous lighting and light quality on morphology, number of flowering shoots, flowering time and postharvest transpiration. *Hydrangea macrophylla* 'Clarissa' was forced in controlled climate chambers. Extending the photoperiod from 16 to 24 h with high pressure sodium lamps (HPS) did not affect forcing time or morphology, but postharvest transpiration was more than 50% higher when the plants were forced at 24 h compared to 16 h lighting. Additional blue light (30% BL, 400-500 nm) in combination with HPS (HPS + BL) did not change the postharvest transpiration compared to HPS but resulted in more compact plants and one week earlier flowering. White light emitting diodes (LEDs) with 20% BL induced more compact plants, compared to HPS, but the flowering was delayed by one week, and postharvest transpiration increased compared to HPS.

Gebremariam, S. N., & Marchetti, J. M. (2019a). Techno-economic performance of a biorefinery for the production of fuel-grade biofuel using a green catalyst. *Biofuels, Bioproducts and Biorefining*, *13*(4), 936–949.

Abstract

There are different technologies for biodiesel production, each having its benefits and drawbacks depending on the type of feedstock and catalyst used. In this study, the techno-economic performances of four catalyst technologies were investigated. The catalysts were bulk calcium oxide (CaO), enzyme, nano-calcium oxide, and ionic liquid. The study was mainly based on process simulations designed using Aspen Plus and SuperPro software. The quantity and quality of biodiesel and glycerol, as well as the amount of biodiesel per amount of feedstock, were the

parameters to evaluate technical performances. The parameters for economic performances were total investment cost, unit production cost, net present value (NPV), internal return rate (IRR), and return over investment (ROI). Technically, all the studied options provided fuel quality biodiesel and high purity glycerol. However, under the assumed market scenario, the process using bulk CaO catalyst was more economically feasible and tolerable to the change in market values of major inputs and outputs. On the contrary, the enzyme catalyst option was very expensive and economically infeasible for all considered ranges of cost of feedstock and product. The result of this study could be used as a basis to do detail estimates for the practical implementation of the efficient process.

Keywords: biodiesel; CaO catalyst; Nano-catalyst; Ionic liquid catalyst; Economic analysis

Mustefa, A., Gizaw, S., Banerjee, S., Abebe, A., Taye, M., Areaya, A., & Besufekad, S. (2019). Growth performance of Boer goats and their F1 and F2 crosses and backcrosses with Central Highland goats in Ethiopia. *Livestock Research for Rural Development*, *31*, 6.

Abstract

This study aims to investigate genetic and non-genetic factors affecting growth performance of Boer goats and their crosses with Central Highland goats (CHG) reared on-station at Ataye site of Debre-Birhan Agricultural Research Center in Ethiopia. A total of 512 kids of Boer (B), F1 (B X CHG) and F2(a) (F1 X F1) crossbreds and backcrosses F2(b) (B X F1) born from 381 kiddings recorded between 2012 and 2017 were used for the analysis of body weight at birth, at weaning, at sixmonth, at yearling and body weight gain to weaning, weaning to six-month and sixmonth to yearling. The overall least-squares means across genotypes for birth weight (BW), weaning weight (WW), six-month weight (6MW), yearling weight (YW) were 3.05 ± 0.06 kg, 10.9 ± 0.36 kg, 12.5 ± 0.51 kg and 18.3 ± 0.88 kg, respectively for Boer and 2.62 ± 0.04 kg, 8.80 ± 0.22 kg, 11.2 ± 0.31 kg and 16.7 ± 0.48 kg, respectively for F1. Similarly, the BW and WW of the F2(a) and F2(b) were (2.50 ± 0.13 kg and 8.37 ± 0.74 kg) and (2.94 ± 0.15 kg and 9.80 ± 0.75 kg) respectively. The overall least-squares means across breed groups for daily weight gain to weaning, weaning to six-month and six-month to yearling were 83.9 ± 3.76 g, 25.6 ± 3.29 g and 27.6 ± 2.69 g, respectively for Boer, and 67.0 ± 2.26 g, 31.5 ± 2.00 g and 28.4 ± 1.46 g, respectively for F1. Similarly, daily weight gains

to weaning was 67.7 ± 7.66 g and 78.7 ± 7.74 g for the F2(a) and F2(b) respectively. Sex, type of birth, year of birth and season of birth affected the studied traits, while, doe parity has no significant effect except at the later age weight gain. In conclusion, the overall growth performances of all the studied genotypes were below expectations which indicates their sub-optimal adaptability to the study area. In addition to the genotype, the non-genetic factors affect the growth performance, so improvement in growth performances is possible by minimizing environmental effects.

