2014-2015

ZIMBABWE RESEARCH INDEX

RESEARCH COUNCIL OF ZIMBABWE

Leadership, Innovation and Development
PREFACE

The Zimbabwe Research Index (ZRI) is one of the publications produced by the Research Council of Zimbabwe (RCZ) that give information about the latest research developments in Zimbabwe. The ZRI is an annual publication that seeks to promote coordination and collaboration among researchers and research institutes. It lists abstracts from all fields of scientific research pertaining to on going and completed research.

The purpose of the Zimbabwe Research Index is to direct attention to current research being carried out in Zimbabwe to promote collaboration, foster exchange of information and facilitate improved communication within the research community. The information contained in this index was obtained from Government Departments, Universities, Research Institutions, Polytechnic Colleges, Teachers Colleges and Private Organisations.

The received submissions were captured as received, except were there were obvious grammatical errors. It must be noted that some institutions sent research titles instead of abstracts; given the relevance of most of these research studies they have been included in this issue of the Zimbabwe Research Index. Information in this index is listed in the alphabetical sequence of submitting institution’s names.

A total of 598 abstracts were received from 29 institutions for the 2014-2015 Zimbabwe Research Index, showing a marked increase of 150% from 237 entries submitted from 16 institutions in the 2012-2013 Zimbabwe Research Index. The increase in the number of entries received for the 2014-2015 Zimbabwe Research Index shows that there has been intensification of research activities in Zimbabwe over the past two years. The RCZ extends its gratitude to institutions that contributed to the 2014- 2015 Zimbabwe Research Index.

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How to Use the Index

The Zimbabwe Research Index is divided into three parts:

1. **Main Section (pages 7-621).** This section lists research abstracts in full, using the alphabetical sequence of the institution’s, with the Zimbabwe Research Index entry number at the top left hand corner of the entry.

2. **Author Index (pages 622-627).** This lists the names of those authors/researchers whose projects are included in the main section using the alphabetical sequence of the author’s name and indicating the page number where the author’s projects are, in the Zimbabwe Research Index.

3. **Organisation Index (page 628-629).** This lists the institutions responsible for research included in the main section and the page numbers where their research projects are in the Zimbabwe Research Index. The institutions are listed in alphabetical sequence of the institutions names.
African Capacity Building Foundation

1. Africa Capacity Report 2014: Capacity Imperatives for Regional Integration in Africa

ABSTRACT
The Africa Capacity Report (ACR) and its supporting indicators offer inputs for decisions on what to finance to develop capacity. Most countries are doing well on their policy environments and having processes in place to implement policies. Countries are doing less well on achieving development results and least on capacity development outcomes. The Report and its indicators also point to the regulatory and institutional reforms needed to better support public–private partnerships in capacity investment and building—and to the investments needed to further strengthen public administration. And they spotlight the importance of political will to enhance social inclusion and development. Each Report showcases an annual theme of key importance to Africa's development agenda. This year the focus is on the capacity imperatives for regional integration, a core mandate of the ACBF, and on the capacities of the regional economic communities (RECs). The Report outlines what is needed to strengthen the RECs. Integrate capacity building in wider efforts to achieve sustainable development. Assure adequate administrative and financial resources. Emphasize the retention and use of skills, not just their acquisition. And monitor and evaluate all efforts to develop capacity. The capacity dimensions and imperatives for regional integration are crucial today as countries, RECs, specialized regional institutions, and regional development organizations, are developing strategic regional frameworks and building capacity to pursue regional integration across the continent. The ACBF's many regionally oriented interventions help move the regional integration agenda forward by strengthening the RECs as platforms for harmonizing policy and enhancing trade among member countries.

Key words: Regional Economic Communities, Africa Development Agenda, Agenda 2063, Knowledge Sharing, Intra regional Trade, Cross Border Projects and Programs.

Date Completed: 2014

_African Capacity Building Foundation_

**ABSTRACT**

The 2013 Report is the third in a series, focuses on an issue of great importance to Africa: natural resource management. The Report is holistic, yet focused on what African countries need to do individually and collectively to achieve effective management and good governance of the continent's vast natural resource wealth. The discussion covers both renewable and non-renewable endowments, with specific focus on forests, land, water, solid minerals, and petroleum resources. The Report offers analysis of the critical perspectives and contemporary academic and policy debates on the natural resource value chain, including emerging issues such as climate change and green economy. Pragmatic approaches based on original problem solving in different contexts are also presented in each chapter of the Report. To keep the emphasis relevant to the 2012 Africa Capacity Indicators Report, Capacity Development for Agricultural Transformation and Food Security, this volume gives particular attention to issues of capacity development and policy choices for "green growth." The Report, in essence, links the natural resource management discussion with the themes of the two previous ACI Reports (ACIR2011, on state fragility, and ACIR2012, on agricultural transformation and food security.

**Key words:** Capacity Development, Food Security

**Date Completed:** 2013
3. Regionalism and Economic Integration in Africa: A Conceptual and Theoretical Perspective

Sakyi, Daniel and Opoku, Eric Evans Osei

African Capacity Building Foundation

ABSTRACT
A well-established strand of the literature on regionalism and economic integration has made clear that economic, geopolitical, and socio-cultural relationships across the globe, for which Africa is no exception, have been changing rapidly in the last few decades. African leaders have been embracing these concepts as vital elements of their development agenda and have engaged their countries in a number of integration arrangements. This study has investigated regionalism and economic integration in Africa from a conceptual and theoretical perspective. The study identified that (i) the rationalist’s theory of neorealism and neoliberalism, (ii) the social constructivism theory, and (iii) several theories of economic integration are very relevant in explaining the formation of regional and economic blocs in Africa. Theories of economic integration that focus on trade, economic interdependency, monetary, fiscal, and political policy coordination seem to be the main forces driving regionalism and economic integration on the continent. The study revealed transportation and mobility of factors of production, limited intra-African trade, multi-memberships, macroeconomic divergence, and conflicts as key factors hindering the success of regionalism and economic integration in Africa. Although regionalism and economic integration on the continent is plagued with these challenges, there are opportunities and possibilities in the power and energy sectors, the manufacturing sector, and in private-public partnerships that the continent can explore to accelerate Africa’s speed of regional and economic integration, crucial for economic growth and development.

Key words: Economic Integration, Regionalism

Date Completed: 2014
4. Regionalism, Food Security and Economic Development

*Mkandawire, Paul; Nyantakyi-Frimpong, Hanson; Armah, Frederick and Arku, Godwin*

*African Capacity Building Foundation*

**ABSTRACT**

It is remarkable that Africa, with enormous resource endowments and with more than 70 percent of the population engaged in agriculture, cannot feed itself. This background paper offers a critical assessment of the potential of regional trade and integration in addressing the enduring challenge of food insecurity in Africa. Drawing on the literature, the paper argues that regionalism offers enormous opportunities and synergies for enhancing economic growth, food supply, and stability of food prices that cannot be easily addressed by individual countries when they operate in isolation from each other. To demonstrate the potential of regional integration for achieving food security in Africa, this paper starts by providing a conceptual framework that outlines the dimensions that link regional cooperation and food security. An overview of the key policy initiatives that are currently underway at enhancing integration at the continental level and in various regional blocs follows this introduction. The paper then progresses to a review of the extent of economic integration among African countries, with particular focus on the agriculture and food trade. It then presents a discussion on potential areas of integration followed by an examination of capacity issues that need policy attention in order to improve the potential of continental and regional integration in improving national and household food security among African countries.

**Key Words:** Economic Development, Regionalism, Agriculture

**Date Completed:** 2014
ABSTRACT

This research combines Institutional Rational Choice (IRC), the Institutional Analysis and Development (IAD) framework, Return Migration theories and International Development theories to understand how Mozambican highly skilled returnees (HSRs) interact with the institutional setting in the home country while pursuing their personal aspirations. Institutional setting in this context is defined as a multidimensional space of factors – institutions plus other contextual variables co-evolving as they interact with each other – in which HSRs try to mobilize resources over time towards their personal goals. Factors impose elements of order in the context where they operate and they affect the distribution of preferences, incentives, and outcomes. A better understanding of the constraints imposed by these factors/elements on HSRs’ behaviour and personal satisfaction could allow governments in extremely poor countries to prioritize interventions for institutional development given the very scarce resources available. These could have the interacting effect of increasing the capacity of HSRs to contribute to the development of Mozambique and provide positive signals to encourage the return of more.

Key words: Highly Skilled Migration, Brain Drain Inversion, Patterns of Reintegration, Institutional Development

Date Completed: 2013
ABSTRACT

Objectives: This study investigated the level of drug adherence among hypertensive outpatients at a tertiary hospital in Zimbabwe. Specific objectives included measurement of blood pressure (BP) control achievement, estimating prevalence of drug adherence behavior, and establishing the association between drug adherence behavior and achievement of BP control.

Methods and materials: An analytic cross sectional design was applied on a convenience sample of 102 participants using an interviewer administered questionnaire. Self-reported adherence was assessed using the Morisky Medication Adherence Scale.

Findings: The median age of participants was 68.5 years (Q1 61; Q3 76). The majority were female (n = 71; 69.6%). BP control (140/90 mmHg) was achieved in 52% (n = 53). Self-reported drug adherence was 40.2% (n = 42). After multivariate logistic regression analysis, participants with normal BP measurements were more than three times as likely to report maximal adherence to prescribed drug schedules (odds ratio 3.37; 95% confidence interval: 1.38–8.24).

Conclusion: Poor drug adherence behaviour prevails among hypertensive outpatients. This contributes to poor achievement of BP control. The hospital is recommended to set up a specialized hypertension clinic in the Out-patients’ Department where an intensified health education package can be introduced as well as community awareness programs on the importance of medication adherence.

Key words: drug adherence, behavior, hypertension

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**ABSTRACT**

Malaria is one of the commonest killer diseases in the world and a major public health concern (WHO, 2010). Expectant mothers are particularly vulnerable and intermittent preventive treatment in Pregnancy (IPTp) is given during antenatal care to pregnant women in malaria high burden areas irrespective of whether infected or not. (Falade, Yusuf, Fadero, Mokolu, Hamer, Salako, 2007). A review of Manicaland maternal report reflects a decline in the number of mothers coming for subsequent doses of IPTp from 42552 to 33137 in 2013. The current study was conducted to find out factors associated with malaria IPTp compliance among pregnant women attending ANC in Manicaland province. An unmatched 1:1 case control study was carried out among pregnant women attending ANC in Mutasa District. There were 90 cases, 90 controls and 14 key informants. A case was any pregnant woman who attended ANC and received one dose or no dose of malaria IPTp. A control was any woman who attended ANC and received at least two doses of malaria IPTp. Random sampling was used to select one district out of the 5 districts providing IPTp in Manicaland Province. Purposive sampling was used to select key informants. Convenience sampling was done to select health workers on duty the day of data collection was done. 

Majority of the women (71) cases and (81) controls were married. Factors associated with non compliance were: knowledge on Fansidar as the drug used for IPTp (OR: 0.42:95%CI=0.23-0.78); Source of information on IPTp being merely from other pregnant women (OR:2.28:95%CI=1.005 – 5.39); pregnant women that didn't know the frequency of taking the IPTp drug (OR:3.83:95% CI=1.71 – 9.15); Perceived period to take the IPTp drug at 16weeks and 4 weeks apart (OR= 0.33:95%CI=0.18 – 0.61) and do not know the period (OR=2.20:95%CI=1.06 - 4.66). Ability to identify Sample of SP as a brand (OR=0.40: 95%CI=0.18 – 0.83) was also negatively associated with IPTp non-compliance.

There is perceived risk of malaria IPTp drug among pregnant women because they are not adequately informed as most women receive their information from other pregnant mothers. Inadequate knowledge on when to start taking the drugs hence late visit for ANC.SP has a drug associated side effects stated by pregnant women causing hindrance in compliance. There is late booking and accessing of ANC among pregnant women. The health workers had polite attitudes towards the pregnant women at the ANC.

There is need for continuous health education on the initiation of early booking at the ANC considering its benefit. Also, thorough health education and sensitization of malaria IPTp compliance among pregnant women is recommended.

**Key words Used:** ANC, DOT, IPTp.
ABSTRACT

Introduction: Antenatal Care (ANC) is the care that a woman receives during pregnancy and helps ensure healthy outcomes for the woman and the new-borns. The tendency to associate family planning, pregnancy, child birth and child health as “women business”, has often led to the exclusion of men from services where they could also learn more about reproductive, maternal and child health. Male participation in the antenatal care of their spouses has been shown to increase the uptake of interventions prescribed during antenatal visits. This study seeks to establish the factors associated with male uptake of ANC services in Mutare City, Zimbabwe and once these are known, to inform policy at district, provincial and national level.

Method: An unmatched 1:3 case-control study was conducted in Mutare Urban from May to July 2015. Data was collected using an interviewer administered pretested questionnaire and the data analysed using Epi-info 7. Multiple logistic regression was used to identify factors that affect male involvement in ANC.

Results: The study enrolled 56 cases and 135 controls. The level of male participation in ANC services in Mutare city is low (16.7%). The perception that health-workers were overworked [AOR2.78 (95%CI. 1.17; 6.62)] was associated with high male participation. Having attended ANC before [AOR 0.20(95%CI. 0.09; 0.48)] and earning an income averaging between US 100-300 dollars [AOR0.20 (95%CI. 0.08; 0.48)] were independently associated with low male uptake of ANC services in Mutare.

Conclusion: The low participation of males in ANC services in Mutare was attributed to socio-economic factors. Different strategies such as extending clinic hours to 6pm and extending invitations to the men are therefore called upon to make ANC more accommodative and attractive to men.

Key words: male participation, antenatal care, Mutare city
9. Cervical Neoplasia in women living with HIV at cervical cancer screening clinics in Mutare, Zimbabwe

Dr Munyaradzi, Mukuzunga, Prof A Chideme-Munodawafa, Mrs. Elizabeth Mukuzunga, Mr E Chikaka, Dr Mafaune

ABSTRACT

Introduction: Cervical cancer in HIV infected women occurs at a younger age and progresses faster compared to those without the HIV infection. In resource limited setting with HIV prevalence like Zimbabwe, targeted screening of women living with HIV is an option. The aim of the study was to determine the prevalence of cervical neoplasia and the risk factors amongst HIV infected women attending cervical screening clinics.

Methods: A cross sectional study was conducted at visual inspection with acetic acid and cervicography (VIAC) clinics, in Mutare city in Eastern Zimbabwe from May to July 2015. Two hundred and forty four women living with HIV who were screened for cervical cancer were enrolled in the study. Data was collected by an interviewer administered structured and pretested questionnaire. Data was entered and analysed using Epi info version 7.0.

Results: Out of the 242 participants, 77 (31.8%) had cervical abnormality. History of genital warts [AOR 5.80(2.00; 16.90)], having more than one lifetime sexual partner [AOR 3.20(1.16; 8.86)], first pregnancy after the age of 18[AOR 0.32(0.10; 0.97)], CD4 count ≥250copies/mm³ at antiretroviral commencement [AOR 0.27(0.09; 0.85)] and a latest CD4 count ≥ 500 cell/mm³ [AOR 0.25(0.09; 0, 68)] were independent factors associated with cervical neoplasia.

Conclusion: The prevalence of cervical neoplasia among women living with HIV is high and cervical screening should be part and parcel of management of these women. The need of early initiation of highly active antiretroviral cannot be over-emphasised.

Key words: Cervical Neoplasia, women living with HIV
Belvedere Technical Teachers’ College

10. Towards An Accelerated Implementation of Inclusive Education at Belvedere Technical Teachers’ College (BTTC)

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Belvedere Technical Teachers’ College

ABSTRACT

The need for inclusivity is well acknowledged globally and in Zimbabwean education in particular as acknowledged in Sustainable Development Goals 5 and 7 of the 2030 Development Agenda aiming at ‘Transforming our world’. The concepts inclusivity and exclusivity remain elusive and obscured in the Education system in Zimbabwe and seem to have remained at the theoretical level at Belvedere Technical Teachers College. This article therefore qualitatively explores through interviews, documentary analysis and participant observation the state of Belvedere Technical Teachers’ College’s (BTTC) preparedness with regards to implementation of inclusivity. Data collection was done between February and July 2015. The focus is on exploring factors that impede or promote the implementation of inclusivity at BTTC in order to come up with recommendations for an accelerated implementation of inclusivity. The major finding is that, the institution has the will for inclusivity and is making efforts to enable inclusivity. However, the speed at which the developments are being made is a cause for concern and has made some students concluded that they were included in order to be excluded. This is evidenced in the work-shopping of the staff, infrastructural and technological developments and inclusive examination provisions. However, it is recommended that, there is need to speed up the rate at which infrastructure is being developed, need to urgently equip the resource centre, continuous/ formative evaluation of progress made and a budget that allows mainstreaming of the challenged.

Key words inclusivity, exclusivity, implementation
11. An Investigation into Gender Challenges Encountered By Students in Tertiary Institutions in Zimbabwe, With Special Reference to Technical Education: 2012 To 2013

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ABSTRACT
The study was an investigation into the challenges that students in tertiary institutions face as far as career choice in technical subjects is concerned. The challenge begins at high school level where pupils in most of the co-educational schools have technical subjects allocated to them such that traditionally male dominated subjects such as Metalwork, Woodwork, Building Studies and Technical Graphic are assigned to mostly boys and traditionally female dominated subjects are allocated to girls. When students enrol at tertiary institutions the situation is different since both male and female students enrol into the technical subjects available there. For instance at Belvedere Technical Teachers’ College, females freely enrol into subjects that are traditionally male dominated like Metal Technology, Wood Technology, Building Technology and Technical Graphics. Male students also take up traditionally female dominated subjects like Clothing and Textiles Technology and Tourism and Hospitality Management yet some of the students did not have a chance to study related subjects back at high school. The study revealed that there is to some extent a relationship between gender roles and stereotyping and the career choices made by students at tertiary colleges. The results also showed that there is also a link between the school curriculum and choices made by students enrolling at tertiary institutions. The study recommends that career guidance be taken seriously for high school students and that gender mainstreaming be utilized in policy formulation and implementation especially in high school curriculum.

Key words: Gender, sex, patriarchal, stereotypes, equality, equity

Date when study was completed

Study was completed in June 2013
ABSTRACT
Maintenance of facilities in educational institutions has been shown in a substantive body of research to be related to student results and lecturer retention. The quality of maintenance of facilities can be investigated in several ways such as maintenance inventories of state of facilities. In total quality management the customer satisfaction plays an important role. Therefore a customer satisfaction questionnaire is an important instrument for assessing the quality of the maintenance of facilities in an institution. This paper explores the quality of maintenance of facilities in the Mechanical Engineering Division at Bulawayo Polytechnic. A customer satisfaction questionnaire was developed and used to assess the current maintenance needs and customer satisfaction. Data was collected from 94 students and 14 lecturers in 2012 at Bulawayo Polytechnic. The Likert type questions were analysed using SPSS whilst the open ended questions were analysed using content analysis. The 94 students and 14 lecturers indicated an average level of user satisfaction and identified their maintenance needs priorities. Lecturers were less satisfied than the students. Both lecturers and students were least satisfied with the state of the workshops. Recommendation to stakeholders included the extension of use of the customer questionnaire to the other divisions and departments at Bulawayo Polytechnic as well as continued use of the customer feedback questionnaire on a yearly basis.

Key words: maintenance, facilities, institutions of higher learning, polytechnics

Study Completed: January 2013

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ABSTRACT

This paper seeks to address factors that promote research activities at Polytechnics. Data was collected using questionnaires from a population of 80 participants whom some have been involved in research and others hold posts of responsibility. Interviews were held with six key informants from the Senior Management. The interviewed managers indicated a willingness to support research activities. The researchers’ identified factors such as recognition, research culture, funding, time set aside for research and the need to capacitate prospective researchers. Recommendations to stakeholders focused on recognition by the Polytechnic of research done and more involvement by students.

Key words: Research activities, promotion, institutions of higher learning, polytechnics.

Study completed: July 2014
ABSTRACT
The unprecedented economic meltdown resulting in hyperinflation in Zimbabwe in the first decade of the 21 century compelled all sectors of the economy to review or invent new ways of doing business. Sources of funding for running institutions from central government got increasingly stretched as more institutions were opened and resources were dwindling. Entrepreneurship was viewed as one of the strategies necessary to save the situation. This paper reviews literature on entrepreneurial leadership in Higher Education. The literature survey revealed that research has been conducted mainly in the developed western countries, Australia, South America and some eastern countries. In Africa research has been conducted in Nigeria and South Africa, and next to nothing in Zimbabwe. Generally entrepreneurship is viewed as an effective means of stimulating economic growth through generation of greater employment opportunities, the development of local technological base and source of foreign exchange earnings. Consequently mandatory entrepreneurial courses were introduced in Higher Education Institutions to produce entrepreneurial graduates, making entrepreneurship a very important course in higher education institutions. Some authors are of the view that universities are power-houses of knowledge expected to take a lead in producing graduates with entrepreneurial skills and mind sets to tackle unemployment crisis. Others assert that though policy makers and the management of various higher institutions of learning mandatorily introduced entrepreneurship education in all disciplines, these lacked a common framework. Though many papers researched on entrepreneurship education, very few of them directly investigated entrepreneurial leadership. It was concluded that while there was an increasing volume of literature on entrepreneurship, there was not much on entrepreneurial leadership in general and even less on entrepreneurial leadership in higher education. There is a gap to be filled by studying the Entrepreneurial Leadership in Higher Education in Zimbabwe because no literature was identified in covering this critical area.

Key words: Entrepreneurship, Leadership, Entrepreneurial Leadership, Higher Education

Study: on going
15. Accessibility of Counselling Services in Polytechnics, With Reference To Bulawayo Polytechnic

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ABSTRACT
This study sought to assess the accessibility of counseling services in Zimbabwean Polytechnics. Counseling services are critical in assisting students to achieve personal, social and educational development so as to make informed career choices and informed decisions (UNESCO 2009, Farrant 1991). A descriptive survey design was used. A questionnaire and face to face semi structured interview were employed to solicit data for the study. The population of the study comprised Bulawayo Polytechnic students who were in session in 2013. Random stratified sampling was done to get a sample from the population. A descriptive data analysis was used to give the data more meaning. The findings of the study revealed that Bulawayo Polytechnic students need counseling services in areas such as social, personal, educational, health and spiritual. However the students indicated that they do not know where to go when they need counseling services. The heads of divisions indicated that there are no proper counseling structures in place at the institution. The study concluded that there is no holistic counseling service at Bulawayo Polytechnic. There is need for proper counselling structures to be put in place and the counselors to be housed in conducive rooms for counseling. Students and staff should be made aware of where to get the counseling services. The researcher also recommends that counselors should not hold authoritative positions and should not sit in disciplinary hearings as this would hinder objectivity of the counseling process.

Key words: Accessibility, Counseling, Polytechnic

Study completed: October 2014
ABSTRACT
Reproductive Rights were initially officially recognised at the International Conference on Population and Development (ICPD) in Cairo in 1994. This study sought to determine the level of knowledge, attitudes and practices of students towards their Sexual and Reproductive Health Rights (SRHR). A descriptive survey design was used and random stratified sampling was done to get a sample from the population of all National Certificate, National Diploma and Higher National Diploma Bulawayo Polytechnic students. Focus group discussions were done with the first year students in Applied Art, Applied Science, Automotive and Mechanical divisions. Two questionnaires were designed and employed to gather data for the study from students and heads of divisions. A descriptive analysis using SPSS was used to give data more meaning. The study revealed that there is no policy framework on SRHR in higher education institutions and students need information and guidance on SRHR during their study duration in the institution. Due to the fact that there is no policy framework of SRHR, the knowledge levels are low among students at Bulawayo Polytechnic. Students express ambivalent attitudes due to low knowledge levels. The students indicated that at one point or the other their sexual and reproductive rights were infringed and they did not report the matter. Students are aware of their right to sexual and reproductive health but they lack skills to exercise the right. The researcher recommends that the institutions should have an SRHR policy to fight and empower both male and female students from sexual abuse.

Key words: Knowledge, Attitudes, Practices, Students, Sexual, Reproductive, Health

Study completed: June 2015
17. Bulawayo Polytechnic Lecturers’ Attitudes and Perceptions towards the Integration of ICTS in Teaching and Research

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ABSTRACT
The use of Information Communication Technologies (ICT) is growing rapidly in all sectors of the economy and Zimbabwe’s tertiary education system is not spared. The Zimbabwean Government under the Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZIMASSET) programme has made it a policy to promote the use of ICTs in education. This paper determined lecturers’ attitudes and perceptions towards the integration of ICTs in teaching and research at Bulawayo Polytechnic. 118 questionnaires were distributed to a random sample of lecturers from divisions. It was determined that many lecturers have ICT tools but are not utilising them for teaching and research. Factors such as lack of knowledge and skills on how to integrate ICTs in teaching and research, inadequate training in using ICTs tools, negative attitudes and perceptions, limited internet access and other priorities affects the use of ICTs. Findings showed that gender has no effect on lecturers’ attitudes and perceptions towards integration of ICT into teaching and research in this survey. Recommendations focused on training of lecturers, making regular follow-ups to reinforce skills, encouraging lecturers to develop positive attitudes, providing them with all necessary resources to support ICT use, increase of internet access and introducing an E-learning system.

Key words: ICT integration, Perceptions, Attitudes.