Mustefa, A., Banerjee, S., Gizaw, S., Taye, M., Getachew, T., Areaya, A., Abebe, A., & Besufekad, S. (2019). Reproduction and survival analysis of Boer and their crosses with Central Highland goats in Ethiopia. *Development*, *31*, 10.

Abstract

Doe reproduction and kid survival performances of Boer and their crosses with Central Highland goats were evaluated in Ethiopia. Survival data on a total of 519 kids born from an on-station Boer x Central Highland goats cross-breeding program recorded within the period 2012 – 2017 were analyzed using Weibull proportional hazard models of the survival kit version 6.0. Reproduction data were analyzed using the General Linear Model and logistic regression procedures of SAS 9.0. The overall percentages of conception, kidding and abortion of does were 48.9%, 37.6% and 10% respectively. Breed group and non-genetic factors influence the studied traits, indicating Boer does had the lowest conception and kidding rate. The overall leastsquares means for litter size at birth and at weaning, litter weight (kg) at birth and at weaning were 1.4±0.03, 0.67±0.03, 3.63±0.07 and 10.68±0.28 respectively. The litter size at birth and at weaning were not affected by the doe breed group while the litter weight at birth and at weaning was highest for the Boer does. The overall kid survival up to day 4, 90, 180 and 365 were 73.99%, 53.57%, 47.98% and 40.27% respectively. Kid survival was affected by type of birth, season of birth and year of birth, indicating single born kids had higher survival rates than multiple born kids throughout the studied ages. Kid breed, kid sex and doe parity did not affect survivability at all ages. The attempt which was aimed genetic improvement through crossbreeding with exotic Boer goats in Ethiopia was blocked by their poor reproduction and survival. Therefore, it is advisable to try to bring genetic improvement through within breed selection among the indigenous goat breeds (CHG) in terms of reducing importation cost, conservation and adaptation.

Key words: conception, cross-breeding, risk ratio, Weibull

Raji, S. G., Tzanakakis, V., & Dörsch, P. (2019). Bradyrhizobial inoculation and P application effects on haricot and mung beans in the Ethiopian Rift Valley. *Plant and Soil*, *442*(1–2), 271–284.

Abstract

Aims

To investigate factors limiting biological nitrogen fixation (BNF) by grain legumes in the Ethiopian Rift Valley in soils with different input legacies.

Methods

Two field experiments were set up, at a high-input (Hawassa) and a low-input (Lokabaya) site, comparing each two varieties of haricot bean (*Phaseolus vulgaris* var. Hawassa dume and Awash1) and mung bean (*Vigna radiata* var. N26 and Sunaina) throughout two cropping seasons, with and without commercially available inoculants and/or phosphorous addition (2nd year only). Symbiotic performance was evaluated by estimating the proportion of N derived from the atmosphere (%Ndfa) using ¹⁵N natural abundance.

Results

Mean Ndfa of haricot bean ranged from 31 to 57% at Hawassa and 56 to 57% at Lokabaya with inconsistent differences between varieties and years. Mung beans had lower Ndfa values than haricot beans, but performed better at the low-input (47–53%) than the high-input (9–24%) sites. Overall, haricot bean fixed more N at Hawassa (71–99 kg ha⁻¹) than at Lokabaya (17–36 kg ha⁻¹), while BNF by mung bean was small at both sites (8–25 kg N ha⁻¹). Both Ndfa and N yields responded positively to P addition in the second year, which roughly resulted in 50% increase in BNF by both beans at the low-input site Lokabaya but not at the high-input site Hawassa. Combining P addition with rhizobial inoculation increased BNF and N yields, but there was no significant difference to P addition alone.

Conclusions

Low soil fertility typical for the Rift Valley smallholder farms strongly constrains grain legume yields despite good symbiotic performance. In marginal soils, inoculation together with P addition may increase Ndfa to high values (> 60%) in haricot bean, but N yields remain small relative to

yields obtained in high-input soil. This indicates that the large yield gap commonly experienced by smallholder farmers cannot readily be overcome by the use of inoculants or P fertilization and that long-term soil fertility management is needed to increase haricot bean productivity in the region. By contrast, mung bean, which had similar yields with haricot bean in the marginal soil, is responsive to P addition and may thus be a valid alternative for small holders with marginal soils.

Nielsen, M. P., Yoshida, H., Raji, S. G., Scheutz, C., Jensen, L. S., Christensen, T. H., & Bruun, S. (2019). Deriving environmental life cycle inventory factors for land application of garden waste products under northern european conditions. *Environmental Modeling & Assessment*, 24(1), 21–35.

Abstract

The amount of waste which is being recycled is increasing in Europe. Garden waste is increasingly composted and land applied. However, composting to full maturity requires resources in terms of space, equipment and labour. Alternatives could include a simple shredding, or composting for a shorter time. Finally, an option could be to remove trunks and large branches which are not easy to compost and incinerate them to recover energy. In order to assess these options and the associated environmental impacts, it is necessary to have good estimates of emissions and other inventory factors during the different steps of the life cycle of the compost products. Especially, the impacts occurring after land application are difficult to estimate. The objective of the current paper is to estimate environmental inventory factors for land application of four garden waste products: shredded garden waste, shredded garden waste after removal of the woody fraction, immature garden waste compost and mature garden waste compost. Soil incubations of the materials were conducted in order to assess the carbon (C) and nitrogen (N) dynamics occurring after incorporation in soil. Subsequently, the results were used to calibrate the mineralisation kinetics of the materials in the agroecosystem model Daisy. Subsequently, the model was used to simulate C and N dynamics under different environmental conditions and emissions to the environment and used to derive inventory factors. Nine soil and climate combinations were included in the simulation study to cover local conditions commonly found in Northern Europe. The degradability of the garden waste products increased when the woody fraction of garden waste was removed and generally the degradability of the product was decreased by composting. All

four products showed initial immobilisation of N in soil, but it was clear that removal of the woody fraction and composting reduced the length and severity of the immobilisation phase. The approach taken in the current paper using soil incubations to estimate decomposition parameters for the materials and subsequently an agroecosystem model to extrapolate the observations proved efficient at estimating inventory factors under various environmental conditions and fertilisation levels. Under low N availability conditions, the harvest factor, which estimates the fraction of N harvested in response to application of an amount of compost ranged between 0.10 and 0.18 for a sandy loam soil and medium precipitation conditions for Northern European while it ranged from negative values to 0.12 under conditions of ample N supply. These results were also clearly reflected in the emission factors for N leaching to the groundwater and losses to surface water, which were higher under high N availability than under low. The harvest factor, emission factors for ammonia, N leaching to ground water and loss to surface water proved to be very dependent on the local conditions like the soil type, precipitation regime and general fertilisation level, whereas the biochemical composition of the materials was of less importance for these factors. In contrast, the C sequestration factor was almost unaffected by the environmental conditions but depended to a large extent on the degradability of the added material.

Gerura, F. N., Meressa, B. H., Martina, K., Tesfaye, A., Olango, T. M., & Nasser, Y. (2019). Genetic diversity and population structure of enset (Ensete ventricosum Welw Cheesman) landraces of Gurage zone, Ethiopia. *Genetic Resources and Crop Evolution*, 66(8), 1813–1824.

Abstract

Enset (*Ensete ventricosum* (Welw.) Cheesman), which feeds around 20 million Ethiopian people, is a unique crop; with all parts of the plant are utilizable. It is, arguably, less researched crop and the mode of production remained conventional. Understanding the extent of genetic diversity in the crop, especially making use of genotyping data, is a very important first step in the genetic improvement of the crop. Twelve polymorphic enset SSR markers were used to assess the genetic diversity and population structure of 79 cultivated landraces and four wild enset individuals collected from different enset growing locations of Ethiopia. The polymorphic information content of markers ranged from 0.62 to 0.77 with a mean value of 0.69. A total of 77 alleles were identified, and the average observed heterozygosity varied from 0.51 to 0.67. A mean gene diversity of 0.59

was recorded ranging from 0.55 to 0.62. The AMOVA revealed that within population allelic variations contributed more to the genetic diversity than among population variations. Discriminant Analysis of Principal Components and population structure analysis grouped the 83 enset germplasms into three major clusters, where the wild individuals clustered distinctly. Outcomes of this research provide valuable information for enset conservation and breeding strategies especially for development of resistance for bacterial wilt and nematode attacks.