Study completed: May 2015
18. Knowledge, Attitudes and Perceptions of Staff and Students towards the Health and Life Skills Subject: A Case of Automotive Engineering Department at Bulawayo Polytechnic, Bulawayo Zimbabwe

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ABSTRACT

Globally, 35.3 million people were living with HIV/AIDS at the end of 2012 and estimated 6.0 million of those are from Southern Africa. An estimated 0.9% of people between the ages 15-49 years worldwide are living with HIV/AIDS, although the burden of epidemic continues to vary considerably between countries and regions. Sub-Saharan Africa remains the most severely affected with nearly one in every 20 adults (5.39%) living with HIV/AIDS and accounting for 71% of the people living with HIV/AIDS worldwide. Educating for health is an important component of any education and public health programme. It protects young people against threats both behavioural and environmental, and complements and supports policy, services, and environmental change. This paper seeks to establish the knowledge, attitudes and perception of staff and students towards health and life skills education. Data was collected using questionnaires during the period February to June 2014 at Bulawayo Polytechnic. It was revealed that both students and lecturers have knowledge about Health and life skills. The staff members perceived health and life skills better than the students. Both lecturers and students have a positive attitude towards health and life skills. The students failed to realise the benefits of the subject beyond the classroom. Recommendations include conducting regular workshops and counselling sessions.

Key words: Knowledge, Attitudes, Perceptions, Health, Life skills, Polytechnic

Study completed: May 2014

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ABSTRACT

The paper investigated the role of National Studies in promoting Ubuntu/Unhu at Bulawayo Polytechnic. Data was collected from students and lecturers using questionnaires that were administered across the eight divisions/departments in the institution. The study found that National Studies plays an important role of moulding and refocusing Zimbabwean citizens in a desire to enable them to retain and cherish patriotism, self-discipline, sovereignty and contribute to the development of the country. Thus the National Studies as a subject has succeeded in producing Zimbabwean citizens or college graduates with a high level of knowledge and commitment to contribute to the development of the country by exercising, patriotism, professionalism good behaviour, and a commitment to national development. These are the premises on which the concept of Ubuntu/Unhu is based. The study also found that while National Studies greatly contributes to the adoption of Ubuntu principles, some of these Ubuntu elements are a result of upbringing and socialisation such as religious teachings. It was also found that some students only did the subject in order to be awarded their certificates. Recommendations focused on reviewing the National Studies syllabus so that it incorporates more Ubuntu/Unhu elements and also to have the subject studied in phases to keep on building Ubuntu/Unhu among students.

Key words: National Studies, Ubuntu/Unhu.

Study completed: February 2015
20. Factors Affecting Participation of Female Staff in Research Activities at Bulawayo Polytechnic

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ABSTRACT
Concern has been expressed by people in higher institutions of learning about the low number of women participating in research activities (Hill, 2010). It therefore became important to determine why there is low participation of female staff in research activities at the institution. Data was collected from female staff at Bulawayo Polytechnic in 2014 using questionnaires. The qualitative data was analysed using content analysis. The quantitative data was analysed using SPSS. The findings from the study revealed that the female staffs were failing to participate fully in research activities. Several factors at personal, institutional and societal levels were identified as barriers. At personal level, factors such as lack of encouragement, inferiority complex, fear of failure and other priorities hindered females from taking part in research. At institutional level, extreme work schedules and lack of support from management was deterring them. In addition, societal general beliefs about women’s role in the home leave little time for research. The researchers concluded that for females to fully participate in research, some of these barriers must be removed. The respondents suggested that the institution encourages and motivates females to participate, reduce workloads and provide training in research skill

Key words: Participation, research activities, females, polytechnic

Study completed: May 2015
21. The HIV And Aids Community Home Based Care Programme And Its Gender Implications. The Case of Entumbane Community

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ABSTRACT

Bulawayo is at the heart of AIDS pandemic, with HIV prevalence figures consistently higher than other provinces in Zimbabwe, currently standing at 11.6%. The purpose of this study was to explore and discuss gender discrepancies in HIV and AIDS community home based care programme in Entumbane’ CHBC in Bulawayo. The study discussed the experiences of PLWHA who are on CHBC. In-depth interviews and focus group discussions were utilized to collect information from knowledgeable individuals regarding their own and other people’s experiences, who are beneficiaries of Entumbane CHBC. A purposive sample of ninety participants from Entumbane community was purposefully selected for the study. All participants are beneficiaries of community home based care and are part of the Entumbane community. These individuals were identified for their potential to elicit valuable information since they are beneficiaries of the programme. The review literature gives some detailed analytical views on the prevalence of the pandemic and the gender discrepancies in the CHBC. The aspect of CHBC is discussed, for the role it is playing as well as the contribution it is making, albeit, in a limited manner because of resources, expertise and support from formal authority structures. In presentation, analysis and interpretations of data it is clear picture that reflects gender discrepancies in the Entumbane CHBC. The big challenge of gender imbalance in CHBC has to be squarely addressed. The fact that care giving is dominated by women demonstrates the process of gender imbalance, inequality and inequity. Conclusions were made that women and girls are at the highest risk as they bear the burden of care. It was therefore recommended that the government and its stakeholders should develop gender equality and women’s social, economic status through promotion of education, provision of loans and provisions of gender sensitive trainings.

Key Words: Community Home Based Care, Gender, Implications

Study Completed: May 2015
ABSTRACT
The study determined Bulawayo Polytechnic' staff knowledge and beliefs about cervical cancer. It also assessed men’s willingness to encourage their partners and female relatives to get screened for cervical cancer. 100 questionnaires were administered to the staff at the institution and cross tabulations showed that men above the age of 40 are more knowledgeable about reproductive health issues. Results for women show that in general women in the age range of 30-40 were more knowledgeable about cervical cancer. It was recommended that awareness efforts should be centred on males as they had less knowledge of the risk factors.

Key words: Knowledge, Cervical cancer, Reproductive health, Awareness, Risk factors

Study completed: June 2015
ABSTRACT
This article is premised on Zimbabwe’s false start to its socioeconomic transition process in line with socialist principles espoused during the liberation struggle. The inherited capitalist system had to be maintained and modified to ensure continuity and in the spirit of reconciliation. Socializing the means of production against the backdrop of an economy that still remained essentially capitalist was untenable. The resultant mixed economy compromised the revolutionary promises made to the blacks as to kept them wondering whether there was ever that commitment to socialist transformation in the first place. This ambiguity characterized Zimbabwe’s socioeconomic endeavours especially during periods of drought and ESAP. This research critiques the government’s marriage to socialism on a repulsive of conditions capitalist. It focuses on ideological pragmatism as a theoretical framework by government around which to resolve the inherent contradictions without necessarily losing its grip on people. The introduction of liberal reforms is viewed as admission of the reality that socialism and capitalism could not co-exist. It makes an explanatory case study of the gendered nature of urban economic differentiation and explores the various survival strategies that the poor black women urbanites adopted to adapt to perennial harsh economic realities. It finally recommends the promulgation of pro-women policy regulations for urban women that are less ideological and more developmental.

Expected date of completion 15 November 2015
ABSTRACT

Male circumcision devices have the potential to accelerate voluntary medical male circumcision roll-out, with PrePex being one promising device. Here, we present findings on safety and acceptability from active surveillance of the implementation of PrePex among 1,000 adult males circumcised in Zimbabwe. A total of 2,156 men aged ≥18 were circumcised across the six PrePex active surveillance sites. Of these, 1,000 (46.4%) were circumcised using PrePex. Among them, four (0.4%) self-removals which required surgery (severe AEs), were observed. Six (0.6%) removals by providers (moderate AEs) did not require surgery. A further 280 (28%) AEs were mild or moderate pain during device removal. There were also 12 (1.2%) moderate AEs unrelated to pain. All AEs resolved without sequelae. There was high adherence to follow-up appointments, with 97.7% of clients attending the scheduled day 7 visits. Acceptability of PrePex was high among survey participants, 93% indicated willingness to recommend the device to peers. 95.8% of respondents reported experiencing pain when the device was being removed. Additionally, 85.2% reported experiencing odour whilst wearing the device or during removal. Active surveillance of the first 1,000 adult men circumcised using PrePex suggests that the device is both safe and acceptable when used in routine service delivery. The on-going active surveillance plus acceptability and satisfaction study with adolescent men aged 13-17 will explore these issues among this group of men and provide additional insights.

Key words: PrePex, male circumcision, safety, acceptability, Zimbabwe

Date when the study is expected to be completed: 2016
Chinhoyi University of Technology

25. Feasible Solutions To Electronic Waste Management (And Disposal Methods) That Support Green Computing In Zimbabwe

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ABSTRACT

Over the recent past, the global market of electrical and electronic equipment (EEE) has grown exponentially, while the lifespan of these products has become increasingly shorter. More of these products are ending up in rubbish dumps and recycling centres, posing a new challenge to policy makers with a new challenge of electronic waste management. Electronic waste or e-waste consists of obsolete electrical and electronic equipment (EEE). Obsolete EEE includes computers, televisions, mobile phones, printers and electronic goods, such as refrigerators and stoves. In the past, China and India had been the ‘dumping sites’ for such discarded global e-waste. However, since 2005 several studies have exposed illegal exporting of e-waste from developed countries to African countries. Additional levels of domestically produced e-waste are rising across Africa as well, a result of increased electronic goods consumption stemming from, among other factors, growing rates of disposable incomes. E-waste presents serious environmental and health challenges for the countries left dealing with it, due to both its volume and toxicity. To date, global regional and national policy and regulatory responses have predominantly focused on banning trans-boundary shipments of e-waste. These responses have been weakly enforced, and have been largely ineffective in both the sending and receiving countries. Alternative solutions include recycling technology transfer and increased manufacturer responsibility, although neither has been significantly effective to date. The current potential for environmental and health risks associated with e-waste to rise across Africa is high, and thus presents a serious challenge. The purpose of this paper is to provide a review of the e-waste problem and to put forward estimate techniques and solutions to e-waste management that are in line with green computing.

Key words: E-Waste management, green computing
26. Sequencing and Assembly of the Water Hyacinth Genome and Transcriptome: A Molecular Understanding of Water Hyacinth Physiology

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ABSTRACT

Water hyacinth (Eichhornia crassipes) is a major freshwater perennial, invasive weed native to South America and in most of the frost-free regions of the world. In suitable environmental conditions, it has spread with phenomenal rapidity to form vast monotypic stands in water bodies, monopolizing resources, resulting in economic, environmental and social adverse impacts on human activities and biodiversity. Currently, there is no single fix-all prevention and control solution to this endemic, often only an integrated management strategy, inclusive of cultural, mechanical, chemical and biological control strategies, which have remained limited in effectiveness. The unavailability of water hyacinth genomic information in public databases limits our scope of understanding of the genetic variability, growth and developmental physiology of water hyacinth to the few expression sequence tags (ESTs) currently publicly available. It is the aim of this study to review, sequence and assembly the water hyacinth genome and transcriptome, in order to shed more light on water hyacinth growth and developmental physiology at a molecular level. Genomics offers many alternative points for water hyacinth control at molecular level, to the current many attempts in controlling and understanding the invasiveness of water hyacinth.

Key words: Genomics, ESTs, water hyacinth control, growth and development

Date when the study will be completed

The project was structured such that the initial stages review the status of water hyacinth genomics pointing to the potential gaps in our molecular understanding of its development. This phase should be done by August 2016. The second and third phases then look deeper into the genomics of water hyacinth filling up the existing gaps and proposing molecular control options. The two last phases will be completed in 2018.
ABSTRACT

The purpose of this paper is to examine reclaiming Ubuntu philosophy as a kernel of Chinhoyi core values, leads to better institutional vision, mission and strategies. The study explores how values of Ubuntu are linked to service excellence at CUT. We argue that reclaiming and praxis of Ubuntu philosophy bridges service delivery performance gap. Design/methodology/approach – Simple random sampling method focusing on Ubuntu and client service charter framework (CSCF) is used. Having reviewed relevant literature, the study employs self-completing questionnaires and interviews. A qualitative methodology was used. Data was analysed using SPSS and content analysis. Findings – Basing on key variables embodied in Ubuntu philosophy, the study shows that a CSCF for CUT was non-existent, thereby creating service performance delivery gap. Research limitations – This study is exploratory, however, the findings could be generalised within African context as Ubuntu is an African ethic.

Key words: Ubuntu, philosophy, vision, mission, strategy, service – charter

28. Corporate Governance and Ethical Behaviour: The Case of the Zimbabwe Broadcasting Corporation

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ABSTRACT
This study sought to evaluate the impact of corporate governance and unethical behaviour on the performance of state corporations in Zimbabwe. A case study approach was taken involving the Zimbabwe Broadcasting Corporation, which is the sole broadcaster in the country. Questionnaires and face to face interviews were used to gather data from Senior Government Officials and the general public. The study found that top management, and the Board were corrupt. Procurement of goods and services were done without following proper tender procedures, thereby depriving the Corporation of millions of dollars. There was no efficiency and effectiveness in the way service was being delivered. There was lack of accountability and transparency in the way business was being done. It was reported that employees went for over seven months without salaries yet top management and the Board paid themselves handsomely. There was no relationship between the Chief Executive Officer’s salary and performance of the organisation. Nepotism and intimidation were also reported to be high and this affected morale among employees and service delivery to the general public remained poor. It was noted that bad corporate governance and unethical behaviour had serious negative implications on both organisational and employees’ performance. The study concluded that there were serious mis-governance issues in ZBC which needed urgent redress. The study recommended that boards should monitor the activities of Parastatals and make sure that they act to the best interest of all their stakeholders, make sure that salaries are performance related and that they adhere to best corporate practices.

Key words: corporate governance, corruption, ethical behaviour, integrity, accountability

ABSTRACT
Drawing from strategic management, insights from stakeholder theories and practising management experiences, the researchers empirically analyse that strategy is an organisation’s formula to win in corporate war, elevating the organisation to a higher ground through use of tools in Zimbabwean tourism organisations. This article shows that strength, weaknesses, opportunities and challenges (SWOC) analysis, allows the organisation to assess the fit of its current strategy to its changing environment and help to capitalise on internal and external factors to achieve better performance. An application of the Four Arena Analysis, pitching one organisation to another, pinpointed performance differentials. The New 7-Ss Analysis, reinforced critical issues determined from SWOC, Stakeholder Analyses and Stakeholder Prioritisation Grid, enabling the cross examination of performance concerns coming out through the employment of these tools. The 7S Framework was then instituted to inform on broad strategy to be implemented for each of the critical areas in the organisation. The balanced scorecard harnessed the full brainpower, knowledge and experience available as drawn from the sequenced tools into specific strategic focus areas. Results obtained indicated that business is war at best and tools can reposition an organisation to a transformative winning stance. Qualitative approach was employed in this study. An evaluative research design on developed case studies was chosen because it was aimed at making judgements about performance outcome as a result of adopting business as war, with distinct live tools that can be practically, sequentially employed to stimulate performance through strategizing to a higher ground.

Key words: strategy, tools, higher ground, performance, war

30. Ubuntu-Praxis: Re-Modelling the Balanced Scorecard Model at a University, an Afrocentric Perspective

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Mike Nyamazana Sikwila, Chinhoyi University of Technology

ABSTRACT
The authors design the innovation and learning perspective of the Balanced Scorecard (BSC) of “Ubuntu and client service charter nexus.” This article borrows and advances the research carried out by Khomba, Vermaak and Gouws (2011). The point of departure is on praxis of Ubuntu/Unhu as a holistic approach in the re-modelling of the BSC thereby integrating and enhancing performance management approach. Mixed methods were followed. Data collection instruments used included questionnaires and in-depth interviews held with key informants. Exploratory factor analysis and correlation analysis using SPSS Version 16.0 were employed and the authors identified four correlated principal- components that could constitute an Afrocentric perspective of the BSC model, namely: Africanisation values for general issues surrounding ubuntu/unhu values and client-service perspective of the corporate performance attribute; Learning values being traits focusing on values pertaining to employee innovation and learning, internalising ubuntu/unhu principle for better corporate productivity and performance; Customer values focusing on operationalizing ubuntu/unhu philosophy in the creation and promotion of customer care and services; and wealth creation, innovation and technology values clarifying competitive advantages gained from motivated workforce exuding Ubuntu/Unhu, and their contributions through knowledge, skills and abilities. Results indicated that the four components modelled into the innovation and learning, permeating into three other perspectives of the BSC, adds value to improved productivity and performance and it would be perhaps, one of CUT’s options of ideal approach. This study is significant to African institutions and stakeholders in performance management.

Key words: Ubuntu/unhu, Performance management, Balanced Scorecard, Values, Culture, Indigenous knowledge systems, Institution/organisation


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31. Exploring Modern Technology Adoption in Zimbabwe’s Beauty Therapy Industry

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Forbes Kabote, Chinhoyi University of Technology

ABSTRACT

Background: New technology adoption has been recognised as vital in the stability and growth of a country’s economy. Globally the beauty therapy industry has embraced technological advances. In Zimbabwe basic beauty therapy that does not use modern complex technology is prevalent.

Objectives:
1. To establish technologies being used in Zimbabwe’s beauty therapy industry.
2. To examine the perceptions of beauty therapists on new technologies in the beauty therapy industry.
3. To explore strategies that may be adopted to improve the adoption of new technologies in Zimbabwe’s beauty therapy industry.

Methods:
Using purposive and convenient sampling, thirty one beauty therapist experts were identified. One hour long in-depth interviews were held and recorded.

Results:
Participants viewed modern technology adoption as critical for the industry. Non-accessibility of modern technologies, lack of supportive government policies; non-existence of a beauty therapy association, lack of proper beauty therapy education and under research were found to hinder modern technology adoption.

Conclusions:
The industry is ready to adopt modern technology and there is need to realign the macro environment to make it supportive for the adoption to be real.

Key Words: Beauty Therapy, Technology Adoption, Cosmetology, Dermatology, Zimbabwe

32. Tourism Development and Social Carrying Capacity of Zimbabwe’s Victoria Falls Rural Peripheries

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Simbarashe Chinofamba, Chinhoyi University of Technology

ABSTRACT
Tourism development induces changes on the social character of a destination. Such changes affect the sustainable development of the destination and the relationship between hosts and tourists. The purpose of this study was to explore how tourism development is affecting the social carrying capacity of Zimbabwe’s Victoria Falls Rural Peripheries. The study is premised on the Social Exchange Theory. Qualitative data was collected from twenty nine villagers and forty two tourists using a questionnaire in 2013. The results showed that 80% (n=30) of the villagers are of the opinion that the social carrying capacity of the area has been surpassed whilst 90% (n=42) tourists still believe that there is more room for tourism development in this area. It was therefore concluded that there is a mismatch between the perceptions of the local villagers and tourists regarding the social carrying capacity of Victoria Falls rural peripheries, indicative of the long standing debate around when sustainable development is sustainable and in whose opinion. As a policy recommendation, it is high time the relevant authorities involve local people in tourism development issues thereby helping in creating a moment of truth that is socially sustainable for both tourists and host communities.

Key Words  Tourism development, Social Carrying Capacity, Victoria Falls, Host Communities, Rural Areas, Host and tourist safety, Zimbabwe

33. Employee Perceptions of HIV & AIDS on the Hospitality Industry in Zimbabwe

Forbes Kabote, Freddy Hamadziripi, Sebastian Vengesayi, Felisitas Chimutengiza, Theresa T Makoni,

Chinhoyi University of Technology

ABSTRACT

HIV & AIDS prevalence is causing lots of deaths in the hospitality industry affecting the most productive population. The study was conducted to explore employee perceptions of HIV & AIDS on the hospitality industry. Using qualitative research philosophy data was collected using semi-structured questionnaires from employees at selected hotel establishments. The data was analysed thematically. Two critical themes emerged from the study. Firstly HIV & AIDS was being treated as a taboo subject and secondly; there are no clear organizational policies on HIV & AIDS. The researchers concluded that hospitality organizations are still ignorant of devastating existence of HIV & AIDS. Three recommendations were made from the study. Hospitality establishments should embrace the fact that HIV & AIDS exist, Organizations should work with employees to produce workable policies and that organizations should take heed of government efforts in tackling HIV & AIDS and do their part in this international cause.

Key Words HIV & AIDS, Hospitality Industry, HIV positive employees

34. The Effects of Dollarization on Human Resources in the Hospitality Industry in Zimbabwe

_forbes kabote, sebastian vengesayi, patrick walter mamimine, rumbidzai mataruse._

_chinhoyi university of technology, zimbabwe._

**Abstract**

The study investigated effects of dollarization on Hospitality Industry’s Human Resources. A qualitative study was done in hotels located at one of Zimbabwe’s renowned tourist resort (Nyanga). Semi structured questionnaires were used to collect data and thematic data analysis adopted. Major issues to emerge from the study were improved employee performance, decreased staff turnover, high staff morale and improved employee benefits. It was concluded that apart from the disadvantage of the country’s loss of monetary and fiscal sovereignty, dollarization positively affected the hospitality industry’s human resources. It is therefore recommended that dollarization should continue in the Zimbabwean economy for continued benefits of employees and their families until such a time when introduction of local currency does not in any way erode the gains realised as a result of dollarization.

**Key Words:** Dollarization, Human Resources, Hospitality Industry, Zimbabwe,

_kabote, f., vengesayi, s., mamimine, p., mataruse, r., (2014). the effects of dollarization on human resources in the hospitality industry in zimbabwe. iosr journal of business and management (iosr-jbm) 16(6. ver. iii), pp. 65-71_
ABSTRACT
Zimbabwe went through an unprecedented political and economic crisis between 1999 and 2009 which had severe effects on its tourism and other productive sectors. The main objective of this study was to identify the critical issues Zimbabwe needed to address to rebrand itself as a competitive tourist destination since the subsiding of the crisis in March 2009. Data to fulfil the study’s objective was gathered through a questionnaire administered to employees of the country’s national tourism organisation, the Zimbabwe Tourism Authority. Six critical issues that influence nation rebranding were extracted from the data using principal component analysis. The tentative managerial implication of the paper was that Zimbabwe needed to consider the six key issues in its tourism destination rebranding effort. The academic implication of the study was that the issues need to be further empirically tested with data from representative samples of respondents drawn from a wide range of stakeholders in tourism destination marketing.

Key Words: Destination rebranding, national tourism organisation, factor analysis, Zimbabwe

ABSTRACT
Several studies carried out by different researchers on turnaround strategies for tourism have not explored the perceptions of stakeholders on these strategies as they are employed by national tourism organisations (NTOs). Given the strong relationship between positive perceptions and socio-economic viability in areas of high tourism dependence, it is considered prudent to ensure that all stakeholders are included in this concerned partnership (Bierman 2003). If lack of knowledge of stakeholder perceptions on NTO turnaround strategies is not addressed, public-private partnerships will remain very difficult to harness and national tourism organizations such as the Zimbabwe Tourism Authority (ZTA) will continue to fight lone battles. The study therefore sought to address the question: how do Zimbabwe’s tourism and hospitality stakeholders perceive the strategies being employed by the ZTA in turning around Zimbabwe’s tourism industry. The study adopted a qualitative approach. Data was collected during the Sanganai/Hlanganani World Travel and Tourism Africa Fair 2013. It was generally discovered that the ZTA does not consult widely when coming up with its strategies. The study also found out that ZTA’s strategies are quite visible in the market as they try hard to turn around the fortunes of Zimbabwe’s tourism. However, most of the strategies are not effective as they lack stakeholder support; therefore, the study recommended that the ZTA engages its stakeholders more widely.

Key Words: stakeholders, stakeholder perceptions, turnaround strategies, Zimbabwe Tourism Authority

ABSTRACT

Only 8 out of over 110 registered hotels in Zimbabwe are ISO certified. The main purpose of this study was to explore the perceptions that hoteliers in Zimbabwe have in relation to I.S.O certification. The specific objectives of the study were; to establish hotelier’s perceptions of ISO certification in Zimbabwe, to establish reasons for the low uptake of I.S.O certification in Zimbabwe’s hotel sector and to develop strategies for enhanced uptake of I.S.O certification in Zimbabwe’s hotel sector. A largely qualitative research design was used and a judgmental sample of 54 respondents, comprising of hotel marketing managers, was incorporated in this study. Generally, the findings of the study seem to suggest that I.S.O certification is highly applicable and functional in Zimbabwe’s hotel sector. The benefits of I.S.O certification in other economic sectors play a very crucial role in shaping the perceptions hoteliers have in relation with the scheme. As a result of the findings of the study, hoteliers are recommended to fully embrace I.S.O certification. However, there is further need to carry out studies to ascertain the impact of I.S.O certification on hotel businesses as most of the benefits seem to be adopted from other industrial sectors such as manufacturing.

Key Words: ISO certification, functionality, applicability, hospitality sector, hoteliers

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Ednah Tendani, Belvedere Teacher’s College
Nelson Zengeni, Chinhoyi University of Technology,

ABSTRACT
The Zimbabwe hospitality environment is recognised for its importance to Zimbabwe economy. It is a booming industry, yet there is very little research that focuses on the specific issues affecting those working in the kitchen. Based on employees perspective this case study looks at the issue of the absence of females in the Executive Chef Position. The case study focuses on the kitchen department of R.T.G hotels. The lack of research into the kitchen, and more specifically the Hospitality in Zimbabwe environment is perplexing because it is predominately female, yet at Executive Chef Levels these females are not equally represented. Purposeful sampling was used in coming up with a sample of thirty respondents. Data from this study was analysed using tables, bar graphs, pie charts and the findings were categorised under themes according to the major areas of investigation and followed by discussion. The findings revealed that marital status (work family conflict), lack of experience, negative attitude of females, and the harsh conditions in the kitchen are the major contributing variables to the absence of females in the Executive Chef Position in the commercial kitchens. The research recommended that females should market their selves by being employed in other sections other than the pastry section. The research recommended that chefs must be employed and promoted by merit, equal salaries /wages and opportunities to kitchen job in any position in Hospitality Industry irrespective of sex. There is need for more research in the kitchen on the nature and conditions of the kitchen job hence the National Gender Policy Implementers must not generalised with other industries.