Teramage, M. T. (2019). Temporal distribution of Fukushima-derived 137 Cs in coniferous forest soil evaluated based on compartment-exponential model. *Environmental Science and Pollution Research*, *26*(36), 36913–36921.

Abstract

Based on the compartment and exponential models, the distribution of Fukushima-derived ¹³⁷Cs was evaluated at four sampling dates in undisturbed coniferous forest soil. The compartment model was employed to evaluate the dynamic of ¹³⁷Cs in the three sub-sections of the forest floor (FF), namely undergrowth (UG), litter layer (OL), and fragmented litter layer (OF), while the exponential model was administrated to describe its distribution below the FF. According to the compartment model, the derived ecological half-life of ¹³⁷Cs in the UG, OL, and OF layers was 0.97, 1.1, and 4.9 years, respectively, indicating ¹³⁷Cs resides much longer in the OF layer. Hence, this soil section remains a potential source of radiation dose mainly due to its high ¹³⁷Cs content associated with low attenuation effect. Below the OF layer, the ¹³⁷Cs distribution was well described by exponential model and its derived relaxation lengths were in the range of 0.8–1.4 cm, implying the migration of ¹³⁷Cs in mineral soil is very slow and almost intact during the observation time. Collectively, our results highlighted that the compartment model for the FF and the exponential model for the soil below the FF are adequate enough to generate essential information. Thus, the potential decontamination measures should have to be chosen on their effect on the FF's ¹³⁷Cs.

Chen, L., Cao, Y., Zhang, Z., Liu, X., Teramage, M. T., Zhang, X., & Sun, X. (2019). Characteristics of chemical components in the trunk xylem sap of pine trees by means of a centrifugation collection method. *Plant Physiology and Biochemistry*, *142*, 482–489.

Abstract

Knowledge of the characteristics of chemical components transported in the xylem sap of trunks remains deficient and limited because no appropriate method exists to extract the xylem sap from this part of the tree. We thus explored the differences in xylem sap components extracted by means of centrifugation and water displacement methods and depicted the level and behavior of chemical components in the xylem sap of trunks and branches of different aged trees from a pine forest in northern China. There were no significant differences between the two methods with respect to nitrogen (N) compounds and inorganic ions in the xylem sap. Potassium concentrations obtained by the methods were similar and consistent with the values obtained from earlier publications on woody species. This suggests that contamination of the xylem sap by the centrifugation method is negligible, and this method would be a reliable and robust tool for collection of the trunk xylem sap. Dissolved organic N was the dominant component of total N followed by nitrate (NO₃⁻) and ammonium (NH_4^+). Potassium and chloride were the predominant cation and anion, respectively, of the xylem sap. The NO₃⁻ concentration basically did not change, whereas the NH4⁺ concentration was larger transported from the trunk to branches for the large tree class during foliage senescence. More inorganic N components (mainly NO₃⁻) were found in young trees than in old trees. Our study contributes to improve the diagnostic assessments of tree physiological processes and growth in mature forest trees under environmental changes.

Adugna, G., & Haile, W. (2019). Yield and Nitrogen Uptake of Wheat as Affected by Nitrogen Fertilizer and Compost in the Central Rift Valley of Ethiopia. *Ethiopian Journal of Agricultural Sciences*, 29(1), 85–97.

Abstract

Integrated applications of organic and inorganic nutrient sources are indispensable for enhanced nutrient use efficiency and crop yields. However, it requires determination of the optimum combination of these resources based on soil type, crop species, and location. Cognizant of this fact, an experiment was conducted to determine the optimum levels and combinations of compost and inorganic N fertilizers for maximum profitable grain yield of wheat at Melkassa under irrigation in 2014. The experiment involved factorial combinations of four rates of N (0, 23, 46 and 69 kg ha-1) and four levels of compost (0, 5.6, 11.2, and 16.8 t ha-1) laid out in RCB design with three replications. The results revealed that both chemical N and compost and their interactions significantly and positively affected the yield of wheat and N uptake. The highest grain yield was obtained from the combined applications of chemical N and compost than that obtained from N and compost applied alone. Accordingly, combinations of 69 kg N ha-1 and 5.6 t ha-1 produced optimum grain yield and realized the maximum net returns of wheat. Significantly, higher N uptake was obtained from the combined application of N and compost than that obtained from either source applied alone. Therefore suggested that combination of 69 kg mineral N ha-1 and 5.6 t ha-1 compost are the best combination to achieve sustainable yield.

Global Burden of Disease Cancer Collaboration. (2019). Global, regional, and national cancer incidence, mortality, years of life lost, years lived with disability, and disability-adjusted life-years for 29 cancer groups, 1990 to 2017: A systematic analysis for the global burden of disease study. *JAMA Oncology*, *5*(12), 1749–1768.

Abstract

Importance: Cancer and other noncommunicable diseases (NCDs) are now widely recognized as a threat to global development. The latest United Nations high-level meeting on NCDs reaffirmed this observation and also highlighted the slow progress in meeting the 2011 Political Declaration on the Prevention and Control of Noncommunicable Diseases and the third Sustainable Development Goal. Lack of situational analyses, priority setting, and budgeting have been identified as major obstacles in achieving these goals. All of these have in common that they require information on the local cancer epidemiology. The Global Burden of Disease (GBD) study is uniquely poised to provide these crucial data.

Objective: To describe cancer burden for 29 cancer groups in 195 countries from 1990 through 2017 to provide data needed for cancer control planning.

Evidence Review: We used the GBD study estimation methods to describe cancer incidence, mortality, years lived with disability, years of life lost, and disability-adjusted life-years (DALYs). Results are presented at the national level as well as by Socio-demographic Index (SDI), a

composite indicator of income, educational attainment, and total fertility rate. We also analyzed the influence of the epidemiological vs the demographic transition on cancer incidence.

Findings: In 2017, there were 24.5 million incident cancer cases worldwide (16.8 million without nonmelanoma skin cancer [NMSC]) and 9.6 million cancer deaths. The majority of cancer DALYs came from years of life lost (97%), and only 3% came from years lived with disability. The odds of developing cancer were the lowest in the low SDI quintile (1 in 7) and the highest in the high SDI quintile (1 in 2) for both sexes. In 2017, the most common incident cancers in men were NMSC (4.3 million incident cases); tracheal, bronchus, and lung (TBL) cancer (1.5 million incident cases); and prostate cancer (1.3 million incident cases). The most common causes of cancer deaths and DALYs for men were TBL cancer (1.3 million deaths and 28.4 million DALYs), liver cancer (572 000 deaths and 15.2 million DALYs), and stomach cancer (542 000 deaths and 12.2 million DALYs). For women in 2017, the most common incident cancers were NMSC (3.3 million incident cases). The leading causes of cancer deaths and DALYs for women in 2017, the most common incident cancer (819 000 incident cases). The leading causes of cancer deaths and DALYs for women were tract (1.9 million incident cases), and colorectal cancer (819 000 incident cases). The leading causes of cancer deaths and DALYs for women were breast cancer (601 000 deaths and 17.4 million DALYs), TBL cancer (596 000 deaths and 12.6 million DALYs), and colorectal cancer (414 000 deaths and 8.3 million DALYs).

Conclusions and Relevance: The national epidemiological profiles of cancer burden in the GBD study show large heterogeneities, which are a reflection of different exposures to risk factors, economic settings, lifestyles, and access to care and screening. The GBD study can be used by policy makers and other stakeholders to develop and improve national and local cancer control in order to achieve the global targets and improve equity in cancer care.

Teshome, G., Bosha, T., & Gebremedhin, S. (2019). Time-to-recovery from severe acute malnutrition in children 6–59 months of age enrolled in the outpatient treatment program in Shebedino, Southern Ethiopia: A prospective cohort study. *BMC Pediatrics*, *19*(1), 33.

Abstract

Background

In Ethiopia uncomplicated severe acute malnutrition (SAM) is managed at health posts level through the outpatient therapeutic program (OTP). Yet, evidence on the treatment success rate of the program is scarce. This study determines the treatment outcomes and predictors of time-to-

recovery among children 6–59 months of age with SAM managed at the health posts level in Shebedino district, Southern Ethiopia.

Methods

This was a prospective cohort study that enrolled 216 children with SAM identified through a campaign conducted in May 2015 and treated over eight weeks at 25 health posts of the district. The average time-to-recovery was estimated using Kaplan-Meier survival curve and the independent predictors of the recovery were determined using multivariable Cox-proportional hazard model. The outputs of the analyses are presented via adjusted hazard ratio with 95% confidence intervals (AHR, CI).