Key Words: Absent, Female chef, executive chef, position, and kitchen

ABSTRACT:
The main aim of this paper is to explore stakeholder involvement in the development of a brand as well as in the rebranding exercise in order to produce high brand value. Most researchers concur that stakeholders play an imperative role in destination branding as they deal directly with the tourists. The tourism industry as a whole is characterized by intangible services which require proper management. The intangibility of these tourism products and services determine a destination’s possibility of being chosen by potential tourists. A positive image will attract tourists, allow revisits as well as attracts new customers be it via marketing or word-of-mouth as well as enhancing customer satisfaction. Based on literature review, a conceptual model on attaining high brand value is proposed. Brand image; brand awareness as well as brand loyalty in relation to stakeholder influence were reviewed since they have an effect on brand value. The paper observes the importance of stakeholders in destination rebranding.

Key Words: Branding, Rebranding, destination, stakeholders, brand

ABSTRACT
The paper conceptualizes a stakeholder model that reflects their involvement for tourism development. The model integrates key sequential concepts such as stakeholder research, stakeholder strategy formulation and stakeholder implementation. Stakeholder research will be inevitable so as to unearth the true state of affairs as well as unravelling the existing challenges within the tourism industry. Strategy formulation of stakeholders will involve collaboration and consultations among the various key stakeholders to craft measures on how best tourism development can be achieved; measures may include capacity building or establishing a communication platform. Implementation involves putting all the strategies into action and involving all stakeholders. The conceptual model results from the syntheses of literature for successful stakeholder processes and developing collective commitment and capacity to turn ideas and plans into action. Both theoretical and empirical works were consulted in structuring the model and specification of its various concepts.

Key Words: Stakeholder, Stakeholder involvement. Collaboration, Tourism, Tourism Development

41. Conditions for Customer Relationship Management (CRM) success in Zimbabwe’s Hospitality sector.

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ABSTRACT

We investigated the conditions necessary for CRM success in a Hospitality sector that is failing to retain and attract clients. The main purpose of this study was to establish the potential of CRM in aiding customer retention in Zimbabwe’s Hospitality sector that has been marred by economic instability and a decade of political turmoil. Our approach was based on a mixed approach of a quantitative and qualitative dimension. Results indicate that operational and technological conditions in place for CRM in Zimbabwe’s hospitality sector are somewhat ineffective potentially due to limited resources for technological advancement and reluctant management systems to fully practice CRM. The conclusions thereof emphasise on the need to promote technological integration in the business of the hospitality sector and promote a CRM strategy that take cognisance of customer needs as a drive towards better business performance in Zimbabwe’s Hospitality sector.

Key Words: CRM, CRM success, relationship marketing, service conditions, customer retention.

42. Community perceptions of wildlife conservation and tourism: A case study of communities adjacent to four protected areas in Zimbabwe

Chiedza Ngonidzashe Mutanga, Sebastian Vengesayi, Edson Gandiwa, and Never Muboko

Chinhoyi University of Technology

ABSTRACT

The objectives of this study were: (1) to determine community perceptions of wildlife conservation and tourism, and (2) to establish socio-demographic factors that influence community perceptions of wildlife conservation and tourism. Using closed-ended questionnaires, we collected data from July 2013 to February 2014 in four protected areas (PAs) and adjacent communities in Zimbabwe, i.e., Umfurudzi Park, Gonarezhou National Park, Matusadona National Park and Cawston Ranch. A total of 938 responded to the survey. The community in Gonarezhou had neutral perceptions of wildlife conservation, while those in Umfurudzi, Matusadona, and Cawston Ranch had positive perceptions of wildlife conservation. All four communities had negative perceptions of tourism. There were variable correlations between socio-demographic factors and community perceptions of wildlife conservation and tourism among the different study communities. We concluded that the PAs in question have not fully involved the communities in PA management and that benefits from natural resources are not fairly shared among stakeholders, as explained by the different perceptions communities had on wildlife conservation and tourism. We recommend that conservation agencies should: (i) nurture positive perceptions and address the possible determinants of negative perceptions by the communities, (ii) enhance community involvement and benefits from tourism, and (iii) consider community heterogeneity in conservation planning.

Key Words: conservation, community heterogeneity, perceptions, socio-demographic factors, tourism

43. Towards harmonious conservation relationships: A framework for understanding protected area staff-local community relationships in developing countries

Chiedza Ngonidzashe Mutanga, Sebastian Vengesayi, Never Muboko, Edson Gandiya

Chinhoyi University of Technology

ABSTRACT

This paper conceptualises a Framework for assessing protected area (PA)–community relationships and is premised on the view that positive PA–community relationships enhance conservation. A meta-synthesis of existing academic literature with a qualitative orientation was used to review the PA staff-community relationships, and data were analysed using an inductive qualitative approach. From a review of 105 published documents focusing on wildlife conservation, community involvement and PA–community relationships, it emerged that relationships are mostly influenced by attitudes. With the case of PA–community relationships, the question that arises is ‘whose attitude’? The paper proposes that both PA staff attitudes and community attitudes play an important role in shaping these relationships. Based on these findings, we propose a PA–community relationship framework that illuminates the human–wildlife interface as critical space in shaping conservation attitudes. In particular, four major factors affecting PA staff-community relationships were identified: (i) history of creation of the PAs focusing on forced relocation, and the fences and fines approach; (ii) benefits and costs associated with living closer to PAs; (iii) socio-demographic factors in which the influences of sex, age, level of education, number of years stayed in the village, experience accrued from working in PAs, household size, number of livestock, sources of income, and level of income; and (iv) community involvement in conservation-related developmental projects. We conclude that enhanced PA–community relationships promote wildlife conservation through participatory approaches and collaboration between PA staff and communities. We recommend for continued assessment and monitoring of PA staff and community relationships in order to allow for sustainable conservation especially in developing countries.

Key Words: Attitudes, Community Factors, Protected area, Tourism, Wildlife conservation

ABSTRACT
International borders greatly influence tourism development. In 2012 and 2013, a decline in tourists to Zimbabwe from South Africa was partially attributed to tourist border facilitation issues. It is against this background that this study sought to establish the nature of challenges faced by tourists when using the Beitbridge border post (Zimbabwean side). Questionnaire responses were thematically analysed and the study concluded that border administrative management related issues are a major barrier to tourism. Key among the study’s recommendations is that the depressed tourists’ border experiences obtaining at Beitbridge border post among other constraints have to be addressed as a matter of urgency. This will enhance Zimbabwe’s accessibility, tourist satisfaction and the image of the country as a destination. The paper further identifies several destination managerial implications and future research priorities.

Key Words: Tourist border facilitation; Beitbridge border post; Zimbabwe
ABSTRACT
The delivery of Memorable Tourism Experience has emerged to be one of the critical catalysts for destination competitiveness and sustainability. While a notable growth in boat cruise activities is being recorded globally there is an ironical silence by scholars on the subject; with minimal research having been conducted so far. Using a qualitative methodological slant, this study therefore sought to explore the determinants of Memorable Tourism Experience in the boating sector. The study concluded that provision of unique local food, cultural based entertainment, opportunity for tourist’s social interactions, beautiful scenery, encountering wild animals, professionalism of crew members, opportunities for boaters’ group involvement and refreshment are important determinants of Memorable Tourism Experiences in the boating sector. Boat operators should thus strive to facilitate the development of Memorable Boating Experiences through an assortment of the above stated eight (8) determinants.

Key Words: Memorable Tourism Experience, boat cruise, Kariba, Zimbabwe

46. Hotel Sales Decline and Opportunities for a Turnaround: The Case of a Selected Hotel Chain in Swaziland (2008–2010)

Farayi Phillip Kanokanga, Sebastian Vengesayi, Patricia Mumbengegwi, Cloetilda Kazembe, Pauline Karigambe

School of Hospitality and Tourism, Chinhoyi University of Technology, Zimbabwe

ABSTRACT
The study sought to explore the causes of sales decline and possibilities of a turnaround at some selected hotel chain in Swaziland between July 2008 and December 2010. In this study 5 senior managers, 12 middle level managers, 5 junior managers and 2 ordinary employees were used as research subjects. Fifty per cent of them were male and 42 per cent female. The study sought to facilitate the organisation to appreciate and fix the causes of sales decline; the hotels’ personnel to be better motivated, and hotel guests to enjoy improved customer care. The study showed that stiff competition was the main cause of sales decline. Economic hardships, and low personnel motivation also played a part. The study recommended that staff motivation be taken more seriously. The use of the world’s best practices was recommended as well as further research on casino operations.

Key Words: competition, hotel, opportunities, sales decline, turnaround

ABSTRACT
The problem is that more often than not tourism is perceived as an event rather than a process. Another error of perception is that the destination is seen as a pin-point area rather than an environment that can hardly be precisely defined. The Zimbabwe Tourism Authority (ZTA’s) tourism and hospitality statistics derive from the country’s renowned destinations. Small towns are omitted. Tourism and hospitality statistics of some fairly big towns are added to those of anchor attractions. Unless the problem is resolved, the tourism potential of small towns will not be fully tapped. The paper investigated opportunities for domestic tourism development in the small towns of Chinhoyi and Karoi. It is crucial to view tourism as a much broader phenomenon occurring in a broader context. It does not seem prudent to allocate resources to much –publicised destinations ignoring what one could term the tourism corridor. A survey of 55 randomly selected domestic tourists in the two towns revealed that holiday experiences of the majority (51%) of respondents would improve through the provision of historical tourism. Forty three per cent required events and a variety of entertainment. Thirty per cent needed nature -based tourism. Family - oriented facilities were also proposed. The study recommended that route tourism be a subject of scholarly inquiry in Zimbabwean tourism.

Key Words: anchor attractions, domestic tourism development, small towns, tourism corridor, ‘tourising

School Of Wildlife, Ecology and Conservation

48. Vegetation Dynamics Prior To Wildlife Reintroductions in Southern Umfurudzi Park, Zimbabwe


Chinhoyi University of Technology

ABSTRACT
Vegetation assessments are critical in the status and success of reintroduction programs and are an important aspect in ecological restoration. Vegetation structure and composition influences the suitability and availability of unique habitats for different wildlife species. The objectives of this study were to (1) establish the vegetation structure and composition, and (2) determine the soil-vegetation associations in southern Umfurudzi Park, Zimbabwe, prior to the reintroduction of wildlife species. Using a stratified random design, 15 rectangular plots from three strata were assessed in April and May 2012. A total of 23 woody plants from 58 tree and 68 shrub families as well as 30 grass species were recorded. Tree basal area, canopy cover, tree density, tree and grass species diversity, and tree height for the riverine strata were significantly different from the miombo and vlei strata. The influence of soil properties on the occurrence and diversity of woody and grass species was evident across the three strata. Long-term changes in the vegetation dynamics and primary productivity in southern Umfurudzi Park due to the reintroduced mega-herbivores is recommended for the success of the restoration program.

Key Words: restoration ecology, miombo ecosystem, herbivores, species diversity, vegetation structure.

49. Post-Release Monitoring Of Diet Profile and Diet Quality of Reintroduced African Buffalo (Syncerus Caffer) In Umfurudzi Park, Zimbabwe


Chinhoyi University of Technology

ABSTRACT
Post-release monitoring of wildlife is essential to the success of ecological restoration initiatives. Translocation of wildlife to new ecosystems is associated with changes in diet profiles of individuals and animal performance. Recently, efforts have been made to resuscitate Umfurudzi Park through wildlife reintroductions and active ecosystem management. We assessed the diet profile and diet quality of African buffalo (Syncerus caffer) between 2011 and 2012. A total of 42 grass species constituted the diet spectrum of buffalo. Heteropogon contortus, Eragrostis racemosa, Steroechlaena tenuifolia and Themeda triandra contributed significantly to buffalo diet during the study period. Although a wide spectrum of grass species was selected in the wet season, the diversity of grass species selected was not significantly different among the seasons. Grass species crude protein deteriorated from 4.5% in the wet season to 3.5% in the dry season. Crude protein and phosphorus levels in buffalo fecal samples were within the recommended nutrient scale for southern Africa large herbivores. We concluded that feed availability and quality may not be limiting the persistence of the reintroduced buffalo. There is a need to closely monitor grass availability, dietary shifts, and forage quality over time, as well as resource partitioning with other feeding guilds.

Key Words: Habitat, herbivores, crude protein, phosphorus, biodiversity

Tropical Conservation Science Vol.7 (3): 440-456
ABSTRACT
This article reports the first attempt at a rigorous and systematic study of chemical poisoning of wildlife in Hwange National Park prompted by the 2013 cyanide poisoning of elephant. The objectives of the study were to: 1) identify the species and quantify the animals affected by cyanide poisoning, and 2) assess the opinions of people directly affected by this incident, both socially and ecologically. The assessment conducted in October 2013 included two field visits to the main sites of elephant poisoning, personal interviews with five Parks officials based at Hwange NP and three Forest Commission representatives based at Ngamo Forest Field Station, and a review of aerial survey reports. Extensive aerial survey reports and personal observation put the total elephant deaths through poisoning at 105 inside the park and 30 outside, from 40 contaminated sites. The reasons for mass poaching of elephants using cyanide were varied and included issues of poverty, disgruntlement over skewed distribution of CAMPFIRE proceeds, land contests, external influence, particularly from markets, retaliation for crop raiding and outright subversion of the law. It is important to re-enforce law-enforcement efforts in protected areas and review workforce levels in dealing with illegal hunting and trade of endangered species.

Pachyderm, (55): 92-94
51. Embracing Indigenous Knowledge Systems in the Management of Dry Land Ecosystems in the Great Limpopo Trans Frontier Conservation Area: The Case of Chibememe and Tshovani Communities, Chiredzi, Zimbabwe


Chinhoyi University of Technology

ABSTRACT

The important role indigenous knowledge systems (IKS) is described in redefining the biodiversity conservation agenda of the Chibememe and Tshovani communities in the Sangwe Communal Lands, Chiredzi, in the management of dry land ecosystems of the south eastern low veld of Zimbabwe. These communities constitute part of the Great Limpopo Trans frontier Conservation Area (GLTFCA). We explored ways in which the use of IKS communities have contributed to the conservation and sustainable utilisation of forest, water and wildlife resources in light of existing contemporary scientific value systems, policy and institutional frameworks. Participant observation, interviews with key informants and focus group discussions were employed within a case study framework. Our results revealed that IKS approaches are used in the management of dry land forest, water and wildlife resources in the Chibememe and Tshovani communities and have contributed positively to the conservation and sustainable utilisation of dry land resources. We conclude that IKS play a critical role in the management of dry land forest, water and wildlife resources at the local community level and have potential to contribute to the conservation of trans frontier conservation area resources such as in the GLTFCA, provided they are recognised, respected, preserved, protected, as well as integrated into mainstream dry land ecosystem conservation.

Biodiversity, 15(2-3): 192-202
ABSTRACT
In African Lions (Panthera leo), human imprinting was suggested as one option of pre-release training of orphaned cubs, but success of this option has rarely been explored. This study assesses the success of human imprinting on captive-bred lion cubs at Antelope Park in Gweru, Zimbabwe. Activity diversity, activity budgets and response to non-wild objects were compared in three levels of human imprinting (high, medium and low) using the focal technique. Six lion cubs were used for this study (two in each imprinting category). Data were collected during early morning, mid-morning and late afternoon sessions from October to November 2011. In the three levels of human imprinting, resting and locomotion had the largest proportion of time compared to playing, visual exploration, feeding, human interaction and hunting. Lion cubs with low imprinting displayed the most “hunting instincts” and aggressive behaviour toward humans and vehicles, compared to those with high and medium imprinting levels. High and medium imprinted cubs (9-13 months old) displayed some positive hunting instincts. Early signs of hunting instinct displayed suggest that human imprinting may be important in pre-release training of wild felids prior to reintroduction programmes.

*International Journal of Molecular Ecology and Conservation, 4(4): 1-6*
53. Impacts of Wood Poaching On Vegetation Structure and Composition in Mukuvisi Woodland, Zimbabwe

*Muboko, N., Chigumira, T., Mashapa, C., Gandiwa, E., Chibememe, G., and Muposhi, V. K*

*Chinhoyi University of Technology*

**ABSTRACT**

The study focused on the effects of wood poaching on vegetation structure and composition in Mukuvisi Woodland, Zimbabwe. Mukuvisi Woodland suffers from high illegal wood utilization pressure stemming from the need to fulfil alternative energy demands created by persistent electricity shortages and an unstable economic environment, particularly between 2000 and 2008. Due to the heterogeneity in vegetation utilisation trends, we used the stratified systematic random sampling technique, where the site was divided into two strata, central and boundary. Twelve (30 × 20 m) permanent plots were established in which species name, species diversity, height, basal area, plant status, fire evidence, number of stems and saplings were assessed in April and May 2012. A total of 968 woody plants were assessed representing 47 woody plant species. All woody vegetation variables recorded and assessed showed no significant difference (P > 0.05) between the two strata except sapling density (P = 0.022). Principal Component Analysis indicated evidence of fire impacts on vegetation structure. Illegal wood harvesting in Mukuvisi Woodland has not yet reached alarming proportions and can be contained. We recommend collaborative arrangements with key stakeholders, embracing alternative energy sources and increased environmental education and awareness campaigns.

*Journal of Environmental Protection, 5: 156-163*
School Of Engineering Sciences and Technology

54. Grewia Bicolor Seed Oil: Putative Pharmaceutical, Cosmetic and Industrial Uses.


ABSTRACT
The physicochemical characterization, seed oil content and fatty acid profile of oil extracts from Grewia bicolor seeds collected from Zimbabwe were performed using standard extraction and chromatographic techniques. The main objective was to determine the potential domestic and industrial usefulness of the G. bicolor seeds. The G. bicolor seeds yielded 4.80% of brownish-orange oil that had an acceptable odour. The seed oil consisted of saturated (20.20%), monounsaturated (25.10%) and polyunsaturated (54.41%) fatty acids. Palmitic acid (11.46%), stearic acid (5.77%), oleic acid (19.33%) and linoleic acid (54.41%) were the main fatty acids in G. bicolor seed oil. The oil had a high acid value (0.53 mg KOH/g), iodine value (39.21g I₂/100g oil) and saponification value (130.43mg KOH/g) compared to published data on nutritionally and ethnomedicinally important plant seed oils. We conclude that the G. bicolor seeds are low oil yielding, whose oil could be used as a potential source of palmitic, stearic, oleic and linoleic acids and may potentially be utilized as an industrial ingredient in the manufacture of soaps, pharmaceutical products and cosmetics. Further studies are required to explore the possibility of using this seed oil in industry.

Key Words: Grewia bicolor, Fatty acid profile, physicochemical characteristic, Ethno medicine

South African Journal of Botany 97: 154-158
School Of Entrepreneurship and Business Sciences

55. A Strategic Analysis of Revenue Generated By Churches, In Relation To Possible Tax Loss, With Specific Reference to Pentecostal Churches in Zimbabwe

Sifile, O., Mukwapuna, R., Mabvure, T. J. and Matowanyika, K

ABSTRACT
Churches are now in the practice of lavish spending and are competing stiffly with the corporate world in property acquisitions. Pastors (also fashionably called prophets) are now living lives beyond those of executives of blue chip corporates. The research was carried out with the main aim of analysing revenue generated by churches in Zimbabwe, Pentecostals per se. The main thrust was to establish the possibility of introducing tax on revenue generated by churches in a developing country like Zimbabwe which has a budget deficit and a dearth of funds to improve the economy, yet pastors and their Pentecostal churches spend lavishly without being taxed like other citizens. The study adopted the qualitative and quantitative approaches in order to undertake an in-depth analysis of revenue generated by churches. This concentrated on the use of primary data collection method (questionnaires, interviews and participatory observation). The findings of the study were used to ascertain the impact of religion (churches) on social, political and cultural factors of any society, mainly because churches are drawing huge number of followers (devotees) from the society. The taxation of Pentecostals may immensely improve revenue collection for the state and also deter abuse of funds of congregants.

Key Words: Taxation, Pentecostal churches, pastors, prophets, revenue, Zimbabwe

Corporate Board Failure In Zimbabwe: Have Non – Executive Directors Gone To Sleep?

Sifile, O., Devi, S. K. S., Mabvure, J. T., Chavunduka, M. D. and Dandira, M. 2014

ABSTRACT
The review focuses on board failure especially in the developing world, and in particular, Zimbabwe. The review asks pertinent questions: Why are boards failing? How are boards populated? What are the characteristics that determine selection to the board? Who selects directors? The review establishes that there is need for a corporate governance code and awareness of corporate governance practices in Zimbabwe. Directors are usually selected through the influence of the CEO and such directors have weak oversight on the performance of the CEO. Some characteristics that determine director selection are gender, age, educational qualifications, experience and financial expertise. Directors are stewards who have to be accountable to all stakeholders. There is need to establish how directors are selected in light of the high rate of company and board failures. That directors are also chosen by the CEO is worrying. The selection process should yield capable, independent and diverse directors who can satisfy the expectations of a wide spectrum of stakeholders.

Key Words: Corporate Governance, Board, Directors, Director Selection, Zimbabwe

57. Internal Audit Perceptions and Their Impact on Performance of the Internal Audit Function

Sifile, O. and Munyunguma, I. N

ABSTRACT
This research sought to examine the factors causing negative perceptions of internal audit and the impact on the performance of the internal audit function. The researcher used questionnaires to collect data. There were 78 questionnaires distributed and 69 were received giving a response rate of 88.46%. The researcher used managers, section heads, supervisors and clerical staff as respondents. The research used exploratory and qualitative techniques. The causes of negative perceptions were agreed by 78% of respondents and some of the causes of negative perception were; auditors failure to meet expectation gap, bad reputation of an auditor, the quality of audit staff, level of professional competence and the absence of independence and objectivity in internal audits. The research proposed strategies which can be used to improve perceptions about internal audit as follows: Internal audit needs to adopt a new mind set in view of the many changes that are taking place in the business environment, to correct the anomalies when you receive a qualified audit opinion and correct the errors rather than change the auditor, in the prevalence of financial scandals, intense focus on corporate governance. Auditing can be improved by getting adequate support from management, recruiting qualified and professional auditors and management can improve internal auditing by demonstrating commitment to implement audit findings.

Key Words: Internal auditing, Hwange Area, Zimbabwe

58. Antecedents for Effective Management of Public Enterprise Restructuring In Zimbabwe: An Organizational Culture Perspective

Chavunduka, D., Fauzi, R., Muranda, Z., Sifile, O., Mabvure, T. J. and Dandira, M. 2014.

ABSTRACT

In Zimbabwe, the process of restructuring of public enterprises has encompassed a number of strategies such as commercialization, privatization, downsizing, management contracts and joint ventures. Despite these efforts, no significant improvement in performance of these enterprises has been observed. Recent studies elsewhere seem to suggest that culture is an important tool in organizational performance. The purpose of this research was to determine whether organizational culture can be used to create leverage for the performance of these public enterprises. A descriptive survey research design was used to collect data from restructured Public Enterprises using the culture assessment instruments. Results show that organizational culture is critical in improving performance of these entities. There is need for government to encourage a clan culture in which there is continual dialogue between all stakeholders of the system.

Key Words: Public Enterprises in Zimbabwe, restructuring, organizational culture.

The International Journal of Business & Management. Volume 2 Issue 10
ABSTRACT
This article examines the relationships among consumer awareness, ethnocentrism, and loyalty toward imported poultry meat products. Four hundred consumers were randomly intercepted while shopping in major supermarkets using an interviewer-administered questionnaire. The structural equation modelling technique was used to test the integrative model. The results show that consumer awareness positively influences consumer ethnocentrism, while consumer awareness does not influence consumer loyalty. The results also reveal that consumer ethnocentrism negatively influences consumer loyalty. It is recommended that marketers consider consumer awareness, ethnocentrism, and loyalty when designing marketing programs in developing countries such as Zimbabwe. Poultry marketers are advised to offer quality products accompanied by aggressive promotions to improve their image. Foreign poultry marketers should also consider setting up manufacturing facilities in developing countries such as Zimbabwe so that their products may be viewed as appropriate and contributing to the development of these economies.

Key Words: Consumer awareness, consumer behaviour, consumer ethnocentrism, consumer loyalty, poultry imports

ABSTRACT
Considerable attention has been given to the construct of customer loyalty in marketing practice and research. However, this construct remains relatively unexplored. Its measurement has generated substantial debate and confusion. The introduction of the attitudinal and behavioural approach to the measurement of customer loyalty has managed to bring marketing minds together. And yet, there is a dearth of empirical evidence on the reliability and validity of this approach. This study, therefore sought to assess the reliability and validity of the attitudinal and behavioural typology of customer loyalty in Zimbabwe, a developing country. The study took a cross-section of 400 consumers in two major cities (Harare and Bulawayo) in Zimbabwe. An interviewer-administered questionnaire was used to collect data. Consumers were randomly intercepted while shopping in major supermarkets. A measurement model was developed and validated using structural equation modelling in AMOS 21. The study established that the attitudinal and behavioural typology is a reliable and valid measure of customer loyalty. Thus, the attitudinal and behavioural typology of customer loyalty is applicable in developing countries such as Zimbabwe. Marketing practitioners and researchers in developing countries are, therefore, recommended to consider both attitudinal and behavioural components when planning customer loyalty programmes and conducting consumer research.