Results

At the end of the eight weeks of treatment 79.6% (95% CI: 74.2–85.0%) of cases recovered from SAM with a weight gain rate of 5.4 g/kg/day. The median time-to-recover was 36 days. The analysis indicated, maternal illiteracy (0.54, 0.38–0.78), severe household food insecurity (0.47, 0.28–0.79), walking for more than 1 h to receive the treatment (0.69, 0.50–0.96), diarrhoea co-morbidity (0.63, 0.42–0.91) and practicing sharing of ready to use therapeutic food (RUTF) (0.53, 0.32–0.88) were associated with slower propensity of recovery from SAM. Children who were enrolled with marasmus diagnosis showed lower recovery than children with kwashiorkor (0.30, 0.18–0.51).

Conclusion

The median time-to-recover was 36 days. Discouraging sharing of RUTF, appropriate management of diarrhoea in SAM cases and improving access to OTP sites can help to improve the treatment outcome for SAM.

Diddana, T. Z. (2019). Factors associated with dietary practice and nutritional status of pregnant women in Dessie town, northeastern Ethiopia: A community-based cross-sectional study. *BMC Pregnancy and Childbirth*, *19*(1), 517.

Abstract

Background

Maternal undernutrition is highly prevalent in resource-poor settings. Hence, this study was intended to determine factors associated with the dietary practice and nutritional status of pregnant women in Dessie town, northeastern Ethiopia.

Methods

Community-based cross-sectional study design was employed. Six hundred four (604) pregnant women have participated. A two-stage sampling method was applied to select participants. Sociodemographic and socio-economic data were collected using a structured interviewer-administered questionnaire. The dietary practice was measured using 13 dietary practice questions. Mid upper arm circumference (MUAC) was measured by standard nonstretchable MUAC tape. Data were entered into Epi-Info 7 and exported to SPSS version 20. Binary and multiple logistic regression analysis was conducted. Variables with P < 0.2 in bivariate analysis were entered for multiple logistic regression. At a 95% confidence interval, variable with $\Re < 0.05$ in multiple logistic regression analysis was considered statistically significant.

Result

About 54.8% of the pregnant women had poor dietary practice and 19.5% were undernourished. First trimester of pregnancy (AOR = 0.46; 95% CI: 0.26, 0.80), no history of illness 2 weeks before data collection date (AOR = 0.42; 95% CI: 0.22, 0.80), poor perceived severity (AOR = 1.64; 95% CI: 1.15, 2.33), poor perceived benefits (AOR = 1.63; 95% CI: 1.14, 2.32) and poor self efficacy (AOR = 4.74; 95% CI: 2.94, 7.65) were significantly associated with poor dietary practice. Not attending antenatal care (ANC) (AOR = 3.46; 95% CI: 2.07, 5.78), illness (AOR = 1.93; 95% CI: 1.10, 3.5), poor dietary diversity (AOR = 5.92; 95% CI: 3.59, 9.76), poor nutrition knowledge (AOR = 3.03; 95% CI: 1.87, 4.92), poor dietary practice (AOR = 3.25; 95% CI: 1.91, 5.54) and poor perceived self efficacy (AOR = 5.59; 95% CI: 3.56, 8.79) were significantly associated (P < 0.05) with undernutrition.

Conclusion

The dietary practice of pregnant women was suboptimal and nutritional status was relatively high. Being in the first trimester of pregnancy and no history illness were negatively associated while poorly perceived severity to malnutrition, poor perceived benefits, and poor self-efficacy were positively associated with the poor dietary practice. Not attending ANC, history of illness, poor dietary diversity, poor nutritional knowledge, poor dietary practice, poorly perceived self-efficacy were positively associated with undernutrition. Government, health extension workers and other concerned bodies should encourage pregnant women to attend ANC, promote health during pregnancy, strength and counsel to improve dietary diversity and practice of good nutrition. They should focus on the perceived belief of dietary behaviors.

Jagisso, Y., Aune, J., & Angassa, A. (2019). Unlocking the Agricultural Potential of Manure in Agropastoral Systems: Traditional Beliefs Hindering Its Use in Southern Ethiopia. *Agriculture*, 9(3), 45.