Key Words: Consumer behaviour, Customer loyalty, Dimensions of loyalty, Typology of loyalty, Measurement of loyalty

Mediterranean Journal of Social Sciences, MCSER Publishing, Rome-Italy
Doi:10.5901/mjss.2015.v6n1s1p310
Measuring Consumer Attitude towards Imported Poultry Meat Products in a Developing Market: An Assessment of Reliability, Validity and Dimensionality of the Tri-Component Attitude Model

Makanyeza C. 2014

ABSTRACT

As competition increases the world over, it has become imperative for marketers to understand their target customers. In this regard, consumer attitude towards imports has received increased attention in research. Despite its importance in marketing, consumer attitude has not been measured consistently. This study, therefore, sought to assess the measurement of consumer attitude by considering the reliability, validity and dimensionality of consumer attitude towards imported poultry products in Zimbabwe—a developing market—using the Tri-component attitude model as the basis for the research model. A cross-section of 400 poultry consumers was taken in Harare and Bulawayo using an interviewer-administered questionnaire. The structural equation modelling technique was applied to analyse data. The study found that consumer attitude toward imported poultry products comprises three dimensions, namely beliefs (cognition), feelings (affect) and intentions to buy (conation). Marketers and researchers are advised to consider these factors when measuring consumer attitude toward imported poultry products in developing countries.

Key Words: Attitude, Consumer attitude, Consumer behaviour, Consumer behaviour theory, Tri-component attitude model


ISBN: 978-0-7974-7047-7
School Of Hospitality and Tourism


Kabote F., Mashiri, and Vengesayi S. 2014.

ABSTRACT
There has been too much attention to international tourism in developing nations than domestic tourism. However; international tourism has proved that it is highly sensitive to international trends like global financial crises, terrorism, sustainability issues and politics. On the contrary domestic tourism is stable and has proved to be a source of tourism development in other nations. Thus this study sought to explore the extent to which pricing was affecting the performance of domestic tourism in Zimbabwe using a descriptive survey. Domestic tourists staying in hotels made up the population. Results indicated that most tourism products were moderately priced. It was also revealed that Zimbabwean domestic tourists are highly price sensitive. It was concluded that in Zimbabwe pricing policies are affecting domestic tourism performance. Major insights were that domestic tourists were in favour of least pricing, discount pricing, differentiated pricing and price bundling.

Key Words: Pricing; Domestic Tourism, Tourism Performance, Zimbabwe, Tourism Economics

African Journal of Hospitality, Tourism and Leisure Vol. 3 (2) - (2014) ISSN: 2223-814X AJHTL - Open Access- Online @ http//: www.ajhtl.com
63. The Effects of Dollarization on Human Resources in the Hospitality Industry in Zimbabwe


ABSTRACT
The study investigated effects of dollarization on Hospitality Industry’s Human Resources. A qualitative study was done in hotels located at one of Zimbabwe’s renowned tourist resort (Nyanga). Semi structured questionnaires were used to collect data and thematic data analysis adopted. Major issues to emerge from the study were improved employee performance, decreased staff turnover, high staff morale and improved employee benefits. It was concluded that apart from the disadvantage of the country’s loss of monetary and fiscal sovereignty, dollarization positively affected the hospitality industry’s human resources. It is therefore recommended that dollarization should continue in the Zimbabwean economy for continued benefits of employees and their families until such a time when introduction of local currency does not in any way erode the gains realised as a result of dollarization.

Key Words: Dollarization, Human Resources, Hospitality Industry, Zimbabwe

ABSTRACT:
New technology adoption has been recognised as vital in the stability and growth of a country’s economy. Globally the beauty therapy industry has embraced technological advances. In Zimbabwe basic beauty therapy that does not use modern complex technology is prevalent. The objectives of the study were; to establish technologies being used in Zimbabwe’s beauty therapy industry, to examine the perceptions of beauty therapists on new technologies in the beauty therapy industry, and to explore strategies that may be adopted to improve the adoption of new technologies in Zimbabwe’s beauty therapy industry. A purposive and convenient sampling was used to select thirty one beauty therapist experts for one hour long in-depth recorded interviews. The participants viewed modern technology adoption as critical for the industry. Non-accessibility of modern technologies, lack of supportive government policies; non-existence of a beauty therapy association, lack of proper beauty therapy education and under research were found to hinder modern technology adoption. The study revealed that industry is ready to adopt modern technology and there is need to realign the macro environment to make it supportive for the adoption to be real.

Key Words: Beauty Therapy, Technology Adoption, Cosmetology, Dermatology, Zimbabwe.

ABSTRACT
Zimbabwe’s brand theme “Discover Zimbabwe” put in place soon after the country’s independence was replaced by “Zimbabwe: Africa’s Paradise” which was characterised by images of economic hardships which negatively affected tourism development resulting in the destination being rebranded to “Zimbabwe: A World of Wonders”. In today’s competitive environment, destinations have to fight for visitors and therefore strategic approaches to destination branding are essential. The failure to incorporate stakeholder perspectives in managing brands to competitively contribute to tourism development can compromise collaboration amongst different players in the tourism sector. This study used a quantitative approach to explore Tour Operators’ perceptions on Zimbabwe’s destination rebranding exercise (Zimbabwe: A World of Wonders), mainly focusing on brand coverage, stakeholder consultation and value for money associated with the brand. Findings from the study indicate that in terms of brand coverage, Zimbabwe: A World of Wonders brand covers extensive aspects (economic, heritage, and destination accessibility). Further the findings indicate that stakeholders were consulted on policy and partnership issues but implementation was the challenge. We therefore concluded that in as much as the brand covers a wide range of aspects, issues addressed during stakeholder consultation have to be implemented for the brand to succeed.

Key Words: branding, rebranding, tour operator, destination, stakeholders
66. Collaboration and Stakeholder Involvement for Tourism Development in Zimbabwe

*Tawonezvi C., Mirimi K., and Kabote F.* 2014

**ABSTRACT**

The paper conceptualizes a stakeholder model that reflects their involvement for tourism development. The model integrates key sequential concepts such as stakeholder research, stakeholder strategy formulation and stakeholder implementation. Stakeholder research will be inevitable so as to unearth the true state of affairs as well as unravelling the existing challenges within the tourism industry. Strategy formulation of stakeholders will involve collaboration and consultations among the various key stakeholders to craft measures on how best tourism development can be achieved; measures may include capacity building or establishing a communication platform. Implementation involves putting all the strategies into action and involving all stakeholders. The conceptual model results from the syntheses of literature for successful stakeholder processes and developing collective commitment and capacity to turn ideas and plans into action. Both theoretical and empirical works were consulted in structuring the model and specification of its various concepts.

**Key Words:** Stakeholder, Stakeholder involvement. Collaboration, Tourism, Tourism development

*International Journal of Advanced Research in Management and Social Sciences*

ISSN: 2278-6236 Vol. 3 No. 1. PP 1-9
ABSTRACT
Studie of football fandom from across the world all highlight masculine and misogynistic tendencies amongst the fans, players and administrators who populate football stadiums. Domination of men's football spaces by men makes stadiums hostile environments for women who are often physically and verbally abused. This paper outlines the experiences of female fans who attend matches in Zimbabwe. It provides a nuanced analysis of female fans’ responses to the masculine and phallocentric nature of the football stadium. In Zimbabwe female fans are increasing in number, challenging the dominant belief that stadiums are no-go areas for women. Using in-depth interviews and focus group discussions with 40 female fans, the paper highlights how women react, negotiate and respond to misogynistic and vulgar songs and chants. This research in Zimbabwe brings to the fore the voices of female fans and how they construct the stadium experience. The paper draws from in-depth interviews and focus group discussions to highlight how female fans cope with masculine nature of stadiums. Women use various strategies such as joining in the singing, remaining oblivious, sitting in quieter parts of the stadium and responding to abusers.

Key Words: female fans, Zimbabwean football, masculinity, stadium culture, femininities

68. Patriarchy, Women, Land and Livelihoods on A1 Farms in Zimbabwe

Chiweshe, M.K., Chakona, L. and Helliker, K

ABSTRACT

In this article, we focus on patriarchy, women, land and livelihoods on A1 farms in Zimbabwe which arose from the fast track land reform programme. There is now significant literature on A1 farms in Zimbabwe. These studies include a number of ethnographic and comparative studies but this literature does not give sustained attention to patriarchy and women. In addition, though, a small number of works have appeared based upon a more focused gender analysis. We draw upon this more focused literature and offer fresh fieldwork evidence based on recent studies undertaken by two of the authors, in Goromonzi and Mazowe districts. At times, radical socio-spatial reorganisation such as fast track may destabilise systems of patriarchy. In the case of fast track, there has been a reconfiguration of relations between men and women yet this is uneven and contradictory and remains within the confines of patriarchal structures, practices and discourses. At the same time, women have manoeuvred and negotiated at local levels to enhance their lives and livelihoods.

Key Words: Women, land reform, small scale farmers, livelihoods, patriarchy

Large-scale land deals have become a recurrent phenomenon within the last five years. This has led to land deals being negotiated with state, individual and nongovernmental actors, leading to the production of agro-fuels. This article investigates how the large scale commercial land deals have affected the livelihoods of women small holder farmers, the role of global capital in entrenching discrimination of women and how the politics of resource use and distribution has become a central force in shaping livelihoods in Zimbabwe’s communal areas. The article is based on fieldwork that was conducted in Ndowoyo communal area, in Chisumbanje village, from July 2011 until April 2012. The methods used for collecting data were in-depth interviews with the women, interviews with officials from the Platform for Youth Development, a nongovernmental organisation, Macdom Pvt Ltd and Ratings Investments, focus group discussions and personal observations that involved interactions with the women. In 2011, Macdom Pvt Ltd and Ratings Investments, both bio-fuel companies owned by Billy Rautenbach started green fuel production operations in Chisumbanje and this has led to the altering of the livelihoods systems of women smallholder farmers.

Key Words: Agro-fuel; large scale land deals; women’s livelihoods; Zimbabwean politics; Zimbabwean female agency

International Journal of African Renaissance Studies - Multi-, Inter- and Transdisciplinarity, 9 (1) 84-99, DOI: 10.1080/18186874.2014.916879
70. The Problem with African Football: Corruption and the (Under) Development of the Game on the Continent


ABSTRACT
Rampant corruption, maladministration and lack of accountability have negatively impacted on the development of football in Africa. Football has turned into a billionaire dollar industry across the world but Africa remains at the periphery of this lucrative system. It is believed that many factors such as the predatory and globalised nature of major European leagues, Africa’s problem stem from systematic and institutionalised problems with its football administration structures. This paper highlights examples from across Africa to show that corruption is an endemic part of football administration on the continent. The continued under performance of African teams over the years will be used as a yardstick to measure the stagnant nature of the game in Africa. Local leagues and clubs on the continent are largely run unprofessionally except in a very few countries such as South Africa and accusations of match fixing are abound. Coupled to this, political interference provides a context in which football becomes a complex social construct in which space, culture, politics and economics intersect to produce very little development of the game as a vibrant commercial entity. Yet FIFA’s standing statutes of non-interference have often meant corrupt leaders continuing in their positions for decades. The question is what then for African football given the deep rooted and structured nature of corruption.

Key Words: Football, corruption, Africa, sport

ABSTRACT
Zimbabwe’s Agrarian livelihoods have drastically changed within the last decade due to the Fast-Track Land Reform Programme (FTLPR) that saw massive transfer of land from white commercial farmers to black farmers. The agricultural revolution led to re-peasantization processes coming back on the national agenda, with women participating in the process of land acquisition and investing in farming activities. In this article, we discuss the role that women have been playing in the new agricultural sphere in Zimbabwe, in light of land acquisition modes, the crops that are grown and the different entrepreneurial activities undertaken by women. The article demonstrates how re-peasantization processes have led to the recognition of land as a central resource shaping rural livelihoods, especially for women, in terms of contributing to the national and household food baskets.

Key Words: Women, land reform, migration, livelihoods, re-peasantization

Agrarian South Journal of Political Economy, 3: 45, DOI: 10.1177/2277976014530225

*Chiweshe, M.K. and Mutopo, P.*

**ABSTRACT**

Literature on large land deals has proliferated over the past three to four years as debates around the morality of such initiatives is questioned. In the case of many countries in Africa, land deals have impacted negatively on local populations as people have lost their land and access to land based livelihoods. This study avoids univerlising negative experiences of large land deals and offers an in-depth analysis of the Zimbabwean case. We question the identity and organisation of the various actors involved in these deals and how they impact local communities. The research provides focus on both the positive and negative aspects of large scale land deals in Zimbabwe. It offers recommendations for a framework that will ensure land deals are a win-win situation for all. The research is thus an initiative to document and analyse the actors and modalities of land deals, and to examine the challenges and opportunities of land deals. Within the Zimbabwean context we witness an interesting mixture of international investors, politicians and rich white business coming together to acquire large tracts of land. The study focuses on Nuanetsi Range in Mwenezi and bio fuel plant in Chisumanje.

**Key Words:** Land deals, Zimbabwe, small holder farmers, capital
An Investigation into the Marginalisation of Adolescent Girls from the Agrarian Structure and Its Impacts on Their Livelihoods in Africa: Experiences from Zimbabwe


ABSTRACT
The paper uses Intersectionality Theory to understand the “invisibility” of young women which is exacerbated by cultural traditions of low status, stigmatization, and gender stereo types. Youths are not homogenise group with similar interests and problems. Girl youths have historically faced disadvantage in Africa even within programming because they are found at the intersection of age and gender which leaves them vulnerable to main things such as HIV infection. Vulnerable groups of female adolescents in sub-Saharan Africa are among the most at risk populations yet programming has failed to adequately reach them. Current strategies and programs are not reaching this population because there is little knowledge documented about girl youths as many focus on youths as a singular group. Many assume that information and services reach vulnerable female adolescents through urban, school, or youth-centred programs, yet evidence indicates that they are not being reached. Mainstream HIV prevention messages have little relevance to lives of highly vulnerable female adolescents because they assume that these adolescents exert some control over the timing and frequency of sexual encounters, use of condoms and HIV status of their partners, when they do not.

Key Words: Adolescent girls, land, livelihoods, marginalisation, Zimbabwe

74. Understanding Social and Solidarity Economy in Emergent Communities: Lessons from Post–Fast Track Land Reform Farms in Mazowe, Zimbabwe

Chiweshe, M.K.

**ABSTRACT**

This paper deals with the emergent and evolving forms of social organization in Zimbabwe’s post–Fast Track Land Reform Programme (FTLRP). It highlights the way in which these institutional formations show the emergence of a social and solidarity economy in which self-help and grassroots organizations surface as a viable alternative to state or capitalist interventions. In 2000 Zimbabwe experienced a major shift in its rural landscape when land occupation and government-initiated land reform saw the emergence of new communities of black farmers on formerly white-owned farms. The government of Zimbabwe had neither the funds nor the capacity to provide social amenities when the fast track programme began. This paper shows how small-scale farmer communities ensured service provision through their own initiative. The government did not have the resources to monitor, let alone force, people into functional communities. It is through informal farm level institutions built up through interaction and negotiation, and based on trust, reciprocity, unity of purpose and communality, that these communities have sustained their existence and are part of an emerging social and solidarity economy.

**Key Words:** Social and solidarity economy, Zimbabwe, Fast Track Land Reform, social capital

75. Water Resources and Biofuel Production after the Fast-Track Land Reform in Zimbabwe

Mutopo, P. and Chiweshe, M.K. 2014

ABSTRACT
Discourses on the fast-track land reform programme in Zimbabwe have produced multiple and contested knowledge. Current debates have addressed the increase in biofuel production, which has been pioneered by different state and non-state actors. This has led to debates about understanding who wields more power in terms of the regulation of the agro-based fuel industry at a time of land redistributive reforms in Zimbabwe. Little attention, however, has been given to the issue of water resources in the current biofuel production projects. By examining the large-scale production of Jatropha and sugar cane in Chisumbanje and Mwenezi districts in Zimbabwe, we seek to unravel how the new investors have accumulated land and water resources. We analyse how this lead to water competition between the communities, settled in Chisumbanje and Mwenezi, and the new biofuel actors. In the following discussion, we seek to answer the following questions. What is the configuration of the new politics of water and post-land reform in Zimbabwe and how has it been impacted by biofuel production? How has competing water interests impacted principles of Water Act (1998) in Zimbabwe as biofuel production requires the use of large volumes of water? How are water resources creating conflicts over access and use in these communities? What role do water institutions play in these circumstances? How are different smallholder farmers and new conglomerates sharing water in a tense environment especially after fast-track land reform? We use ethnographic fieldwork in Mwenezi district and archival research in the case of Chisumbanje to outline various debates and viewpoints related to these questions.

Key Words: Water resources; water access; biofuel production; smallholder farmers; conflicts

African Identities, DOI: 10.1080/14725843.2013.868673
76. Women, Mobility and Rural Livelihoods in Zimbabwe: Experiences of Fast Track Land Reform

Mutopo P.

BOOK SUMMARY
This book is based on iterative multi-sited ethnography at Merrivale farm, Tavaka village, and various sites in South Africa. The author reveals how the dynamics generated by fast-track potentially offer new development opportunities – specifically for women. The findings challenge existing expert notions and opinions about women’s rural land use, livelihoods, and rural development. The book examines how negotiations and bargaining by women with family, state, and traditional actors have proved useful in accessing land in Mwenezi district, Zimbabwe. The hidden, complex, and innovative ways adopted by women to access land and shape livelihoods based on transitory mobility are examined. The role of collective action, conflicts, conflict resolution, and women’s agency in overcoming the challenges associated with trading in South Africa are examined within the ambit of the sustainable livelihoods framework, a gendered approach to land reform and social networks analysis.

Belonging and Rural Livelihoods: Women\'s Access to Land and Non-Permanent Mobility at Merrivale Farm, Mwenezi District, Zimbabwe

Mutopo P. 2012.

ABSTRACT
The fast track land reform programme in Zimbabwe has reshaped rural livelihoods as land has become a major asset for rural people. The major question that I sought to answer in this study is how have rural women become important actors in accessing land and shaping non-permanent mobile livelihoods in the context of the fast track land reform programme, riddled with conflicts? The data for the article is based on an ethnographic study that I undertook at Merrivale farm, Tavaka village, from April 2009 until August 2012. Major results that emanated are that women have become major actors in land acquisition and non-permanent mobile livelihoods. Problematising the notion of conflicts from two angles in this paper helps in understanding how mobility, linked to land acquisition and land use, is central in the evolving of conflicts in the new resettlements. Connecting land access, social networks and mobility to South Africa and the conflict paradigm brings out how land-based livelihoods are embedded with social mishaps in the new resettlement. The concept of "home" becomes central in resolving conflicts and affects how conflict mechanisms are reached at Merrivale or in South Africa. I explore the conflict resolution approaches women used to solve at Merrivale and in South Africa.

Key Words: Fast track, land reform, mobility, women, conflicts, conflict resolution, belonging, home

Erdekunde, Vol 68, no 3, pp. 197 – 207
78. Confirmations, Coffins and Corn: Kinship, Social Networks and Remittances from South Africa to Zimbabwe

Vupenyu D., Mutopo P., and Landau L.B

ABSTRACT
Despite much optimism about migrant remittances’ power to combat poverty, we know too little about their long-term consequences in sending communities. Through an intensive qualitative study of three districts in Zimbabwe – Chivi, Gwanda, and Hurungwe – this paper explains why significant resource flows from migrants to South Africa have done little to eliminate chronic poverty. Part of the explanation stems from the districts’ political economy: where remittances help generate income, this largely replaces streams lost through the country’s overall economic decline. Further investments are often discouraged by poor physical infrastructure, the shortage of inputs, and market precarity. While other studies identify such material factors, this work draws particular attention to how the moral economy of remittances also directs resources away from income generation and towards ‘social’ and ‘god taxes’: paying for neighbours’ immediate needs, investing in events and infrastructure intended to boost one’s social status, or donating large sums to the church. Underlying this is a paradox: where networks are weak, as in the case of the communities with more recently formed mobility patterns, there are few pressures on migrants to remit. Yet, while social networks are critical for extracting resources from migrants, local expectations within sending communities often mean that moneys are spent on maintaining a social safety net and social status rather than directed into financially productive investments. However, this is not irrational spending but rather an investment in social standing and safety: selfishness and self-enrichment in an environment of generalised poverty can result in social isolation and occasionally threats to property and lives. Such findings have important implications for understanding how remittances are directed and our expectations regarding their potential effects at promoting social protection and poverty alleviation.

Key Words: Migration, remittances, social networks, South Africa, Zimbabwe

ABSTRACT
The effect of mesh sieve sizes; 0.84 mm, 1.0 mm and 1.19 mm on alcohol concentration, free reducing sugars profile and total acids produced was determined during opaque beer fermentation. The initial free reducing sugars increased from 7.23 ± 0.1 mmol/ml to 7.52 ± 0.03 mmol/ml and 7.67 ± 0.03 mmol/ml values as the sieve size decreased. Meanwhile, the final alcohol concentration attained for each fermentation reached levelled off after 72 hr producing 3.57 ± 0.06 % (v/v), 4.09 ± 0.29 (v/v) % and 4.23 ± 0.25 (v/v) % in order of decreasing mesh sieve size translating to a volumetric productivity of 0.49, 0.54 and 0.61 g.l⁻¹.h⁻¹, respectively. Use of 1.0 mm grinding sieve produced a final ethanol concentration which increased by 9% compared to that of 1.19 mm and 23 % to that of 0.84 mm sieve. This realized a Yₚ/ₛ value increase of 2% with the use of 1.0 mm sieve and 4% with 0.84 mm. The final organic acids determined as lactic acid composition were noted to increase from 0.46 ± 0.01 (w/v) %, 0.48 ± 0.01 (w/v) % and 0.5 ± 0.02 (w/v) % concentration as the sieve size decreased respectively. However, in all brews, the final pH was noted to be of no significant difference (P>0.05) dropping from around the same initial pH value of 5.9 to 3.3. The opaque beer brew prepared with a mesh sieve size 0.84 had its initial free reducing sugars the highest and produced a brew with the highest final ethanol concentration that levelled off at 4.23 ± 0.25 (v/v) % after 120 hr. However, it was noted that mesh sieve size 1.0 mm, although it had a lower alcohol content compared to 0.84, it was recommended as an optimized maize grits because it produced an opaque beer product which was consistent and of acceptable palatability to the analysis of sensory evaluation.

Key Words: Optimization; Mesh sieve size; Fermentation; Lactic acid and alcohol
ABSTRACT

Encosternum delegorguei Spinola (Hemiptera: Tessaratomidae) are consumed as relish and with traditional claims of having medicinal roles in the South-Eastern districts of Zimbabwe. However, very little has been explored scientifically to validate these claims. The current study was conducted to investigate bio-active compound composition and diversity of stable antibacterial activity from E. delegorguei extracts. Methanol, ethanol and aqueous extractions of E. delegorguei were performed followed by qualitative, quantitative analyses of hytochemical/bioactive compounds and determination of antibacterial activities using disc diffusion method on ten clinically important microbes. Alkaloids, flavonoids, anthraquinones, tannins, phlobatannins, steroids, triterpenoids and cyanogen glycosides were detected in the insect extracts. Flavonoids were detected in significantly higher concentrations in unprocessed compared to processed insects. Mean DPPH free radical scavenging activities were 78% and 88% for traditionally processed and raw insect extracts respectively. Traditional processing resulted in reduction of bioactive compounds (22.2% total phenolics; 68.4% flavonoids) and free radical scavenging activities by 10%. However, it resulted in an increase of cyanogen glycosides by 65.7%. Methanol extracts produced highest mean inhibition zones of 20 mm while aqueous and ethanol extracts had mean inhibition of 0 to 15 mm as compared to control with 20-40 mm. High flavonoids levels could be beneficial to consumers. However, a potential trade-off from elevated levels of cyanogen glycosides after processing needs further investigation. The free radical scavenging activity displayed by E. delegorguei extracts indicate a potential source of natural anti-oxidants that can be formulated into commercial products.

Key Words: antibacterial, Encosternum delegorguei, free radical scavenging, phytochemical
81. Application of Diet to Eliminate Gastroesophageal Complications in People Suffering From Heartburn

Usai T, Mushawarima T, and Zvidzai C

ABSTRACT
Obesity and overweight are risk factors of heartburn and oesophageal erosions. Consumption of appropriate diet that has reduced quantities of fats, carbohydrates and proteins helps to reduce gastroesophageal disease (GERD). This study assesses the effect of medication and diet on relieving gastroesophageal symptoms caused by excessive production of gastric acid. Physical observations on lifestyle of participants were made. A questionnaire with a reflux symptom score index was used to monitor the severity of symptoms. The body mass index (MBI) was determined. One group of participants was subjected to prescribed diet and medication. The other group was given prescribed diet and placebo. Medication and prescribed diet reduce gastroesophageal symptoms.

Key Words: Obesity, heartburn, gastroesophageal symptoms, medication and gastric acid.

ABSTRACT

The purpose of this study was to investigate nutritional and phytochemical composition of *Henicus whellani* Chopard, a seasonally occurring ground-dwelling cricket consumed in south-eastern Zimbabwe. Insects were sampled from four quadrants (approximately 100 m²) in one representative site (approximately 3000 m²) in Bikita District, and were hand-picked or dug out from burrows in a manner similar to traditional insect-harvesting practices. Proximate composition using whole-dried insects and bioactive components using dried pulverized material were analysed using standard procedures. The proportional nutrient composition was 53.6% crude protein, 4.3% fat, 13.4% ash, 10.6% crude fibre, 4.0% carbohydrate and 268.3 kcal/100 g energy. Phenolics, tannins, alkaloids, cyanogenic glycosides, oxalates, saponins and flavonoids were present in the extracts of insects. The quantities of saponins (53.3 mg/g) and alkaloids (52.3 mg/g) were higher than those of other phytochemicals, with the quantity of tannins (0.168 mg/g) being the lowest. Radical-scavenging capacity determined using di (phenyl)-(2, 4, 6-trinitrophenyl) iminoazanium (or 2, 2-diphenylpicrylhydrazyl) and methanol extracts was 42%, which is lower than those of the standards. This study shows that *H. whellani* provides potential nutritional benefits in terms of protein, fibre and flavonoid contents. The relatively high ash content compared with that from other edible insects indicates a rich source of minerals such as calcium, iron, magnesium, phosphorus and potassium. However, the presence of saponins, oxalates and tannins could be a limitation and requires further studies. There is a need to evaluate the bio accessibility of the nutrients and the safety of bioactive compounds in relation to human consumption.

83. Assessing the Spectral Separability of Flue Cured Tobacco Varieties Established On Different Planting Dates and Under Different Fertilizer Management Levels

Svotwa, E., Masuka, A. J., Maasdorp, B. V., and Murwira, A.

ABSTRACT
The NDVI was used to discriminate tobacco variety, assess fertilizer levels, and determine the impact of planting date on separating crops. A split plot design with four planting dates, September, October, November, and December, as main plots, variety as subplot, and fertilizer treatments as sub-subplots was used. Radiometric measurements were taken from 5m × 5m sampling plots, using a multispectral radiometer. The September, October, and November crops had significant variety x fertilizer treatment differences (F< 0.05) from the age of 10 weeks. T 66 and KRK26 varieties had similar (F> 0.05) NDVI values and these were greater (F< 0.5) than those for K E1. The 100% and the 150% fertilizer treatments were similar (F> 0.05) and both were greater (F< 0.05) than the 50% fertilizer treatments. All of the fertilizer and variety treatments at the December planting dates had similar reflectance characteristics (P> 0.05), which were lower (P< 0.05) than the September and October planting dates. The results showed that planting dates, varieties, and fertilizer levels could be distinguished using spectral data. Weeks 10-11 and 15 after the start of the experiment were optimal for separating the planting date effect.

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ABSTRACT

Research on assessing flue cured tobacco canopy response to cultural management using remote sensing was done using the multispectral radiometer (MSR 5) derived NDVI. MODIS satellite platforms provide adequate spatial resolution for large scale crop assessments but have a low spectral resolution and are susceptible to atmospheric interference. This experiment sought to develop estimation models for flue cured tobacco agronomic parameters based on established relationships with MSR 5 and MODIS derived NDVI and field measured agronomic parameters. MSR 5 and MODIS reflectance readings were collected weekly from six tobacco fields, between 1 and 12 weeks after planting. Satellite data was ordered from the USGS Glovis Website using the Earth Explorer interface to identify the experimental fields. The linear models for estimating biophysical parameters like leaf length, leaf width, plant height, leaf number and geometric mean leaf area were developed. Using a simple function relating MSR 5 and MODIS derived NDVI, and by substitution of NDVIMSR with the NDVIMOD, the estimation models for the tobacco biophysical plant parameters were also derived. The results from the study can improve the accuracy of tobacco crop monitoring and vigor assessment on a large scale.

85. Tobacco Yield Forecasting in Zimbabwe Using Operational Remote Sensing and Statistical Techniques

Svotwa, E., Masuka, A. J., Maasdorp, B. Murwira, A., and Masocha, M

ABSTRACT

In this study, remotely sensed data and field measurements were used to develop a simple but robust method for estimating the tobacco hectarage and yield in Zimbabwe. The current conventional tobacco yield forecasts rely on seed purchase records, land area record and visual assessment of the crop. This is costly, time consuming and unreliable. Between 2010 and 2013, starting from September, agricultural field boundaries from a pseudo natural colour composite Landsat Thematic Mapper (TM) satellite imagery were visually interpreted and digitized. Cloud free MODIS images covering the period September to end March were downloaded and geo referenced. For each MODIS image, NDVI was estimated. Mean temporal NDVI profiles for these crops using data from sampled tobacco fields were calculated separately and compared. The results of this study indicated that, based on MODIS NDVI data, the third to fourth week of November and the third to fourth week of February are the optimal times for discriminating the irrigated from the non-irrigated tobacco. The crop areas for the three seasons were estimated and yield estimates calculated from the long-term cropped yield-area regression model. The three seasons average yield estimates were 98.8% accurate, as compared to 112% for the traditional method.

86. The Relationship between Ground Based Multi-Spectral Radiometer Sensor Derived NDVI and Agronomic Variables of Flue Cured Tobacco for In-Season Crop Monitoring

Shamudzarira, M., Sivotwa, E., and Manyangarirwa, W.

ABSTRACT
In-season tobacco crop status monitoring is used to evaluate the effect of cultural practices and environmental interactions that ultimately determine crop yield. In this experiment the relationship between hand-held Multispectral Radiometer (MSR 5) derived Normalized Difference Vegetation Index (NDVI) and tobacco biophysical parameters were established. From 100 Ha of tobacco crop, sampling sites were randomly selected for reflectance measurements and corresponding leaf length, leaf width, plant height, leaf number counts and above ground biomass. The biophysical parameters data was collected for 12 weeks from the age of 1 week after planting. The coefficients of determination between NDVI and leaf number ($R^2 = 0.88$), leaf length ($R^2 = 0.89$), leaf width (0.82), plant height (0.86), Geometric mean length (0.863) and above ground dry mass (0.888) were high enough to allow for accurate assessment of crop health using NDVI. In-field variations in crop parameters were also observed on tobacco planted on different dates. Crop biophysical parameters are, hence, positively related to NDVI, and these results can be used in making in-season assessment of tobacco crop health, growth vigor and hence in yield estimation.

Use of Multispectral Radiometer and Modis Satellite Data Correlations in Developing Models for Tobacco Yield Forecasting

Svotwa, E., Masuka A. J., Maasdorp B., and Murwira A.

ABSTRACT

The multispectral radiometer (MSR5) and MODIS satellite data correlations were used in developing models for flue-cured tobacco yield estimation. A field experiment was set and a field survey and satellite Earth observations were carried out. Radiometric measurements from the experiment were used to relate normalized vegetation index (NDVI) from the multispectral radiometer to tobacco yield. Ground based MSR5 and MODIS satellite based data correlations were developed using radiometric and satellite spectral measurements collected from a 100 ha tobacco field. NDVI’s were also extracted from the freely downloaded images from 38 randomly selected tobacco fields of at least five hectares in area in the tobacco growing regions of Zimbabwe. The MSR5 based yield-NDVI correlations for the September to October planted tobacco ranged between 0.78 and 0.81, while those for the December planted and the pooled data were 0.91 and 0.51 respectively. The up scaling factor for NDVI_{MSR5} from the NDVI_{MODIS} was developed, and this, in turn was used to develop the final tobacco yield estimation model. The predicted average flue cured tobacco yield (2.72 tons/ha) was 88% of the actual yield (3.08 t/ha) from the project area, and a performed t-test for comparison of means showed that the two were statistically similar (p > 0.05). It is recommended that the model undergoes further test and recalibration before the tobacco sector fully relies on it for crop yield estimation.

Key Words: NDVI, Satellite Data Correlations, Up scaling, Yield Estimation Model.

International Journal of Agriculture Innovations and Research. 3(1) (2014)
ABSTRACT
A research to evaluate the curing efficiency of the rocket barn in Zimbabwe was carried out at Kutsaga research station. The main objectives were to assess the wood fuel consumption and the total time taken to complete curing in a rocket barn (trial) in comparison to the conventional barn (control). Tobacco leaves collected from the same field at the same time were loaded into the barns. Same quantities of fuel wood, with similar moisture content, were loaded into the barns at the same time. Curing also started at the same time. Wood fuel quantity consumed were recorded as well as the total time to complete the curing cycle. The results indicated that the rocket barn consumed about 47 -50% of the wood fuel quantity used in the conventional barn to complete curing. There were no significant differences (P>0.05) in total times taken to complete curing by both barns. The rocket barn is, hence, more efficient in wood fuel consumption and can be recommended for adoption in the smallholder tobacco growing sector in Zimbabwe in order to reduce the rate of tobacco production related deforestation.

Key Words: Curing Efficiency, Deforestation, Rocket Barn, Smallholder Sector, Wood Consumption.

89. Optimizing Grass Mulch Application Rate in Flue Cured Tobacco Float Seedlings for the Control of Salt Injury and Improvement of Seedling Quality

Svotwa, E., Chitambo, T., Chiota, W. M., and Shamudzarira, M.

ABSTRACT
In the tobacco seedling production system, water moves up by capillary action from the water bed to the surface where it evaporates. Salts that accumulate after evaporation cause injury of plants. Some of the well noted effects include ion toxicity and reduction in seed germination, plant growth, and reduced crop yields. An experiment was carried out at Kutsaga Research Station in Harare to optimize mulch quantities in tobacco float seedlings for the control of salt injury and improvement of seedling quality. Vlei grass mulch was applied on experimental plots at 0 kg/ m² (0 % mulch), 0.58 kg/ m² (50 % mulch), 1.16 kg/ m² (100 % mulch) and 1.74 kg/ m² (150 % mulch) in two seasons; 2012 and 2013 in July and in August. Germination percentage, survival counts and seedling damage assessments were measured at 7, 21 and 28 days after sowing (d.a.s). Growing media samples were collected for electrical conductivity (EC) and pH measurements at the same time. In both the July and the August sowings, germination increased with increasing mulch levels. The highest germination percentage (80 %) was attained in August at the 100 % mulch covering. Growing media pH did not significantly differ under different mulch levels but increased with days after sowing in both July and August. Media EC increased with days after sowing, generally, but lethal levels were reached on August sown seedlings at 0 % and 50 % mulch rate. Seedling stem diameter increased with mulch rate in both sowing times, with the maximum attained at 100 % mulch rate. Stem height decreased with increasing mulch rate in the July sown, while the reverse was true in the August sown, where the maximum stem height was attained at 100 % mulch rate. The results show that mulch at the rate of 1.16 kg/ m² (100 % mulch) is required for salt injury control in the float bed for the improvement of seedling survival and seedling quality, measured as stem height and stem thickness during the warmer times of the seedbed season.

Scientia Agriculture. 4 (1), 43-49. (2014)
90. An Assessment of the Effectiveness of Food Aid in Hunger Alleviation in Mutare

Mavuna, L., Mudavanhu, C. and Svitwa, E.

ABSTRACT

This study was designed to assess the effectiveness of food aid in alleviating hunger in ward 29 of Mutare District through establishing the nature and assessing the benefits of food aid. A questionnaire was distributed to forty six (46) households in order to collect primary data for the study. Five (5) interviews two focus group discussions were done with five (5) headmen from different villages an average of six respondents per group respectively. The research was conducted April and August of 2012-2013 phase. From the results, food aid played a significant role in improving food security status of households. Fifty percent (50%) of the respondents were dependent on food aid and these highlighted that food aid has totally enhanced their food security status. The respondents could afford three (3) meals per day and had improved diets. Social improvements in form of increased school attendance were also noted. The study recommended that in order to reduce vulnerability to hunger, the aid implementers must also provide small grain seeds, which are drought resistant and more adaptable to the semi arid conditions of the study area.

ABSTRACT
Yield estimation in flue-cured tobacco production is essential for effective marketing in Zimbabwe as it enables adequate planning and preparation for the expected leaf volumes for merchants, processors and exporters thus ensuring competitive prices for growers. Traditionally, yield estimates have been done using the Gavin method developed in 1984 which is based on an assessment of in-season development of tobacco variables such as leaf length, width, plant height and dry mass using destructive sampling techniques. The objective of this research was to develop quick and non-destructive methods of obtaining tobacco crop variables using ground-based sensors such as the Multispectral Radiometer (MSR 5). Furthermore, the research sought to apply this remote sensing variable estimating method to satellite platforms to allow for large scale, real time crop assessments. The research was based on previous work that determined the Normalized Difference Vegetation Index (NDVI) of tobacco varieties in response to different planting dates and fertilizer regimes. The results showed a positive linear relationship between Moderate Resolution Imaging Spectro-radiometer (MODIS) and MSR 5 derived NDVI’s that was sufficient for estimating tobacco crop variables and yield estimates. Five models for estimating leaf length, width, plant height, Geometric mean area and plant height from NDVI obtained from MODIS and MSR 5 were developed. These models can be used to remotely determine factors that influence yield areas to enable more accurate yield estimation.

Poster presentation at the 2014 Coresta Congress: Agronomy/ Phytopathology-12th-16th October 2014 / Québec City, Canada.

Shamudzarira M.C., Svotwa E., and Manyangarirwa W

ABSTRACT
Insect pests and diseases pose major challenges in tobacco production in Zimbabwe. The Plant Pests and Diseases Act (Chapter 19:08) was introduced to control the transmittance of serious diseases through policy regulated cultural practices in Zimbabwe. All tobacco plants must be destroyed before 15 May; seedbed sowing can only commence on 1 June and, transplanting can only begin on 1 September of each year. Physical monitoring from the ground is used for enforcement of these legislated dates and this requires high staff and travelling costs. There is need for an effective and accurate monitoring method to assist policing agents to ensure compliance. Remote sensing can provide a reliable, fast and accurate means of monitoring tobacco plantings and stalk destruction. This study sought to evaluate three instruments most commonly used in vegetative monitoring Landsat 7, Moderate Resolution Spectro-Radiometer (MODIS) and Multispectral Radiometer (MSR 5) for delineating tobacco fields between 15 March - 15 May, 15 May - 1 August and 1 August - 1 September, over two seasons for 2012-2013 and 2013 - 2014. Normalized Difference Vegetation Index (NDVI) was obtained from tobacco fields with stalks still standing past 15 May, fields where transplanting was done before 1 September and fields where strict adherence to legislative dates had been observed. Significant differences (P<0.001) were noted between NDVI in fields were stalk destruction was done according to legislation and where this was ignored. Significant differences (P<0.001) were also noted between compliant and non-compliant tobacco fields between 1 August and 1 September using the T-test mean separation technique. The study concluded that reliable monitoring of legislative date compliance can be achieved with remote sensing.

Poster presentation at the 2014 Coresta Congress: Agronomy/ Phytopathology-12th-16th October 2014 / Québec City, Canada. Paper Number: Appost 14 (2014)
93. Impacts of Climate Variability and Change and Farmers’ Responsiveness in the Agricultural Sector in Zimbabwe

_Muzari, W., Muvhunzi S., Soropa G., and Kupika O.L_

**ABSTRACT**

Agriculture makes a substantial contribution to Zimbabwe’s economy in terms of employment creation, household incomes, food security and economic growth. In recent decades, the performance of the agricultural sector has been hampered by frequent droughts. The paper uses research results from published and unpublished works to determine the impacts of climate variability and change on crop production, agricultural land use, crop marketing, livestock production, and rural poverty. It also looks at the positive impacts of climate change and farmers’ perspectives on climate change and variability. The adverse impacts of climate change are thought to dominate in the drier semi-arid smallholder communal farming regions. A small temperature rise has been estimated to substantially reduce farm incomes and increase the expanse of drier zones. Meat, milk and draught power productivity will decrease owing to droughts that affect vegetation and water resources in the rangelands. Rural poverty will be exacerbated by climate change. Finally, extended periods of wet weather due to excessive rains will adversely affect crop marketing through crop quality deterioration and destruction of physical marketing infrastructure. However, droughts, floods and excessive rains can also have positive impacts in the form of increased remittances from migrants who migrated in search of alternative sources of livelihood. Moreover, in the aftermath of droughts and excessive rains, livestock have access to abundant water and good quality vegetation to feed on. Furthermore, enough water is available for domestic purposes and watering gardens. Wild fruits and late-planted crops also flourish to the benefit of rural households. Farmers in Zimbabwe perceive that rainfall has become more unpredictable and that the prevalence of mid-season drought spells has increased. In addition, years of below-normal rainfall are becoming more frequent, semi-arid areas are getting drier, temperatures have increased, and droughts and floods are often occurring back-to-back in the same season.

**Key Words:** impacts, climate variability, climate change, farmer, agricultural sector

*International Journal of Science and Research ISSN (Online): 2319-7064. 3 (9): 1726- 1731. (2014)*
ABSTRACT
The smallholder sector is vulnerable to climate change due to its reliance on rainfed agriculture and has the least ability to adapt. Based on appropriate weather forecasts, farmers can mitigate and adapt to climate change through sound crop management decisions. A study was conducted to explore indigenous knowledge system (IKS) weather forecasts as a climate change adaptation strategy in smallholder farming systems of Zimbabwe. Eighty six farmers from three agro-ecological regions with different agricultural potential and cultural backgrounds were involved in the study. Questionnaires and focus group discussions were used to collect data on climate change perceptions, access and interpretation of meteorological forecasts and IKS weather indicators and their use in crop production. Most farmers (93 %) believed that there is climate change, citing low rainfall, late rains and rising temperatures as some of the indicators. Sixty five percent of farmers had access to and can interpret the meteorological forecasts disseminated through print and electronic media, though arguing that the forecasts are not timely disseminated. Sixty seven percent of the respondents were using IKS weather indicators such as wild fruits, trees, worms and wind for predicting seasonal quality in addition to meteorological forecasts. Basing on IKS forecasts, farmers are changing varieties, staggering planting dates, varying fertilizer rates and cropping land area. The study showed that IKS forecasts indicators are different in the three agro-ecological regions, are being used by farmers in making farming decisions and if properly documented and disseminated can be used as a climate change adaptation strategy.

Key Words: climate change adaptation, IKS, meteorological predictions, seasonal climate forecasts, smallholder farming

95. Potential Impact of Wash Bay Effluent on the Water Quality of a Subtropical River

Danha, C., Utete, B., Soropa, G. And Rufasha, S.B.

ABSTRACT

Washbay effluents have received scant attention as a potential source of water pollution globally. This study is the first to investigate the potential impact of the total wash bay effluent content released into river water in Africa. We investigated the potential ramifications of wash bay effluxent released off Charter Estates, Chimanimani in the Eastern Highlands of Zimbabwe on the water quality of the receiving subtropical Nyahode River by measuring selected water limnochemical aspects which included biological oxygen demand (BOD), chemical oxygen demand (COD), oil and grease, pH, sulphates, phosphates, iron, total suspended solids (TSS), dissolved oxygen (DO) and electrical conductivity (EC) once every 3 months from October 2011 to July 2012. The obtained mean levels of the limnochemical parameters from the Nyahode River were compared to the local Environmental Management Agency (EMA) and international World Health Organisation (WHO) effluent standards. Our results show that the control point and the effluent discharge source downstream points in the Nyahode River had water quality parameters that were below the local EMA and WHO water quality threshold values. Cluster analysis showed a strong linkage in the values of water quality parameters measured at sampling sites 3 and 4 which were below the discharge point. Wash bay effluent released from the Charter Estate has an impact on some aspects of the water in the Nyahode River but the river has a functional self-purification capacity. Onsite industrial purification of wash bay effluent before discharge reduces its potential deleterious impact on water quality, river habitat integrity and aquatic biodiversity.

Key Words: Hydrocarbon, Impact, Pollution, River Integrity, Self-Purification


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Chemura, A., van Duren, I., and van Leeuwen, L. 2014

ABSTRACT
Information about age of oil palm is important in sustainability assessments, carbon mapping, yield projections and precision agriculture. The aim of this study was to develop and test an approach to determine the age of oil palm plantations (years after planting) by combining high resolution multispectral remote sensing data and regression techniques using a case study of Ejisu-Juaben district of Ghana. Firstly, we determined the relationship between age and crown projection area of oil palms from sample fields. Secondly, we did hierarchical classification using object based image analysis techniques on WorldView-2 multispectral data to determine the crown projection areas of oil palms from remote sensing data. Finally, the crown projection areas obtained from the hierarchical classification were combined with the field-developed regression model to determine the age of oil palms at field level for a wider area. Field collected data showed a strong linear relationship between age and crown area of oil palm up to 13 years beyond which no relationship was observed. A user’s accuracy of 80.6% and a producer’s accuracy of 68.4% were obtained for the delineation of oil palm crowns while for delineation of non-crown objects a user’s accuracy of 65.6% and a producer’s accuracy of 78.6% were obtained, with an overall accuracy of 72.8% for the OBIA delineation. Automatic crown projection area delineation from remote sensing data produced crown projection areas which closely matched the field measured crown areas except for older oil palms (13+ years) where the error was greatest. Combining the remote sensing detected crown projection area and the regression model accurately estimated oil palm ages for 27.9% of the fields and had an estimation error of 1 year or less for 74.6% of the fields and an error of a maximum 2 years for 92.4% of the fields. The results showed that 6 and 11 year old oil palm stands were dominating age categories in the study area. Although the method could be reliably applied for estimating oil palm age at field level, more attention is required in improving crown area delineation to improve the accuracy of the approach.

Key Words: age detection, oil palm; WorldView-2, object-based image analysis

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An Assessment of Irrigation Water Quality and Selected Soil Parameters at Mutema Irrigation Scheme, Zimbabwe

Chemura, A., Kutywayo, D., Chagwesha, T.M., and Chidoko P

ABSTRACT

Soil salinity and sodicity are major factors limiting agricultural productivity in irrigation schemes located in semi-arid areas. A study was conducted to assess the quality of irrigation water used in Mutema Irrigation Scheme located in south-east Zimbabwe to understand how irrigation water quality is related to the chemical quality of soils in the scheme. Irrigation water samples were collected from groundwater and surface sources in 2012 and their hydrochemistry determined while soil samples were collected from irrigated and non-irrigated parts of the scheme in 2006 and 2012 and analysed for selected chemical properties. The results indicated that the groundwater had high concentrations of Na\(^+\) (4.35 mg/l), Mg\(^{2+}\) (4.75 mg/l), Cl\(^-\) (3.6 mg/l) and Electrical Conductivity (EC) (1729 msm/cm) compared to the surface irrigation water source which had 0.72 mg/l Na\(^+\), 2.25 mg/l Mg\(^{2+}\), 0.78 mg/l Cl\(^-\) and 594 Msm/cmEC. The soils in the scheme had higher levels of pH, Sodium Adsorption Ratio (SAR), Exchangeable Sodium Percentage (ESP) and EC which in some blocks exceeded the threshold requirements for cropping. It was found that pH, SAR and ESP were significantly higher \((p<0.05)\) in irrigated blocks compared to non-irrigated areas of the scheme, indicating an influence of irrigation water on soils characteristics in irrigated plots. Mg\(^{2+}\) and Ca\(^{2+}\) in the soils positively correlated with Na\(^+\) \((r^2=0.67\) and \(r^2=0.57\) respectively). The results indicated that the groundwater presents a chloride hazard to the soils in the scheme which are becoming saline and therefore require proper management and choice of crops to sustain crop production.

Journal of Water Resources and Protection, 6(2), 132-140, DOI: 10.4236/jwarp.2014.62018
98. Effect of Soil Moisture Deficit Stress on Biomass Accumulation of Four Coffee (Coffea Arabica) Varieties in Zimbabwe

Chemura, A., Mahoya, C., Chidoko, P. and Kutywayo, D

ABSTRACT
Drought tolerance is increasingly becoming an important requirement of coffee varieties because of climate change and high costs of irrigation. A study was conducted to evaluate four common coffee varieties in Zimbabwe for drought tolerance and ability to recover. The plants were subjected to soil moisture deficit stress for 21 and 28 days with evaluation of recovery done 14 days after interruptive irrigation for both periods. Results showed that the varieties were not significantly different in initial fresh and dry biomass before stressing (p>0.05). CR95 had significantly accumulated more (p<0.05) dry root mass (0.8g) than the rest of the varieties after 21 days of soil moisture deficit stress. SL28 and CR95 had an 8.3% increase in dry biomass while Cat128 did not gain any dry biomass after 21 days of drought stress. Significant differences in shoot biomass due to variety were realized in dry biomass after 28 days of soil moisture deficit stress where CR95 had more shoot dry biomass (p<0.05) than the rest of the varieties. Cat128 lost the greatest fresh biomass after 21 days of stress (-25.0%) followed by SL28 (-21.9%) while CR95 did not show any changes during the same period. CR95 had significantly (p<0.05) more total dry biomass after 21 days and 28 days of soil moisture stress while SL28 was consistently the least in both periods. Cat129 had the highest recovery gains in dry root, dry shoot and total dry biomass after 21 days and 28 days of soil moisture stress. The results suggest that CR95 is drought tolerant while Cat129 has the ability to recover quickly from periods of drought distress. The results indicated that initial root biomass was negatively correlated with changes in total fresh and dry biomass of young coffee (r>0.60) after both 21 and 28 days of soil moisture deficit stress, indicating that varieties with the highest initial root biomass have the least changes in total biomass.

ISRN Agronomy pp 1-10, DOI:10.1155/2014/767312
ABSTRACT
A study was carried out to determine the effects of organic, inorganic fertilizers and integrated soil fertility management and irrigation levels (1000 ml, 750 ml and 500 ml per planting station) on coffee growth. There were no significant differences ($p>0.05$) in girth, leaves and primaries due to the different soil fertility management options. Significant differences ($p<0.05$) due to soil nutrient sources were observed in coffee height where inorganic fertilizer treatment resulted in tallest coffee plants (47.4 cm) and integrated soil fertility having the shortest coffee trees (42.8 cm) after one year. The highest irrigation level of 1000ml had the tallest plants with thickest stems while the lowest level had the shortest and thinnest plants ($p<0.05$). No significant differences were observed in number of leaves and primaries due to irrigation treatments. Results indicate that inorganic fertilizers are most effective at high irrigation levels while organic manure perform better than inorganic fertilizers under low irrigation water levels.