Abstract

Manure is often considered a valuable resource for improving productivity in semi-arid tropics. This paper investigated agropastoralist knowledge of the use of manure and barriers that limit manure use in Borana, southern Ethiopia. The potential and actual amounts of manure available on-farm and its relative economic value were estimated. Yield response to manure application was also quantified. Data was gathered using on-farm surveys, focus group discussions, key informant interviews, field observation and on-farm experiments. We found that an enormous amount of manure with substantial fertilizer value and economic benefit had accumulated over the years in studied households in Borana. Our analysis revealed that, on average, more than 74 tons of manure containing 667 kg nitrogen (N)–more than five times the current requirements–had accumulated per farm. This manure has an economic value, in terms of N supply, equivalent to ETB (Ethiopian Birr) 16452 (US\$802). On-farm trials showed that a considerable scope exists for increasing the yields of these marginal lands by using manure. However, because of the traditional beliefs and associated practices, which have prevailed for centuries in the community, this valuable resource is left unused. Having identified the link between traditional beliefs and non-use of manure, the paper sets out possible areas for intervention.

Keywords: Non-use of manure; traditional beliefs; Yield response to manure application; Economic value; Agropastoralists; Southern Ethiopia

Tsige, M. (2019). Who Benefits from Production Outcomes? Gendered Production Relations among Climate-Smart Agriculture Technology Users in Rural Ethiopia. *Rural Sociology*, *84*(4), 799–825.

Abstract

The use of agricultural technologies is generally expected to increase production and household incomes. Gendered disparities in making use of agricultural outcomes could result in inequitable agricultural development. However, too little is known about whether the use of agricultural technologies improves gendered production relations, particularly in the Global South. This study investigates the question of gender-equitable production relations by drawing on empirical data from women and men smallholders involved in conservation agriculture and small-scale irrigation schemes in three study areas in Ethiopia. Findings show that the use of agricultural technologies does not improve unequal gendered production relations; rather, gender norms that exist within patriarchal social structures continue to influence production relations in at least three ways. First, societal norms restrict women from asserting their self-interest in gendered bargaining. Second, there is a customary law in all the study areas that allows men (but not women) to inherit land—thus providing men with better bargaining and decision-making positions over production outcomes, as they bring land to the marriage. Third, the restricted access of women to rural institutional services further contributes to unequal gendered production relations, as these services support men more than women in the use of agricultural technologies for enhanced production.

Teramage, M. T., Carasco, L., & Coppin, F. (2019). Impact of drying and wetting cycles on 137Cs ageing in forest soils contaminated with different input forms. *Journal of Environmental Radioactivity*, 203, 93–97.

Abstract

Water and acetate extractable radiocesium (^{137}Cs) concentrations were monitored for >400 days in soils that were amended with aqueous ^{137}Cs or <u>solid organic</u> sources of ^{137}Cs (plant litter or fragmented organic materials) and subjected to a series of wet-dry cycles. The soils were collected from broadleaf and cedar forests in Fukushima, Japan. In soils amended with aqueous ¹³⁷Cs, the water extractable ¹³⁷Cs fraction was very low (<1%) and decreased over time while it was below the detection limit in soils amended with solid organic sources of ¹³⁷Cs. The acetate extractable ¹³⁷Cs in soil amended with aqueous ¹³⁷Cs also exhibited an exponential decrease over time (~55%–30%) but, remained higher than in soils amended by solid organic sources of ¹³⁷Cs which remained stable (ranging from 2% to 15%). These results collectively indicate that: (1) drying and wetting cycles have little impact on ¹³⁷Cs availability, possibly due to the relatively short observation period; (2) ¹³⁷Cs ageing (increased binding to soil) was apparent only when ¹³⁷Cs was applied in the aqueous form; and (3) both the water and acetate-extractable ¹³⁷Cs fractions were greater for aqueous amended than for solid organic amended soils. More acetate extractable ¹³⁷Cs was observed in soils contaminated with broadleaf materials compared to their cedar counterparts, which may be linked to the nature of the organic material itself. For natural conditions, such kind of information is useful to improve our understanding of the evolution of ¹³⁷Cs availability with time from different contamination sources.

Teferra, T. F., Amoako, D. B., Rooney, W. L., & Awika, J. M. (2019). Qualitative assessment of 'highly digestible'protein mutation in hard endosperm sorghum and its functional properties. *Food Chemistry*, 271, 561–569.