100. Approaches to Reinforce Crop Productivity under Water-Limited Conditions in Sub-Humid Environments in Sub-Saharan Africa

Chikowo, R., Zingore, S., Nyamangara, J., Bekunda, M., Messina, J. and Snapp, S.

ABSTRACT
Smallholder farming in much of Sub-Saharan Africa is rain-fed and thus exposed to rainfall variability. Among the climate variables, rainfall is projected to decline and have an overriding effect on crop productivity. With little opportunity for supplementary irrigation for the majority of farmers, a plausible strategy to maintain crop production under water-limited conditions includes balanced nutrient management for enhancing efficiency of use of limited soil water. Co-application of judicious rates of organic and mineral nutrient resources, particularly including the use of phosphorus (P) on P-limited soils, will facilitate development of an extensive crop rooting system for efficient exploration and capture of soil water, especially at a depth >0.8 m. This chapter explores case studies across Eastern and Southern Africa where various soil water conservation and nutrient management approaches have been used to gain ‘extra miles’ with limited available soil water. Firstly, an approach is described that varies nitrogen (N) fertilizer application across growing seasons, by adjusting N application rates to match current season rainfall trends. The approach offers opportunities for farmers to increase crop productivity to >6 t ha\(^{-1}\) in high agro-potential areas, compared to a ceiling of 4.5 t ha\(^{-1}\) for the fixed fertilization model, while minimizing economic losses due to investments in N fertilizer during drought years. Secondly, we deal with the subject of fertilization across nutrient gradients, where a poor agronomic N use efficiency of <18 kg grain kg\(^{-1}\) of applied N is demonstrated for soils with <0.4 % organic carbon, compared with >35 kg grain kg\(^{-1}\) of N applied when soil organic carbon >0.5 %. Thirdly, the conservation agriculture (CA)-nutrient management nexus is examined, where maize yields in farmers’ fields with CA alone were barely 0.5 t ha\(^{-1}\) compared to an average of 2.5 t ha\(^{-1}\) for CA combined with fertilizers. Fourthly, a novel system that involves intercropping two legumes with contrasting phenology for enhanced cropping system functioning is described. Finally, an approach that can be used for co-learning with farmers on soil fertility management principles for risk management is presented. The data lead to the conclusion that the ‘doubled-up’ legumes system results in reduced fertilizer requirements for cereal crops grown in sequence, which benefits yield stability over time. Variable use of N fertilizer according to season quality and more tailored targeting of nutrients are vital for profitable investments in fertilizers in Africa. The Africa RISING project in Eastern and Southern Africa is currently harnessing some of these principles as vehicles for intensification of smallholder farming systems.


ISBN: 978-0-7974-7047-7
Soil Organic Carbon and Nitrogen Stocks along a Seasonal Wetland Transect in Central Zimbabwe

Nyamadzawo, G., Wuta, M., Nyamangara, J. and Nyamugafata, P

ABSTRACT
Ecosystems of central and southern Africa are occupied by some of the largest seasonal wetlands commonly called dambos. Dambos are likely to store huge stocks of soil organic carbon (SOC) because of their saturated conditions. However, most available literature report average SOC concentrations while ignoring pedological and hydrological variations. The objectives of the study were to quantify effects of catena position and hydrology on SOC and nitrogen stocks along a dambo transect in Chiota, Zimbabwe. Soil organic carbon stocks varied significantly with catena and were 7.3, 9.5, 30.4, 2.9 and 7.2 Mg ha$^{-1}$ for upland, margin, middle slope (midslope), lower slope and bottom, respectively, for the 0–40 cm depth. Corresponding nitrogen stocks were 0.6, 0.8, 2.1, 1.1 and 0.7 Mg ha$^{-1}$ for upland, margin, midslope, lower slope and bottom, respectively. The dry-season water table was 8, 1.5, 1.0, 1.3 and 1.5 m, whereas the wet-season water table was 6, 0.5, 0, 0 and 0.9 m below the surface for the upland, margin, midslope, lower slope and bottom, respectively. Biomass stand was highest in the midslope and least in the bottom. It was concluded that SOC and nitrogen stocks varied significantly with catena and this was attributed to differences in wetness.

Key Words: carbon stocks, dambo catena, nitrogen stocks, seasonal wetland.

102. Cattle Manure and Inorganic Fertilizer Application Effects on Soil Hydraulic Properties of Two Soils of Murewa District, Zimbabwe

Dunjana, N, Nyamugafata, P., Nyamangara, J. and Mango, N.

ABSTRACT
This study set out to determine the effects of cattle manure and inorganic N-fertilizer application on the hydraulic properties and maize yield of a clay and sandy soil in a smallholder farming area of Zimbabwe. Four fields classified as homefields (HF: more fertile and closer to homesteads) and outfields (OF: less fertile and further from the homesteads) were selected on clay and sandy soil. They were subjected to four treatments, control (no fertility amendment), 5, 15 and 25 t/ha cattle manure+100 kg/ha N (as ammonium nitrate) for 7 years. A two-way randomized complete block design was used with fertility and field type as the two factors. Clay soil hydraulic properties, which included density of macropores with a diameter >300 µm, unsaturated hydraulic conductivity, steady-state infiltration rate, moisture retention under low suction and maize grain yield, were significantly improved (P<0.05) by fertility management compared with the control and were generally comparable between the HF and OF. Fertility management significantly improved maize grain yield on sandy soils but did not enhance hydraulic parameters, thereby indicating poor responsiveness in structural build-up. On the other hand, significantly different hydraulic parameters between the sandy soil HF and OF suggested effects of other factors not related to soil fertility and field type treatments. We therefore concluded that application of a high rate (25 t/ha) of cattle manure and inorganic N-fertilizer is beneficial for fertility restoration to the degraded OFs with associated comparable hydraulic properties on HFs and OFs on clay soil, unlike on sandy soil.

Key Words: Cattle manure, soil hydraulic properties, maize yield, homefields, outfields, fertility restoration.

Soil Use and Management (DOI: 10.1111/sum.12152). 2014
103. **Influence of Basin-Based Conservation Agriculture on Selected Soil Quality Parameters under Smallholder Farming In Zimbabwe**


**ABSTRACT**

The research was carried out to determine the effect of basin based conservation agriculture (CA) on selected soil quality parameters. Paired plots (0.01 ha) of CA and animal-drawn mould board plough based conventional tillage (CONV) were established between 2004 and 2007 on farmers’ fields on both low clay (12-18 %, sandy loams and sandy clay loams) and high clay (>18-46 %, sandy clays and clays) soils as part of an on-going project promoting CA in six districts in the smallholder farming areas of Zimbabwe. It was hypothesized that CA improves soil organic carbon (SOC), bulk density, aggregate stability, soil moisture retention and infiltration rate. Soil samples for SOC and aggregate stability were taken from 0-15 cm depth and for bulk density and soil moisture retention from 0-5 cm, 5-10 cm and 10-15 cm depths in 2011 from maize plots. Higher SOC contents, SOC stocks and improved aggregate stability, decreased bulk density, increased pore volume and moisture retention were observed for CA treatments. The hypothesis was accepted and it was concluded that CA improves soil quality under smallholder farming. The benefits were however, higher in high clay soils and this has a bearing on targeting the practice in smallholder farming areas of sub-Saharan Africa.

**Key Words:** conservation agriculture; bulk density; aggregate stability; clay content; pore volume; soil organic carbon

*Soil Use and Management (DOI: 10.1111/sum.12149). (IF = 1.968)(2014)
ABSTRACT
There are few direct measurements of anthropogenic climate-forcing emissions in Africa, making it difficult to accurately assess current emissions and to anticipate changes in future emissions. Emissions databases suggest that sub-Saharan Africa (SSA), home to less than 15% of the world’s population, is responsible for 11% of anthropogenic methane (CH4) and 18% of anthropogenic nitrous oxide (N2O) emissions globally, though this includes substantial emissions from biomass burning that would occur in the absence of contemporary anthropogenic activity, and which may be over-estimated. SSA is also an important source of precursors to the greenhouse gas tropospheric ozone, and of mineral dust, which has a range of impacts on climate. Eliminating food insecurity and poverty is likely to take priority over greenhouse gas mitigation in the region, so innovations in mitigation must focus on ways to reduce emissions as an ancillary benefit of improving livelihoods.

Current Opinion in Environmental Sustainability, 10, 65-72. (DOI: 10.1016/j.cosust.2014.07.010) (IF = 3.720)
105. Managing Degraded Soils with Balanced Fertilization in Zimbabwe

Rusinamhodzi, L., Corbeels, M., Zingore, S., Nyamangara, J. and Giller, K.E.

ABSTRACT

Results from a long-term study showed that maize yields on depleted soils were marginally increased with multi-nutrient fertilizer application, while N fertilizer application alone resulted in lower yields on both sandy and clay soils. However, largest maize yields after nine seasons were achieved with cattle manure+fertilizer N application.

Nitrous Oxide and Methane Emissions from Cultivated Seasonal Wetland (Dambo) Soils with Inorganic, Organic and Integrated Nutrient Management


ABSTRACT

In many smallholder farming areas southern Africa, the cultivation of seasonal wetlands (dambos) represent an important adaptation to climate change for smallholder farmers. Frequent droughts and poor performance of rain-fed crops in upland fields have resulted in mounting pressure to cultivated dambos. In cultivated dambos, both organic and inorganic amendments are used to sustain crop yields and these can potentially increase greenhouse gas (GHG) emissions. The objective of the study was to quantify the effects of applying different rates of inorganic nitrogen (N) fertilizers (60, 120, 240 kg N ha\(^{-1}\)) as NH\(_4\)NO\(_3\), organic manures (5, 10 and 15 t ha\(^{-1}\)) and a combination of both sources (integrated management) on GHG emissions in cultivated dambos planted to rape (Brassica napus). Organic manures treatments had nitrous oxide (N\(_2\)O) emissions ranging from 218-894 μg m\(^{-2}\) hr\(^{-1}\), for inorganic N fertilizers emissions ranged from 555 -5186 μg m\(^{-2}\) hr\(^{-1}\), while for integrated nutrient management, emission ranged from 356-2702μg m-2hr-1. Cropped and fertilized dambos were weak sources of methane (CH\(_4\)), and emissions ranged from -0.02-0.9 mg m\(^{-2}\) hr\(^{-1}\). However, the application of manures or integrated management increased carbon dioxide (CO\(_2\)) emissions. We concluded that dambo cultivation increases N\(_2\)O and CO\(_2\) emissions and fertilisation further increases these emissions. Nitrous oxide missions were higher in inorganic N treatments compared to organic manures or integrated nutrient management treatments. Thus, the use of organic manures and integrated nutrient management has potential to mitigate N\(_2\)O emissions, though this can increase CO\(_2\) emissions.

Key Words: Cultivated dambos, greenhouse gas emission, integrated nutrient management, mitigation, rape (Brassica napus)

ABSTRACT
In complex mixed crop-livestock systems with limited resources and biomass scarcity, crop residues play an important but increasingly contested role. This paper focuses on farming systems in the semi-arid areas of Zimbabwe, where biomass production is limited and farmers integrate crop and livestock activities. Conservation Agriculture (CA) is promoted to intensify crop production, emphasizing the retention of surface mulch with crop residues (CR). This paper quantifies the associated potential economic trade-offs and profitability of using residues for soil amendment or as livestock feed, and explores alternative biomass production options. We draw on household surveys, stakeholder feedback, crop, livestock and economic modelling tools. We use the Trade-Off Analysis Model for Multi Dimensional Impact Assessment (TOA-MD) to compare different CR use scenarios at community level and for different farm types: particularly the current base system (cattle grazing of maize residues) and sustainable intensification alternatives based on a CA option (mulching using maize residues ± inorganic fertilizer) and a maize–mucuna (*Mucuna pruriens*) rotation. Our results indicate that a maize–mucuna rotation can reduce trade-offs between CR uses for feed and mulch, providing locally available organic soil enhancement, supplementary feed and a potential source of income. Conservation Agriculture without fertilizer application and at non-subsidized fertilizer prices is not financially viable; whereas with subsidized fertilizer it can benefit half the farm population. The poverty effects of all considered alternative biomass options are however limited; they do not raise income sufficiently to lift farmers out of poverty. Further research is needed to establish the competitiveness of alternative biomass enhancing technologies and the socio-economic processes that can facilitate sustainable intensification of mixed crop-livestock systems, particularly in semi-arid environments.

Key Words: Crop-livestock intensification, Biomass trade-offs, Farm types, Economic impacts, Zimbabwe
The Effects of Catena Positions on Greenhouse Gas Emissions along a Seasonal Wetland (Dambo) Transect in Tropical Zimbabwe


ABSTRACT
Wetlands are major natural sources of greenhouse gases (GHGs). However, most research on GHG emissions has been conducted in temperate wetlands, and there is little data from the tropics, particularly Africa. In central and southern Africa one of the most extensive wetlands are dambos (seasonal wetlands) which occupy 20-25% of land area. There is very little data on GHG emissions from dambos and this study presents the first estimates of methane (CH₄), carbon dioxide (CO₂) and nitrous oxide (N₂O) emissions from dambos in Zimbabwe. The objective was to evaluate the effects of catena positions on GHG emissions along an undisturbed dambo transect. The evaluated catena positions were upland (control), dambo mid-slope and dambo bottom. Methane emissions were 0.3, 29.5 and -1.3 mg m⁻² hr⁻¹, N₂O emission were 40.1, 3.9, and 5.5 µg m⁻² hr⁻¹, while for CO₂ emissions were 2648.9, 896.2, 590.1 mg m⁻² hr⁻¹ for upland, mid-slope and bottom catena, respectively. Aaverage emissions for the upland and dambo were -0.3, 14.1 mg m⁻² hr⁻¹ for CH₄, 26849 and 495 mg m⁻² hr⁻¹ for CO₂, and 40.1 and 4.8 µg m⁻² hr⁻¹ for N₂O. Our results showed that uplands are important sources of N₂O and CO₂, while the dambo mid-slope position is major source of CH₄, but a weak source of CO₂ and N₂O. Dambo bottom catena position was weak source of the three GHGs. We concluded that, depending on catenal position, dambos are important sources and sinks of GHGs.

Key Words: Catena, carbon dioxide, dambo emissions, seasonal wetland (dambo), methane, nitrous oxide.


Shumba, A., Marumbi, R., Nyamasoka, B., Nyamugafata, P, Nyamangara, J. and Madyiwa, S.

ABSTRACT

Nutrient release patterns and heavy metal contamination risks associated with animal manure and organic municipal wastes used as basal fertilisers are largely unknown in Zimbabwe. Carbon, nitrogen and phosphorus mineralisation patterns were determined in a 56-day incubation experiment of domestic sewage sludge (SS), pig (PG), poultry (PM) and cattle manures (CM). Maize biomass production, and nutrient and heavy metal (cadmium, copper, nickel and zinc) uptake were determined in a greenhouse experiment. Inorganic fertiliser, PG, PM, SS and CM were applied to the first maize crop and a second maize crop grown without addition of fertilisers. Aboveground biomass was harvested at four weeks after emergence. Fertiliser treatments had significant (p<0.01) effects on mineralisation. Carbon, nitrogen and phosphorus mineralisation followed the order PG >PM >CM >SS. Maize grown in PM- and PG-amended soils had significantly (p< 0.01) higher biomass, nitrogen and phosphorus uptake than inorganic fertiliser-amended soil in the first crop. The second crop grown in organic fertiliser-amended soils had significantly (p<0.01) higher biomass and nutrient uptake than inorganic fertiliser-amended soil. Heavy metal uptake was highest in SS-amended soils. Poultry and PG manures mineralised faster than SS and CM. Organic fertilisers had more residual fertility. Nickel toxicity is likely when SS is used as a fertiliser.

Key Words: heavy metal uptake, mineralisation, nutrient uptake, organic fertiliser, urban agriculture

ABSTRACT

Seasonal wetland (dambo) cultivation in smallholder farming areas is important because it improves household food security. However, most farming practices, such as burning of vegetation and conventional tillage in dambo gardens, may reduce soil organic carbon (SOC) and nutrient dynamics. We evaluated the effects of simulated burning, vegetation clearing and clipping, and conventional tillage in dambo gardens on SOC, nutrient contents and biomass production over a 3-year period. The results showed that clearing and clipping of vegetation and conventional tillage reduced SOC, soil nutrient contents and biomass yields, while burning increased SOC and soil nutrient contents. For the 0-10 cm depth, conventional tillage, clearing and clipping resulted in a 37%, 34% and 18% decrease in SOC, respectively, after three seasons, burning resulted in a 25% increase in SOC, while there were no changes in the control after 3 years. For the 0–40 cm depth, the average change in SOC was 32%, 25% and 16% for conventional tillage, clearing and clipping, respectively. Locally and regionally, conventional tillage, clearing and clipping reduce SOC, nutrient contents and biomass production in dambos. Though annual burning increased SOC and nutrient contents in the short term, the long-term effects are uncertain, hence there is a need for long-term studies.

Key Words: Dambo (seasonal wetland), conventional tillage, soil organic carbon, nutrient contents, biomass removal

Archives of Agronomy and Soil Science, 60, 1411-1427 (DOI: 10.1080/03650340.2014.892583). (IF = 0.515) (2014)
Nitrous Oxide Emissions from Wetland Soil Amended With Inorganic and Organic Fertilizers


ABSTRACT
Agricultural soils are a primary source of anthropogenic trace gas emissions, and the subtropics contribute greatly, particularly since 51% of world soils are in these climate zones. A field experiment was carried out in an ephemeral wetland in central Zimbabwe in order to determine the effect of cattle manure (1.36% N) and mineral N fertilizer (ammonium nitrate, 34.5% N) application on N2O fluxes from soil. Combined applications of 0 kg N fertilizer + 0 Mg cattle manure ha$^{-1}$ (control), 100 kg N fertilizer + 15 Mg manure ha$^{-1}$ and 200 kg N fertilizer + 30 Mg manure ha$^{-1}$ constituted the three treatments arranged in a randomized complete block design with four replications. Tomato and rape crops were grown in rotation over a period of two seasons. Emissions of N2O were sampled using the static chamber technique. Increasing N fertilizer and manure application rates from low to high rates increased the N2O fluxes by 37–106%. When low and high rates were applied to the tomato and rape crops, 0.51%, 0.40%, and 0.93%, 0.64% of applied N was lost as N$_2$O, respectively. This implies that rape production has a greater N$_2$O emitting potential than the production of tomatoes in wetlands.

Key Words: manure, fertilizer, N$_2$O, emission, wetland

Archives of Agronomy and Soil Science, 60, 1363-1387 (DOI: 10.1080/03650340.2014.890707). (IF = 0.515) (2014)
The Impact of Tillage System and Herbicides on Weed Density, Diversity and Yield of Cotton (Gossypium Hirsutum L.) and Maize (Zea Mays L.) under Smallholder Sector


ABSTRACT
The study was carried out to evaluate the impact of tillage system in combination with different herbicides on weed density, diversity, crop growth and yields on 18 farms in Kadoma, Zimbabwe. Experiments were set up as a split plot design with three replications on each farm. Tillage was the main plot (Conservation Tillage (CT), Conventional Tillage (CONV)) and weeding option (hand weeding, cyanazine, atrazine, glyphosate only and mixture of cyanazine+ alachlor and atrazine+alachlor) as the sub-plots. Due to the heterogeneous nature of farmers’resource base, the farms were grouped into three farm types: high (Type 1), medium (Type 2) and poorly resourced farmers (Type 3). The hand hoe weeded treatments had 49 percent higher total weed densities in CT relative to CONV, and was statistically similar to the glyphosate treatment. The mixed pre-emergence herbicides reduced the diversity indices by 69 and 70 percent when compared to the hand hoe weeded treatment under CT in cotton and maize, respectively. The effectiveness of all pre-emergence herbicides were not influenced by tillage but were affected by farmers resource endowments with pronounced effect in Farm Type 1. Maximum plant heights of 85 and 238 cm were recorded for mixed pre-emergence herbicides under CT for cotton and maize, respectively. Minimum plant heights of 75 and 217 cm were recorded for the respective hand hoe weeded treatments. The hand hoe weeded treatments resulted in average cotton lint yield of 1497 and 2018 kg ha⁻¹ for maize. The mixed pre-emergence herbicides treatments gave yields of 2138 and 2356 kg ha⁻¹ of cotton and maize, respectively. The higher weed densities in CT under hand weeded treatments underscored the need for other weeding options. Similarly, a mixture of cyanazine+alachlor in cotton and atrazine+alachlor in maize is recommended for suppressing broad and grass weed populations and enhancing yields in CT systems.

Key Words: Weeding system, conservation tillage, cyanazine, atrazine, maize, cotton

113. Soil and Forest Floor Carbon and Nitrogen over an Age Sequence of Pinus Patula Plantations in Zimbabwean Eastern Highlands

Mujuru, L., Gotora, T., Velthorst E.J., Nyamangara, J. and Hoosbeek, M.R.

ABSTRACT
Forests play a major role in regulating the rate of increase of global atmospheric carbon dioxide (CO₂) concentrations creating a need to investigate the ability of exotic plantations to sequester atmospheric CO₂. This study examined pine plantations located in the Eastern Highlands of Zimbabwe relative to carbon (C) and nitrogen (N) storage along an age series. Samples of stand characteristics, forest floor (L, F and H) and 0–10, 10–30 and 30–60 cm soil depth were randomly taken from replicated stands in Pinus patula Schiede & Deppe of 1, 10, 20, 25, and 30 years plus two natural forests. Sodium polytungstate (density 1.6 g cm⁻³) was used to isolate organic matter into free light fraction (fLF), occluded light fraction (oLF) and mineral associated heavy fraction (MaHF). In both natural and planted forests, above ground tree biomass was the major ecosystem C pool followed by forest floor’s humus (H) layer in addition to the 45%, 31% and 24% of SOC contributed by the 0–10, 10–30 and 30–60 cm soil depths respectively. Stand age caused significant differences in total organic C and N stocks. Carbon and N declined initially soon after establishment but recovered rapidly at 10 years, after which it declined following silvicultural operations (thinning and pruning) and recovered again by 25 years. Soil C and N stocks were highest in moist forest (18.3 kg C m⁻² and 0.66 kg of N m⁻²) and lowest in the miombo (8.5 kg m⁻² of C and 0.22 kg of N m⁻²). Average soil C among Pinus stands was 11.4 kg of C m⁻², being highest at 10 years (13.7 of C kgm²) and lowest at 1 year (9.9 kg of C m⁻²). Some inputs of charcoal through bioturbation over the 25 year period contributed to stabilisation of soil organic carbon (SOC) and its depth distribution compared to the one year old stands. Nitrogen was highest at 10 years (0.85 kg of N m⁻²) and least at 30 years (0.22 kg of N m⁻²). Carbon and N in density fractions showed the 20 year old stand having similar proportions of fLF and oLF while the rest had significantly higher fLF than oLF. The contribution of fLF C, oLF C and MaHF C to SOC was 8–13%, 1–7% and 90–91% respectively. Carbon and N in all fractions decreased with depth. The mineral associated C was significantly affected by stand age whilst the fLF and oLF were not. Conversion of depleted miombo woodlands to pine plantations yield better C gains in the short and long run whilst moist forest provide both carbon and biodiversity. Our results highlight the importance of considering forestry age based C pools in estimating C sink potential over a rotation and the possibility of considering conservation of existing natural forests as part of future REDD + projects.

Key Words: Soil organic matter fractions, Forest floor, C: N ratios, plantation forestry, Carbon

ABSTRACT
Most smallholder farming areas of Zimbabwe have low soil fertility and low rainfall, which has continually decreased over the past years. In recent years, most of the smallholders farming areas have experienced perennial droughts, poor rainfall distribution and crop failures and these have been attributed to climate change and variability. Cultivation of dambos, which are seasonal wetlands, presents a climate change and variability adaptation option for smallholder farmers. This synthesis analyses the role of dambo cultivation in climate change and variability adaptation and discusses future directions for sustainable dambo utilization. The data on current dambo farming practices were collected from literature, surveys and field observations. The results showed that farmers grow crops in dambos as an adaptive strategy to climate change and variability and have largely abandoned upland fields where yields are, 1 t ha$^{-1}$ in preference of dambos where yields average 2–3 t ha$^{-1}$. Dambo cultivation offers a buffer against crop failures and has resulted in improved household food security. We conclude that dambo cultivation is a potentially beneficial farmer-driven climate change and variability adaptation strategy. However, if not properly designed and managed, dambo cultivation may result in their degradation hence there is need for further research to evaluate options for sustainable dambo utilization as intensification of dambo agriculture is important for food security.

Key Words: climate change, dambos, cultivation, household food security, climate smart agriculture

ABSTRACT
Globally a range of agronomic factors have been reported to have an impact on the performance of Conservation Agriculture (CA) and often determine its performance in relation to conventional agriculture (CONV). To assess this performance for the semi-arid areas of Zimbabwe forty-eight CA experiments were conducted by ICRISAT in the semi-arid areas of southern Zimbabwe from 2004 – 2010, to calculate the weighted mean difference (WMD) through meta analytical methods. The two CA practices, planting basins (Basins) and ripper tillage (Ripper) were compared to CONV. It was hypothesized that CA results improved yield compared to CONV, and that the effect of CA practices on yield is affected by soil type, rainfall amount and distribution and selected management practices that included rates of inorganic fertilizers and manures and mulching. Basins were superior to CONV in 59 % of the experiments and the overall effect was significant (p < 0.001). The effect of Ripper was non-significant. The hypothesis that CA practices result in improved maize grain yield over CONV was accepted for Basins. The WMD for experiments conducted on sandy soils was 0.365 t ha$^{-1}$ for Basins and 0.184 t ha$^{-1}$ for Ripper and in both cases was significant (p < 0.05). For clay soils, only the WMD for Basins was significant. A higher rainfall regime (500-830 mm) resulted in a lower WMD for Basins (0.095 t ha$^{-1}$) and Ripper (0.105 t ha$^{-1}$) compared with 0.151 t ha$^{-1}$ for Basins and 0.110 t ha$^{-1}$ for Ripper under lower rainfall (320-500 mm). The overall effect of Basins under the higher rainfall regime was not significant. There was better yield performance for Basins when the rainfall was well distributed; the reverse was noted for the Ripper. The application of 10-30 kg ha$^{-1}$ of N (micro dose range) resulted in a higher WMD for Basins compared to zero N application. Without N application the WMD of Basins was not significant. For zero manure application in Basins, the WMD was 0.043 t ha$^{-1}$ compared to 0.159 t ha$^{-1}$ when manure was applied. The application of mulch depressed the WMD in Basins by 44 % and Ripper by 89 %. The hypothesis that yield performance under CA is influenced by soil type, rainfall amount and distribution, inorganic fertilizer and manure application was accepted.

Key Words: Conservation Agriculture, N fertilizer, rainfall distribution, soil type

Experimental Agriculture, 50 (2), 159-177 (DOI: 10.1017/S0014479713000562). (IF = 1.069)(2014)
116. “Resonance Raman Determination of Vinyl Group Disposition in Different Derivatives of Native Myoglobin and Its Heme-Disoriented Form”

Rwere, F., Mak, P. J., and Kincaid, J. R.

ABSTRACT
In heme-reconstituted heme proteins, the heme inserts such that some of the heme is rotated 180° about the α-γ meso axis, eventually equilibrating to native conformations. Also, proteins from different species may naturally possess both conformers. Resonance Raman (RR) spectroscopy is effective in signaling this conformational heterogeneity, detecting altered interactions with active site residues. While shifts of the vibrational modes of the two vinyl groups could be readily detected, they couldn’t be assigned to a particular vinyl group. This deficiency is alleviated by employing a specifically labeled protoheme isotopomer, wherein only the 4-vinyl group is labeled (i.e., -CH=CD₂), providing a spectral editing mechanism for selectively tracking the individual vinyl groups. The RR spectral data acquired here for the met-, deoxy- and ferrous CO adduct of myoglobin, along with their “flipped heme” isomers, provide convincing evidence for the anticipated effects of “swapping” the environments of the two vinyl groups; i.e., in the native form, the 2-vinyl group assumes an out-of-plane orientation with respect to the pyrrole plane than does the (nearly in-plane) 4-vinyl group, whereas in the “reversed” orientation the 4-vinyl group now assumes a position that is more out-of-plane than the newly positioned 2-vinyl group. The ability of RR spectroscopy to document such differences in the orientation of the vinyl substituents is made important by the fact that changes in the disposition of these groups has long been known to carry functional consequences.

Journal of Raman Spectroscopy, 45, 97-104. (2014)
ABSTRACT

The structural basis of the regulation of microsomal cytochrome P450 (P450) activity was investigated by mutating the highly conserved heme binding motif residue, Phe429, on the proximal side of cytochrome P450 2B4 to a histidine. Spectroscopic, pre-steady-state and steady-state kinetic, thermodynamic, theoretical, and structural studies of the mutant demonstrate that formation of an H-bond between His429 and the unbonded electron pair of the Cys436 axial thiolate significantly alters the properties of the enzyme. The mutant lost >90% of its activity; its redox potential was increased by 87 mV, and the half-life of the oxyferrous mutant was increased ~37-fold. Single-crystal electronic absorption and resonance Raman spectroscopy demonstrated that the mutant was reduced by a small dose of X-ray photons. The structure revealed that the δN atom of His429 forms an H-bond with the axial Cys436 thiolate whereas the εN atom forms an H-bond with the solvent and the side chain of Gln357. The amide of Gly438 forms the only other H-bond to the tetrahedral thiolate. Theoretical quantification of the histidine-thiolate interaction demonstrates a significant electron withdrawing effect on the heme iron. Comparisons of structures of class I-IV P450s demonstrate that either a phenylalanine or tryptophan is often found at the location corresponding to Phe429. Depending on the structure of the distal pocket heme, the residue at this location may or may not regulate the thermodynamic properties of the P450. Regardless, this residue appears to protect the thiolate from solvent, oxidation, protonations, and other deleterious reactions.

Biochemistry, 53, 5080-5091. (2014)
118. Room Temperature Elastic Properties of Rh-Based Alloys Studied by Surface Brillouin Scattering

Sumanya C., Mathe B.A, Comins J.D, and A. G. Every,, M. Osawa, and H. Harada

ABSTRACT

Platinum metal group alloys are promising materials for use in a new generation of gas turbine engines owing to their excellent high-temperature properties. In the present work, room temperature elastic properties of single crystals of Rh$_3$Nb and Rh$_3$Zr are investigated. Surface Brillouin scattering spectra for a range of wave vector directions on the (001) surface have been acquired in order to determine the angular variation of the velocities of the Rayleighand pseudo-surface acoustic waves and that of the longitudinal lateral wave (LLW) threshold within the Lamb shoulder. The elastic stiffness constants $C_{11}$, $C_{12}$ and $C_{44}$ of these cubic crystal specimens have been derived using two approaches; the first involving the least-squares fit of the combined measured wave velocity data to calculated values and the second an analytical approach using the Rayleigh velocities in the [100] and [110] directions and LLW velocity in the [100] direction, and extracting the elastic constants from the secular equations for these velocities. Results from the two methods are in good agreement and are: for Rh$_3$Nb, $C_{11}=368\pm3$. $C_{12}=186\pm5$ and $C_{44}=161\pm3$ in GPa, and for Rh$_3$Zr, $C_{11}=329\pm4$. $C_{12}=185\pm6$ and $C_{44}=145\pm4$ in GPa.

ABSTRACT

Small surface reservoirs play an important role of providing ready and convenient source of water for various uses in semi-arid areas which are characterized by erratic and low rainfall. Lack of current data on reservoir capacity loss due to sedimentation is one of the challenges to the sustainable management of surface reservoirs. The study investigated the capacity loss due to sedimentation from 2000-2012, and estimated the trap efficiency of the Mutangi reservoir which is located in semi-arid Chivi, Southern of Zimbabwe. Hydrographic surveys, grab sampling and water depth-capacity methods were used to determine the capacity of the dam as of 2012. To compute capacity loss from 2000 to 2012, the 2000 and 2012 dam capacities were compared whilst the trap efficiency of the reservoir was determined using a set of empirical models that relates trap efficiency to the capacity-watershed area ratio and capacity-inflow ratio. The results show that Mutangi reservoir has a trap efficiency of 95% - 98% (av = 96.4%) and has lost 37% of its capacity due to sedimentation in 12 years (2000 and 2012). Rates of sedimentation were 8539 t·yr$^{-1}$, 9110 t·yr$^{-1}$ and 8265 t·yr$^{-1}$ for the hydrographic survey, grab sampling and water depth-capacity method respectively, and the little difference in these figures demonstrates that any method can be used to determine sedimentation rates. The area specific sediment yield (ASY) ranged from 14 - 15.5 t·ha$^{-1}$·yr$^{-1}$ (av = 14.956 t·ha$^{-1}$·yr$^{-1}$). At the current rate of sedimentation the projected dead level of the reservoir will be lost to sedimentation in 8 years while the useful life of the reservoir is estimated to be 30 years. Capacity loss due to sedimentation is further complicating the already strained water scarcity situation in semi-arid areas and management decisions should be made based on the current sedimentation rates estimated by different methods. These results imply that management practices that reduce erosion, hence sedimentation in these small reservoirs should be practiced in order to prolong their lifespan.

Key Words: Hydrographic Survey, Sedimentation, Semi-Arid Area, Small Reservoir, Water Resources

120. Carving a Niche for the Social Sciences in Transdisciplinary Research on Climate Change Adaptation in Southern African Agriculture

Mubaya, C.P, Mugabe, F.T, and Walker, S

ABSTRACT
This article describes and analyses challenges and opportunities for social science research based on a transdisciplinary research and development project on climate change adaptation in the agriculture sector in Zimbabwe and Zambia. The project incorporated a social science component based on the finding that research on climate change has mainly focused on biophysical and hydrological issues, while little attention has been paid to socio-economic issues. We present the role of the social sciences in transdisciplinary research, the successes and constraints of the research process and activities, as well as the emerging local socio-economic issues and how they are linked to findings from other research types conducted in the context of this project. The article concludes that employing a social science lens in understanding risk perceptions and subsequent adaptations is important for strengthening innovations and innovation systems that improve farmer livelihoods. We thus recommend considering social sciences as an approach that examines horizontal phenomena and explores the challenges of environmental change and innovative research dimensions.

Key Words: Transdisciplinarity, Social sciences, Research methods, Participatory rural appraisal, Vulnerability, Climate change adaptation

B. Werlen (ed.), Global Sustainability, Cultural Perspectives and Challenges for Transdisciplinary Integrated Research. Springer International Publishing Switzerland 2015 DOI 10.1007/978-3-319-16477-9_6
Engaging Smallholder Farmers with Seasonal Climate Forecasts for Sustainable Crop Production in the Semi-Arid Areas of Zimbabwe


ABSTRACT
Small holder farmers in the semi-arid areas have not been able to utilize seasonal climate forecasts in making crop management decisions due to limited exposure as well as failure to interpret it. Three participatory meetings were held with farmers in Lower Gweru and Lupane districts of Zimbabwe soon after the release of the 2008/09 and 2009/10 seasonal climate forecast in September of each season. This was done to solicit for farmers’ prediction of the coming rainy season and come up with field test crop management practices. Farmers have their sets of indicators that they rely on to forecast seasonal rainfall which are based on generations of past experience that include environmental, biological, and traditional beliefs. There is however need to investigate how their indicators compare with the scientific forecast in making farming decisions. Farmers claimed that the rains were starting later and finishing earlier whilst analysis of the rainfall record showed that starting rains have been later by 5 to 10 days in the last five years. There was an increase in the number of dry spells in the rainy season in the last five years compared to the period 1980 to 2008. Adding recommended amounts of fertilizers resulted in yield increases of 40% compared to adding half the recommended amounts. Growing long season varieties resulted in higher yields (22%) than growing short season varieties in the 2009/10 wetter season while growing of shorter season variety had yield advantage (36%) over the long season variety in the 2009/10 which was relatively dry. Frequent weeding resulted in about 8% increase in maize yields compared to weeding once in a season. The study demonstrates that knowledge of the coming season assists smallholder farmers in coming up with adaptive strategies for climate variability and change.

Key Words: seasonal climate forecast, agriculture, smallholder farmers, adaptation, semi-arid areas


Jingura R.M., and Kamusoko R

ABSTRACT

Jatropha is largely a semi-wild plant under domestication. There is wide variation in morphological and agro-nomic traits of Jatropha. There are several endeavours to improve the genetic quality of Jatropha. Various seed yield ranges have been reported for Jatropha, for example, 0.4 – 12 t ha\(^{-1}\). Proper identification and characterisation of the plant's germplasm is central in genetic improvement of the plant. This paper evaluates the utility of markers for determination of genetic diversity in Jatropha. Several marker techniques are available for genetic characterisation of Jatropha. These include morphological and DNA-based markers. DNA-based markers such as RAPD, AFLP, RFLP, SSR and ISSR have been applied in evaluation of genetic diversity in Jatropha. Each of these techniques has its own advantages and limitations that determine its applicability in plant genetic diversity studies. This paper recommends application of a combination of markers as a reliable approach for determination of intra-specific genetic diversity in Jatropha.

Key Words: Accessions, DNA-based markers, germplasm, isozymes, morphological markers.

Experiences with *Jatropha* Cultivation in Sub-Saharan Africa: Lessons for the Next Phase of Development

Jingura R.M and Kamusoko R

**ABSTRACT**

*Jatropha curcas L.* has emerged in recent times as a leading energy crop in sub-Saharan Africa with over 32 countries in the region involved in its production. The establishment of *Jatropha* has not been without challenges and has arguably been driven by crop-suitability factors that have been put to test in the last decade. The objective of this paper is to provide an analysis of the performance of *Jatropha* as an energy crop, benchmarking on the plant’s acclaimed attributes. The paper analyses information originating from sub-Saharan Africa and examines the performance of the crop. The results show that current agronomic practices and performance levels of *Jatropha* in terms of seed yield (< 1 t/ha<sup>-1</sup>) are inadequate and unlikely to lead to production of sufficient quantities of seed for biodiesel production. Not enough has been done in the region in terms of research and use of information extrapolated from other environments has not been adequate. The conclusion is that much work still needs to be done in terms of developing suitable germplasm and agronomic practices for *Jatropha*.

**Key Words:** agronomic practices, crop performance, seed yield, *Jatropha*, seed yield, sub-Saharan Africa


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Mutungwe E., Tsvere M., Munikwa S., Dondo B., Pedzisai C

ABSTRACT

This paper reports on a baseline study on the level of awareness and practices of solid waste management in Chinhoyi urban. The study was motivated by the high levels of solid waste in the Chinhoyi urban community. The study collected data through questionnaires and interviews from a random sample of 315 residents. Findings show that the majority of people in the Chinhoyi urban community did not take solid waste disposal as their responsibility but that of the municipality. Hence they were not doing much to help the situation. Some communities had a negative attitude towards the whole concept while a few were very supportive and willing to engage in activities that promote behaviour change on solid waste disposal.

Key Words: Solid waste management, Community engagement.

Narrow row planting has potential to increase crop growth and yield by increasing radiation interception (RI) and minimizing intra-specific competition in the crop. It reduces weed growth and competitiveness, making resources that are normally taken up by weeds available for crop uptake. The objective of this study was to assess the effect of row spacing on weed biomass, bean growth and yield in a semi arid agro-ecology at Nyagatare, Rwanda. The study was set up as a randomized complete block design in October–December 2009 and repeated in 2011. Planting patterns at a constant bean population density of 111 000 plants ha$^{-1}$ random planting (normal practice), narrow row planting (30 cm × 30 cm), medium row planting (45 cm × 20 cm) and wide row planting (60 cm × 15 cm) were treatments tested in this study. The narrow row square planting pattern significantly (P < 0.01) out-yielded the wide and random planting patterns by 22–31% in the wet 2009 season and by 27–70% in the dry 2011 season. Bean plant dry weight (P < 0.01) and number of pods per plant (P < 0.01) was highest in the narrow row and lowest in the random planting pattern in the dry 2011 season. Bean plant dry weight was not significantly affected (P > 0.05) in the wet 2009 season but number of pods plant$^{-1}$ (P < 0.001) was highest in the narrow row and lowest in the random planting pattern. Weed biomass was significantly lower (P < 0.05) in the narrow row than in the medium and wide row planting patterns at 3, 6 and 9 weeks after emergence in 2009, but the random planting had the highest weed biomass in 2011. The results suggest that the effects narrow row planting in alleviating the negative impact of inter- and intra-specific competition were more strongly expressed in the dry 2011 season than the wet 2009 season when water was probably not a limiting factor to crop growth and yield. The results also indicate that narrow and equidistant planting has potential to increase bean yield by 30%–70%, when compared to random planting (normal practice) while at the same time suppressing weed growth and is recommended for smallholder farmers in Rwanda and other semi-arid areas in sub-Saharan Africa.

**Key Words:** Row spacing, Bean growth, Bean yield, Weed biomass

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Full Length Article


Mudatenguha F., Anena J., Kiptum C.K., and Mashingaidze A.B

ABSTRACT

Abstract Droughts, short growing seasons and poorly distributed rainfall are major constraints to maize production in eastern semi-arid region of Rwanda. In situ rain water harvesting offers an alternative option to reduce rainwater runoff, increase infiltration and storage of water in soil and reduce the effects of drought stress on maize grain yield. The objective of the study was to assess the effects of in situ water harvesting techniques on soil moisture content, maize growth and grain yield in Nyagatare, Rwanda in the 2011-2012 seasons. The study comprised of four treatments: pot holing, tied-ridging and mulching compared to control treatment of planting on the flat. The experimental design was randomized complete block with three replicates. Soil moisture content and maize plant dry weight were measured at 8, 11 and 14 weeks after emergence (WAE). There was a significant increase (P<0.001) in soil moisture content and maize plant dry weight from planting on the flat (control), pot hole, tied ridges to mulching at 8, 11 and 14 WAE. Yield components (ear mass, number of grains per ear and 100 grain weight) and grain yield significantly increased (P<0.001) from planting on the flat, pot holes, tied ridges and were highest in the mulched treatment. Maize grain yield increased (P<0.001) by 49.6, 103 and 136% of the maize grain yield harvested from the flat planting (1593.36 kg ha\(^{-1}\)) in the pot-holing, tied ridging and mulching treatments, respectively. The results of this study indicate that mulching, tied ridges and pot holes, in decreasing order of effectiveness, have potential to increase soil moisture content and reduce the damage caused by drought stress to maize growth and grain yield and therefore recommended for farmers in Nyagatare and other drought prone regions.

International Journal of Agriculture and Biology (2014)
School Of Art and Design

127. Adam Madebe’s Ploughman and the Politics Land Struggles in Zimbabwe.

Samwanda, B and Schmahmann, B

ABSTRACT

Adam Madebe’s Ploughman (1992) is mounted on a storey-high pedestal outside Hurudza House, the head office of Agribank, in Harare in Zimbabwe. Interpreting Ploughman in the context of land struggles in Zimbabwe, we suggest that the sculpture is imbued with associations that were the outcome of historical factors that saw African men being estranged from the land and African women’s burdens as well as disempowerment simultaneously increasing. Referring implicitly to ideas about the peasant as a ‘child of the soil’, the sculpture lent itself to being read in the 1990s in light of a concept that a rural farmer enjoys psychic and ancestral – rather than purely economic – ties to the land, and as the sign of a commitment on the part of the Zimbabwean government to redress losses experienced through colonialism. As a representation of a generic farmer rather than a portrayal of a specific individual, Ploughman is also open in meaning, and its significance for many has shifted in the more than two decades since it was placed in the public domain. While beneficiaries of the Fast Track Land Reform Programme at the turn of the new millennium may continue to view the work as a manifestation of ideas about a child of the soil, those women agriculturalists who still do not own land may well view it as a sign of their on going marginalisation, while for people who were violently displaced from farms or who were dispossessed of their livelihoods through the so-called Third Chimurenga, the sculpture would surely be a signifier of trauma and loss.

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Department Of Research and Specialist Services

Coffee Research Institute
Abstracts for completed and on-going research projects for 2014-15 Zimbabwe research Index

Agronomy Section

128. The Effect of Planting Hole Size and Method of Mulching On Moisture Conservation, Growth, Yield and Quality of Coffee.

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ABSTRACT
Moisture stress presents one of the most critical challenges to coffee productivity as it paralyses the entire physiology of the plant. Vegetative growth occurs mainly during the rainy season, while fruit growth continues well into the dry season, thereby necessitating the need for supplementary water. The cost of establishing and maintaining an efficient irrigation system is beyond the scope of most smallholder coffee farmers. A trial was established at Coffee Research Institute to investigate the effect of planting hole size and method of mulching on moisture conservation, growth, yield and quality of coffee. The 4x3 factorial experiment was laid in a Randomized Complete Block Design. Planting hole size had four treatments (dimensionless hole, 45cmx45cmx45cm, 60cmx45cmx45cm, trenchx45cmx45cm) and mulching method had three treatments which were; zero, basin and complete mulching. Differences in hole sizes and mulching method did not confer significant (p>0.05) growth (height, girth), yield and quality advantages to coffee. Basin mulching showed relatively more days (4) to 25% soil moisture depletion and provided more financial returns. The experiment was started in 2008 and ends in December 2015.

Key Words: Coffee, Hole size, Moisture stress, physiology, mulching, coffee
129. Coffee Varietal Evaluation of Two Indian Hybrids under Zimbabwean Field Conditions

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ABSTRACT

Trials to evaluate the performance of two Indian coffee hybrids (Selection 5A and 6) under different Zimbabwean field conditions were established in 2009, against four locally adapted coffee varieties (Catimor 129, Catimor F6, SL28 and K7 (K7 is only at CoRI). The experiments were set up in a randomized complete block design with three replications (Four replications at CoRI). Growth (height (cm), girth (mm) and number of primary branches) measurements were taken from three central plants in each plot. There were significant differences in all growth parameters across coffee varieties and different coffee growing regions. The two Indian hybrids (Selections 5A & 6) dominated locally adapted varieties on height, but were outperformed at most sites on girth, number of primary branches and number of flowering primaries. The GGE biplots showed that Catimor 129 & Catimor F6 performed better than average in all environments except at Mutembedzi farm. SL28 had better than average performance at Mutembedzi, but poorer than average at all the other sites. Selections 5A and 6 had poorer than average performance in yield at all sites. CoRI was the most informative site. Catimor 129 was the highest yielder at all sites. The Indian Hybrids compared very well with local varieties on quality.

Key Words: Indian hybrids, growth, yield, environment, GGE biplot
Evaluation of Indaziflam (Alion) 500SC for Control of Weeds in Coffee

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**ABSTRACT**

Crop yield losses due to weed adverse effects can be as high as 50%. The use of herbicides simplifies weed management in situations of labor shortage and during rainy periods. Indaziflam (Alion) was tested for efficacy as a new pre- and post-emergence herbicide using three different rates (120ml/ha, 150ml/ha, 200ml/ha) against the standard rate of Metalachlor of 1500ml/ha for the control of grasses and broad leaf weeds in coffee at Coffee Research Institute, Chipinge. The trial was laid out in a Randomized Complete Block Design. Herbicide efficacy was recorded weekly based on the standard EU weed assessment scale (scores of 1 – 9 where a score of 1 = 100% weed kill and 0% weed cover; score of 9 = 0-33% weed kill and 67-100% weed cover). Alion has great potential as a pre and early post-emergence herbicide for controlling weeds in coffee as it was very effective against notorious broadleaf weeds at all studied rates, posting 90 to 100% weed kill. Alion showed comparable efficacy to the standard chemical but applied at lower concentrations, therefore it proffers considerable advantage in reducing health, environmental and production costs for the farmer. The trial commenced in the 2013, was repeated in 2014, and will continue in 2015.

**Key Words:** Weeds, Herbicide, efficacy, pre-emergence, post-emergence, broadleaf
131. Determining the Appropriate Composting Time for Coffee Pulp for Use as Organic Manure

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ABSTRACT

Recycling coffee pulp and other wastes is an important requirement for many certification standards. The coffee pulp composting time trial is aimed at establishing the optimum coffee pulp composting time for appropriate coffee waste management and minimization of inorganic fertilizer use through integrated soil fertility management. The trial was laid out in a randomized complete block design with three replications at Coffee Research Institute, Chipinge. Coffee pulp was composted for 2, 3, 4, 5 and 6 months. Growth (height, girth, dry matter and number of primary branches) measurements were taken from three plants in each treatment. Results showed that different composting times did not result in significant (p>0.05) differences in plant height, girth and primary branches. The trial started in 2012 and ends in 2015.

Key Words: Composting time, coffee pulp, sustainability, certification standards, pot
Evaluating the Role of In-Field Rain Water Harvesting Methods on Soil Moisture Conservation for Coffee Growth and Yield

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ABSTRACT
Water supply and management are pre-requisites for successful coffee production, mostly in the dry season. A study was carried out at Coffee Research Institute, Chipinge, to evaluate the effects of in-field water conservation strategies on coffee growth and yield. The treatments included three variations in ditch placement (up-slope, in row, centered) and a control with no ditch. Preliminary results have shown no significant differences \( (p>0.05) \) on the number of primaries and yield, but significant differences \( (p<0.05) \) were found in coffee stem thickness. The control had the thickest stems. The trial will continue until 2016.

Key Words: Coffee, in-field, moisture conservation, dry season, ditch placement
133. Effect of Seedling Transplanting Time on Coffee Growth and Yield

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ABSTRACT
Establishment of optimum coffee seedling transplanting time can go a long way in improving agronomic practices and production cost reduction. A trial to find the optimum transplanting time was laid out in a randomized complete block design with four replicates at Coffee Research Institute, Chipinge. Growth (height, girth, number of primary branches) and yield measurements were taken and the data was analysed using Genstat 14th edition. There were highly significant \( p<0.001 \) differences in all the variables of interest due to transplanting time with September plantings exhibiting the tallest, thickest and most number of primary branches in the first year and March plantings performing the least in all measured aspects. The experiment commenced in the year 2013 and is expected to last for nine years.

Key Words: Transplanting time, coffee, yield, agronomic practices, cost reduction
Effect of Seedling Transplanting Age on the Performance of Coffee in the Field

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ABSTRACT

Coffee seedlings are transplanted into the field at different ages on different coffee farms in Zimbabwe and in different parts of the world. Advantages and disadvantages have been cited for transplanting coffee at different ages. However, there is very little scientific evidence to substantiate some of the claims by different farmers. To determine the effect of seedling transplanting age on the growth and yield of coffee, a trial was set up at Coffee Research Institute in a randomized complete block design with three treatments replicated three times. Growth (number of primary branches, girth measured at 5cm from ground by Vernier Calipers, height measured by a metre rule from soil surface to the tip of the apical meristem, days to first flowering) and yield (kg/ha) measurements were taken. Coffee yield would be recorded once a year by collating monthly harvest totals for the season. Catimor 129 is being used as the test variety. Preliminary results have so far shown no significant difference \((p<0.05)\) in growth and number of days to first flowering due to coffee seedling transplanting age. The trial was established in 2014 and will be completed in 2022.