Abstract

Sorghum mutants with altered protein body structure have improved protein nutritional quality; however, practical methods to accurately track heritability of the trait are lacking. We evaluated suitability of the *in vitro* pepsin assay, and a new high-resolution field emission electron microscopy (FE-SEM) method to detect the mutation (HD) in hard-endosperm sorghum; and compared the physicochemical properties of experimental HD sorghums to wild type (LD) lines. FE-SEM reliably resolved sorghum protein body structure, allowing for qualitative classification of sorghum as HD or LD. The pepsin assay was less reliable, with significant variations across environments. Nevertheless, HD lines averaged higher protein digestibility (69.4% raw, 57.6% cooked) than LD lines (61.7% raw, 45.6% cooked). The HD lines also had better water solubility and starch pasting profiles than LD lines. FE-SEM, but not pepsin assay, reliably detects HD nutation in sorghum.

Girard, A. L., Teferra, T., & Awika, J. M. (2019). Effects of condensed vs hydrolysable tannins on gluten film strength and stability. *Food Hydrocolloids*, *89*, 36–43.

Abstract

Depending on their structure, tannins are known to strongly complex proteins and alter their functionality. This study aimed to determine effect of polymeric condensed tannins from sorghum (proanthocyanidins, PA), versus tannic acid (hydrolysable tannins) on rheological properties and stability of wheat gluten films and foams; monomeric catechin was used for comparison. Gluten films were solution-cast and assessed for tensile strength, aqueous solubility, and stability to protease hydrolysis. Wheat flour batter and isolated gliadins, glutenins, and starch viscosity and stability at room temp and under cook-cool cycles were assessed. PA-treated film, but not tannic acid or catechin films, showed increased (p < 0.05) tensile strength (2.2X vs control), and decreased aqueous solubility and protease degradation at pH 2.0, suggesting PA extensively cross-linked gluten. Both PA and tannic acid dramatically improved batter stability vs control and catechin (8% vs 38% separation at 60 min), although PA was more effective over 4 h. Surprisingly, in a cook-cool cycle, PA, but not tannic acid, dramatically increased peak and final paste viscosity (53% and 35%, respectively, vs control). Using isolated flour components, this was found to be largely due to PA uniquely cross-linking denatured gliadin fraction during the heating cycle, likely through hydrophobic interactions with exposed hydrophobic amino acid residues. Our findings indicate that differences in tannin conformation lead to different gluten protein binding mechanisms, which can be uniquely used to expand gluten functionality. The sorghum derived polymeric PA interact more strongly with gluten proteins than tannic acid.

Woldemariam, F., Mohammed, A., Teferra, T. F., & Gebremedhin, H. (2019). Optimization of amaranths–teff–barley flour blending ratios for better nutritional and sensory acceptability of injera. *Cogent Food & Agriculture*, 5(1), 1565079.

Abstract

This study was conducted to optimize the compositions of amaranths, teff and barley flour blending ratios for better nutritional and sensory acceptability of injera. Ten formulations of composite flour were determined using D-optimal constrained mixture design with the aid of MINITAB17 software package. The ingredients were in the range of 40-100%, 0-60% and 0-20% for teff, amaranths and barley, respectively. Proximate and mineral analysis of injera was done using standard methods, and sensory evaluation was made using 5-point hedonic scales. Results of the study showed a significant difference (p < 0.05) in protein, calorie, fiber, calcium, iron, zinc and sensory quality of injera as the compositions of ingredients were changed. Levels of protein and gross energy increased with the increased proportion of amaranths, and addition of barley increased the carbohydrate value of injera. Calcium, iron and zinc contents of injera increased with the increment of amaranths and teff. Overall optimum point protein (11.84– 14.60%), carbohydrate (74.39–79.71%), gross energy (363.68–381.22 kcal/100 g, iron 29.34– 42.44 mg/100 g, calcium 177.42 -430.47 mg/100 g) was found in a range of 40-77.5% for teff, 12.5–60% for amaranths and 0–10% for barley. Acceptability was decreased with increase in the proportion of amaranths and barley. The overall optimum point was found in a range of Amaranths (12.5-60%), barely (0-10%) and teff (40-77.5%) flours. Therefore, the blending of teff, amaranths, and barley flours can improve the proximate and mineral composition of injera.