Key Words: Coffee, Seedling, Transplanting age, Growth, Yield, Costs
Entomology Section

135. Evaluation of Thunder 480SC (Imidacloprid-G/L+Beta-Cyfluthrin100g/L) For Its Efficacy against Stink Bug in Macadamia (Macadamia Tetraphylla/ M. Integrifolia)

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ABSTRACT
A field trial was conducted at Makandi Tea and Coffee Estates, Chipinge in 2013 and 2014 to evaluate Thunder 480SC (Imidacloprid-g/l+Beta-cyfluthrin/l), for its efficacy in the control of Stink bugs in Macadamia nuts. The trial was laid out in a Randomized Complete Block Design (CRBD) with four treatments replicated four times. The treatments were; Thunder at 10ml, 15ml, and 20ml in 100litres of water, and Chlopyrifos as the standard. Results showed no significant differences in Stink bug mortality due to treatments for two consecutive seasons, 2013 and 2014 \((p>0.05)\). Thunder at concentrations of 10, 15 and 20ml/100litres of water was comparable to the standard chemical, Chlorpyrifos, in controlling Stink bugs in Macadamia. The fact that Thunder at lower concentrations gave comparable control to the standard chemical indicates that Thunder is a suitable alternative to Chlorpyrifos which is currently being phased out due to health and environmental concerns. Study was completed in 2014.

Key Words: Stink bug, Thunder, environmental hazard, macadamia, control
Evaluation of Thunder 480SC (Imidacloprid-G/L+Beta-Cyfltrithin100g/L) For Efficacy against Antestia Bugs in Coffee

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\textbf{ABSTRACT}

The withdrawal of most of the insecticides from the market due to their high toxicity has left farmers with few options for the control of Antestia bugs in coffee. Field and laboratory trials were conducted at Coffee Research Institute, Chipinge, during the 2013 and 2014 season to determine the efficacy of Thunder 480SC in the control of Antestia bugs in coffee. A Randomized complete block design (RCBD) with four treatments each replicated four times was used for the trial. The results showed that Thunder at 20ml to 40ml/100l water performed equally the same to the standard chemical, Dursban, at 75ml/100l water, both in field and laboratory studies. Thunder is therefore a potential alternative for Dursban which is being phased out due to health and environmental concerns. It has since been registered for use at controlling Antestia bus in coffee. This study was completed in 2014.

\textbf{Key Words:} Antestia bug, Thunder, health, efficacy
137. Evaluation of Movento 240SC (*Spirotetramat*-240g/L) for Efficacy against Antestia Bugs (*Antestiopsis* Sp.) In Coffee in Zimbabwe

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**ABSTRACT**

Most of the insecticides which were used for Antestia bugs control are now being restricted in coffee for health and environmental concerns. There is therefore need to screen new insecticides to find alternatives. Field trials were conducted to determine the efficacy of Movento 240SC (*Spirotetramat*-240g/L) in the control of Antestia bugs in coffee. The trial was conducted at Coffee Research Institute, Chipinge, during the 2013 and 2014 seasons. A Randomized Complete Block Design (RCBD) with four treatments each replicated four times was used for the trial. Percent mortality was transformed using arcsine before analysis for variance in GENSTAT 14. There were significant differences in Antestia bug mortality in the first 24 hours due to treatments \((p<0.05)\) during the 2013 and 2014 seasons. Movento 240SC at 20ml/100l water and 60ml/100l water gave good control of the pest, which was comparable to the standard chemical. There were no significant differences in Antestia bug mortality among Movento treatments during the 2014 season. The standard chemical, Dursban, was comparable to Movento at 20ml/100l and 60ml/100l during the 2013 and 2014 season. The trial was completed in 2014.

**Key Words:** Antestia bug, Movento, Health hazards.
138. Screening Of Thunder (Imidacloprid-G/L+ Beta-Cyflthrin G/L) For Efficacy against Mealy Bugs (Planococcus citri) In Coffee

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**ABSTRACT**

Mealy bug is an important pest for coffee in Zimbabwe. The control of mealy bugs is mainly achieved through the use of insecticides such as Orchex and Diaznon. These insecticides are now being restricted for use in coffee due their high levels of toxicity. There is need to evaluate other insecticides that belong to a safer generation of insecticides. The objective of the trial was to evaluate Thunder for efficacy against mealy bugs in coffee. The trial was carried out at New Year's Gift (Tanganda Estates) in a six year old coffee block. The trial was laid out in a Randomized Complete Block Design (CRBD). There were five treatments; Thunder at 15ml/100litres water, 20ml/100litres water and 30mls/100litres water. Chlorpyrifos was used as the standard and untreated plots as the control. Preliminary results indicated that all treatments performed better than the control. The trial is expected to continue for two more seasons in order to have conclusive results. The trial will be completed in 2016.

**Key Words** Mealy bug, Thunder, efficacy, toxicity
139. Evaluation of Plant Extracts for the Control of Antestia Bugs *Antestiopsis Sp* under Laboratory Conditions

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**ABSTRACT**

The use of synthetic insecticides for the control of Antestia bugs has come under attack due to health and environmental concerns. Evaluation of several plant extracts becomes imperative for the control of Antestia bugs in coffee. Evaluation of *Euphorbia*, *Lantana camara*, *Datura stramonium*, Chili and Mukina extracts was carried out in the laboratory. Each plant extract was prepared in four concentrations which are 25%, 50%, 75% and 100% concentrations. The trials were laid out separately for each plant extract in a randomized completed block design replicated three times. *Euphorbia*, *Datura stramonium*, *Lantana camara* and Mukina gave comparable efficacy to the standard chemical Dursban (Chlorpyrifos). They were all effective at controlling Antestia bug. However the experiments are to be continued next season in the laboratory and the field for more concrete results.

**Key Words:** Synthetic chemicals, Plant extracts, Antestia bug, laboratory.
Evaluation of Calypso 480SC (Thiocloprid 480G/L) For Efficacy against Antestia Bugs (Antestiopsis Sp) In Coffee

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ABSTRACT
Antestia bug remains one of the major pests in coffee production. Most of the insecticides which were used for Antestia bug control are now being restricted for health and environmental concerns. The thrust of research is now to find alternative environmentally friendly insecticides. The trial was established at Coffee Research Institute, Chipinge to determine the efficacy of Calypso 480SC against Antestia bugs in coffee. The trial was laid in a Completely Randomised Block Design (CRBD), with four treatments replicated three times. There were highly significant differences in mortality due to treatments ($p<.001$) for two consecutive seasons, 2013 and 2014. In 2013, Calypso at 20ml/100l, 60ml/100l gave comparable results to the standard chemical, Dursban, which were significantly different from Calypso at 30ml/100l water and the control. In 2014 season, all Calypso concentrations were comparable to the standard chemical in the control of Antestia bugs. The fact that Calypso gave comparable control to the standard at lower concentration and is less hazardous shows that it can be used as a replacement of the standard chemical. The trial was completed in 2014.

\textbf{Key Words:} Antestia bug, Calypso, Dursban, health, environment
141. Evaluation of Different Botanicals for the Control of Coffee Leaf Rust (Hemileia Vastatrix)

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ABSTRACT

Coffee Leaf Rust (Hemileia vastatrix) causes severe losses in almost all coffee producing areas worldwide. Chemical controls being the mostly used method have caused severe environmental pollution. A laboratory experiment was conducted at Coffee Research Institute, Chipinge with the objective of examining the efficacy of some plant extracts against Coffee Leaf Rust; viz Lemon grass (Cymbopogon citratus), Aloe vera (Aloe barbadensis), Horseradish tree (Moringa oleifera) and Tobacco (Nicotiana tabacum) at three different concentrations (100, 50 and 25% leaf extracts). Copper Oxychloride 85WP was used as a standard fungicide and distilled water as a negative control. The experiment was a 4 x 3 factorial in Completely Randomised Design (CRD) with four replications. The first factor was the four botanicals and the second was the respective concentrations. The plot size was three Petri dishes. There was an interaction (P = 0.022) between different botanicals and their different concentrations. Moringa at 100%, Lemon at 50 and 100% gave the highest number of ungerminated spores which differed significantly (p<0.05) from Copper Oxychloride. Lemon grass extract at 50% did not significantly different from the 25% treatment. There were no significantly differences between Copper Oxychloride and the undiluted tobacco and Aloe vera extracts. Distilled water did not inhibit spore germination in vitro. There were strong positive correlations between spore germination inhibition and extract concentration. All the plant extracts managed to inhibit spore germination and therefore showed great potential for use as alternatives to the synthetic fungicides especially by the smallholder farmers with the small land sizes. The trial still needs to be established under Greenhouse and field conditions before recommendations for use by the farmers.

Key Words: Coffee, Cymbopogon citratus, Aloe barbadensis, Moringa oleifera and Nicotiana tabacum, Hemileia vastatrix
The Effect Of Weather Variables On The Development Of Epidemics Of CLR Under Field Conditions

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ABSTRACT

While chemical control for Coffee Leaf Rust (CLR) is considered very effective, an understanding of the pathogen, host and environmental interactions is very important in integrated disease management. The trial was aimed at determining the effect of temperature and rainfall on the occurrence of Coffee Leaf Rust under field conditions at Coffee Research Institute. Twenty trees were randomly marked in each of the three blocks with each tree having four primary branches being tagged for data collection. Weather data was collected using an automated electronic weather station. The data was analysed using Genstat 14\(^{th}\) edition. Multiple Linear regression was done for rainfall and temperature (maximum and minimum) data on Coffee Leaf Rust epidemics. The results indicated no significant relationship between rainfall and temperature to Coffee Leaf Rust epidemics \((p = 0.38, r^2 = 0.22)\). Mean temperature and rainfall had a weak relationship \((r^2 = 0.2 \text{ and } p = 0.07)\) with the disease. There was also no significant relationship between rainfall received and Coffee Leaf Rust incidence for the season. Both rainfall and temperature showed a weak relationship with CLR incidences. The trial is still ongoing, and will be completed in 2016.

Key Words: Coffee Leaf Rust, temperature, rainfall, regression
Evaluation of Shade on the Development of Coffee Diseases (Coffee Leaf Rust and Cercospora)

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ABSTRACT
Smallholder farmers have limited land and have poor resource base but need to grow both food and cash crops. The intercropping of coffee with bananas will provide extra income and farmers are already intercropping coffee with bananas and other annual crops. The trial was initiated to evaluate the different shade intensities on the development of Coffee Leaf Rust and Cercospora. The trial was conducted at Coffee Research Institute and was laid out in a Randomised Complete Block Design with four treatments replicated three times. The treatments were the control (no shade), 1 row coffee between 2 rows bananas, 2 rows coffee between rows bananas, and 3 rows coffee between 2 rows bananas. Data was collected on ten data plants on total number of leaves per branch, number of infected leaves were collected for both Coffee Leaf Rust and Cercospora. Data was used to calculate percent leaf infection. Data was analysed using Genstat 14\textsuperscript{th} Edition. There were significant differences ($P < 0.001$) in Coffee Leaf Rust incidences due to shade. No shade (control) did not differ significantly with the maximum shade and medium shade (1 row coffee between 2 rows bananas, 2 rows coffee between rows bananas respectively). Lowest shade significantly differed with all other treatments. There were no significant differences ($P = 0.472$) in Cercospora percent infection. The study is on-going and will be completed in 2016.

Key Words: Coffee Leaf Rust, Cercospora, intercropping, shade
Evaluation of Botanicals against Coffee Leaf Rust in Field

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ABSTRACT
Coffee Leaf Rust (CLR) is a major coffee disease which lead to severe yield loses if left uncontrolled. Control strategies are mainly through the use of fungicides. Use of bio pesticides and resistant/tolerant varieties are other options employed in the management of CRL. The trial was aimed at evaluating the botanicals for the control of Coffee Leaf Rust under field conditions. The experiment was carried out at Coffee research Institute. The trial was laid out in a Randomised Complete Block Design with five treatments which were in four replications. Treatments were Lantana camara at 50% concentration, Albizia spp at 50% concentration, copper oxychloride at 15ml/15litres of water and the control (untreated). Data on total number of leaves and total infected leaves were collected to calculate percent leaf infection (incidences). The data was analysed for variance using the Genstat 14 software. Significant means were separated using the LSD test. The results showed that there was a significant difference (p<0.001) in percent leaf infection. Copper oxychloride gave the best control of Coffee Leaf Rust and significantly different from all other treatments. Botanicals (both Lantana camara and Albizia spp) did not differ significantly from the control. More research needs to be done on plant extracts under field conditions. The trial was terminated.

Key Words: Coffee Leaf Rust, biodegradable, Lantana camara, Albizia spp.
Crop Breeding Institute

145. **Evaluation of Promising Common Bean (Phaseolus Vulgaris L.) Breeding Lines under Different Environments in Zimbabwe**

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**ABSTRACT**

In Zimbabwe, common bean (Phaseolus vulgaris L.) is an important crop of the farming systems. The crop generates income, provides improved nutrition and food security. Despite the importance of the crop, challenges are still faced in its production. The objective of the study was to identify common bean genotypes with high grain yield stability and wide adaptation across six environments. The experiments were laid out in an alpha lattice design with three replications. Grain yield data were subjected to analysis of variance using the breeding management software. The two canning bean genotypes, CIM-NAV02-16-1-2 (1416kg/ha) and CIM-CLIMB01-1-1 (1554kg/ha) had yields that were significantly (P<0.001) different from the check, Michigan pea bean (1226kg/ha). These two canning bean genotypes are late maturing (110 days); therefore have enough time for grain filling which translates to high grain yield. The small red bean genotype GCI was consistently high yielding across locations, but farmers throughout the main bean growing areas in Zimbabwe rejected the genotype during participatory selection. The yield of the sugar type was not significantly different from the best checks. However, the genotypes such as the pre-release line DAB287 have other aided advantages such as early maturing and disease resistance. The two canning bean genotypes will be submitted for DUS tests during the 2015/16 season and are recommended for production using supplementary irrigation. DAB287 has been consistently high yielding over the past two seasons and will be recommended for release during the 2015/16 season. The sugar types will be evaluated further under on-farm conditions and in farmers’ fields. The high yielding genotype GCI which was rejected by farmers because of its size and colour will be used in the crossing block.

**Purpose:** To identify superior genotypes that could be valuable for the common bean improvement programme and varietal release so as to improve household food security

**Subject:** Common bean Variety Evaluation

**Status (completed/in progress):** in progress

**Subject:** Crop Improvement

**Intended publication:** journals and scientific papers
146. Improving the Resilient Cowpea Crop to Suit the Farmers’ Needs in Zimbabwe


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ABSTRACT

Cowpea is one of the most drought tolerant crops cultivated in Zimbabwe and sub-Saharan Africa. The crop is highly adapted to diverse cropping systems including poor environments. Apart from being a rich source of carbohydrates, its grains and leaves are dense in proteins, vitamins, fibre and minerals including iron and zinc. Cowpea is a low input crop, about 90% of its Nitrogen requirement comes from the atmosphere through Nitrogen fixing. The crop fits well in communal farmer cropping systems in rotations with cereal and tuber crops, and crop-livestock farming systems. Cowpea research at crop breeding institute was previously directed on developing high yielding early maturing crop varieties. Recently the focus has shifted to market led research. The local market prefers large seeded varieties and the international market prefers blacked eyed pea varieties. Farmers in the low potential, marginal areas of Zimbabwe prefer high fodder and high grain yield varieties which can sustain both the farmers with grain and their livestock with the fodder in the dry season. Climate change is bringing along with it heat waves, intense drought and more pests and diseases. Cowpea because of its natural resilience to environmental production constraints, it gives hope for the future and this is more certain with further improvement through breeding. Superior genotypes can be created through crosses including wide crosses and mutation breeding and introductions. Efficient low cost screening methods for drought tolerance and aphid resistance using box plots and root cylinders will be employed. Precision phenotyping and genotyping with electronic gadgets is targeted to evaluate large populations of segregating mutants for desirable targeted traits. Box plots and root cylinders are cheaper and flexible methods, independent of weather and have the potential to screen huge populations in little time and space. Selected lines will be tested in the field for yield, adaptation and stability across sites. The lines will also be evaluated for nutritional content levels particularly protein, vitamins, iron and zinc.

Purpose: To develop, evaluate, release and disseminate improved, adapted and stable cowpea varieties to all the farmers across Zimbabwe.

Status (completed/ in progress): in progress

Subject: Crop Improvement

Intended publication: journals and scientific papers
**ABSTRACT**

Foliar feeding is the practice of applying liquid fertilizers to plant leaves. In this study the effect of Polyfeed foliar fertilizer on yield of onion was investigated at Horticulture Research Centre in Marondera from April 2015 to August 2015. The following treatments were considered, 100% compound S, 50% compound S+ 50% Polyfeed(12%N, 3%K, 3%Ca and 3% MN), 75% compound S+25% Polyfeed and 100% Polyfeed. Polyfeed was applied 30, 45 and 60 days after transplanting. The plots were laid in RCBD with 4 replications of each treatment. Normal agronomic practices were followed such as pest and disease control. Onions were harvested when 70% of the necks had collapsed on 30 September 2015. The bulbs were left for 14 days in the field to cure before data collection. Preliminary results indicated the plants with 50% compound S recommendation and supplemented with 50% Polyfeed were tallest, most vigorous, produced heaviest bulbs and gave the highest yield per hectare. Polyfeed was applied 30, 45 and 60 days after transplanting. These results were highly significant from other treatments ($P<0.01$). However sole application of Polyfeed gave the least yield and produced less vigorous plants. Application of 75% compound S+25% Polyfeed and 100% compound S showed no significance in results. Onions treated with 100% compound S had the highest unmarketable yield and this was significant from all 3 treatments. This was contrary to onions applied with 100% Polyfeed which had the least unmarketable yield. This could be attributed to calcium and manganese that offer resistance to fungal diseases. However it is recommended to apply 50% compound S and 50% Polyfeed to achieve best yields at the same time maintaining routine application of preventative fungicides.

**Key Words:** onion, foliar, Polyfeed, yield, fertilizer.
Yield of Irish potato in several parts of Zimbabwe is low at an average of 5t/ha (FAO, 2000) due to poor agronomic practices amongst them, the choice of correct basal dressing, timing and application regimes. Conventionally basal fertilizer is applied once at planting in potato production in the form of compound S, C or potato blend. However according to Siczeka (2001) potato plants effectively utilizes phosphorous and potassium at a point when young roots are formed. This period corresponds to the second to third week of plant growth after emergency. At Matapiri Seed Sales they recommend application of 2/3 basal at planting the remainder 1/3 at 2 weeks after emergency for high yield return. Hence the study aimed at finding out the impact of split basal application on the yield and quality of potato at Horticulture Research Station and Chishawasha from February 2015 to May 2015. The following treatments were considered, 100% basal fertilizer (BF) at planting, 60% (BF) at planting and 40% after 2 weeks, 40% (BF) at planting and 60% after 2 weeks and 50%(BF) at planting and 50% after 2 weeks. Basal fertilizer used was potato blend at 1600kg per ha. Preliminary results indicate significant differences in the marketable yield and mean weight ($p<0.05$) due to treatment effect. The highest yields were observed when potatoes receive 50% basal fertilizer at planting and 50% of the remainder 3 weeks after emergency. This result was significantly different from the rest of the treatments. The superior yields could be as a result of sufficient potassium and phosphorus for root, stolon and tuber initiation and growth at critical developmental stages of the plant. Lowest yield was observed when a third of basal was applied at planting. This may have been attributed to limited potassium and phosphorous required for adequate stolon formation. The mean tuber weight was significantly different with basal fertilizer split applied equally achieving higher yields. However the mean diameters were not significant amongst treatments. Results are not yet conclusive as the trials will run for three seasons, with possible inclusion of other 3 sites were agro-ecology differ.

**Key Words:** potato, basal fertilizer, split application, potassium, phosphorous.
149. The Effect of Different Bending Intensities on Growth Characteristics, Yield and Quality of Roses (*Rosa Hybrida* L)

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**ABSTRACT**

A greenhouse experiment to investigate the most appropriate cultural technique to improve rose cut flower yields was conducted at Horticultural Research Centre, Marondera, Zimbabwe. Coppillia, rose cultivar, was exposed to four different bending intensities, which are (i) bending only the weak stems, (ii) bending whole plants at zero degree (0\(^o\)) (iii) bending whole plants at forty-five degrees (45\(^o\)) angle to the ground and (iv) pinching only (check), to break bud dormancy. Plant growth characteristics, yield and flower quality were assessed at ten weeks after effecting the four different cultural methods. The results showed that bending of only weak and thin stems gave a significantly (\(p<0.05\)) higher number of total marketable stems, plant height (cm), number of branches per bush, stem diameter (mm), number of flowering branches and bloom quality. The bending of weak and thin stems only is recommended to improve rose yield and quality. The study completed in December 2014.

**Key Words:** bending intensity, *Rosa hybrida*, growth characteristics, yield, quality
ABSTRACT

The horticultural world market is going organic in most horticultural produce thus experience into organic fruit production has to be built for research to remain relevant to the Industry. High density fruit tree management has been experimented at Horticultural Research Institute (HRI) and has given positive results for deciduous fruit tree yields. The paper seeks to assess the varietal responses in to different fertiliser applications. An experiment was established on 12 November 2012 at Horticulture Research Institute to evaluate the performance of four plum cultivars under different fertilisers and different applications. Plum planting material was raised as straight cuttings from mother stock plants at HRC. The trial was laid as a split plot experimental design in a Randomised Complete Block Design with 16 treatment combinations replicated four times. The gross plot is made up of 64 trees with cultivar the main plot and fertiliser will be the sub plot at four levels. The cultivars were Rosearli, Sapphire, Santarosa and Souvenior. Plants were spaced at 3m*1.5m at a planting depth of 60cm*60cm*60cm. Cut back and pruning was done in the first year of growth. Organic enriched fertilisers from Nico-Orgo (Pvt) ltd, Compound J organic enriched (15:5:20), Compound C organic enriched tobacco fert (5:15:12) and 100% organic soil builder (2:2:2) were used against the normal standard Compound J (15:5:20). Noticeable differences were noted in the first year of growth. Data recorded so far shows a positive increase in girth (mm). Flowering differences were also observed within the different cultivars as affected by fertiliser. More data will be collected on growth rate (extension growth), girth (mm), marketable yield kg/tree, unmarketable yield kg/tree (insect/bird damage/hail damaged/ windfalls/ rots/smalls). The trial is still on going and will complete in 2019. Recommendations will be made after first harvest.

Key Words: plum, organic, fertiliser, density, yield
Climate Change and the Future of Apple Production (*Malus Domestica*): Case of Marondera District, Mashonaland East Province, Zimbabwe

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**ABSTRACT**

This paper analyses the potential impacts of climate change on apple production in Marondera District, Zimbabwe. The Climate Change Wizard online tool was used to make historic and mid-century projections on temperature (°C) and precipitation (mm) the major drivers of crop production in the country. The A2 scenario extracted from Special Report on Emission Scenarios (SRES) was used. The scenario was run using four different models to project monthly outputs. The model outputs were related to the observations made on the flowering of an 18 year old apple orchard growing at the Horticulture Research Institute. It was observed that the flowering season for the apple cultivars is commencing earlier than previously. The projections show an increase in annual precipitation, increasing mean monthly maximum and minimum temperatures. Marondera will thus be characterized by hot summers and warmer winters as shown by increasing minimum temperatures around May to August. The increasing temperatures could make the environment unsuitable for apple production in the near future. It could also have a negative impact on the expansion of apple production in the country as region one is also shrinking due to climate change. This work started in 2014 will be completed by June 2016.

**Key Words:** climate change, apples, temperature, precipitation, projections, flowering
ABSTRACT
Use of Ammonium nitrate and or urea in potato production was a topic for discussion amongst farmers and scientists. Availability and also the issue of volatilization of urea when applied was one disadvantage of using urea. An experiment was conducted at Horticulture Research Center to investigate the effect of nitrogen source on Irish potato yield. The trial was planted in summer, in November 2011. The experiment was laid out as a complete randomised block design with 6 treatments and replicated three times. Using 10g of Ammonium nitrate was selected as the control as a practice being mostly done by farmers. Land preparation involved ploughing, discing and row marking. Compound S fertilizer was broadcast in the furrows at planting using a rate of 1500kg/ha. Each plot consisted of 4 rows with 15 plants spaced 0.9x0.3m. The two center rows were used as the net plot. The treatments were applied 2 weeks after emergence before earthing up as a side dressing. There was no significant difference \( p \geq 0.05 \) when either ammonium nitrate or urea was used on marketable yield and tuber size. It was concluded that both fertilisers can be used for potato production without a negative effect on the yield.

Key Words: potato, nitrogen source, urea, ammonium nitrate,
ABSTRACT

Potato production is on the increase in Zimbabwe both among commercial and smallholder farmers. Potato is an important crop, ensuring food security and has high returns. Shortening of the tuber dormancy period is necessary in order to have a quick return to the field after harvest. Farmers can retain seed up to at most 4 planting seasons. Gibberellic acid is used to quicken the sprouting process and can reduce storage costs and loses from pests. However there was concern on whether different varieties respond differently. An experiment was therefore set up to determine the influence of gibberellic acid on six potato varieties mostly grown in Zimbabwe (Montclare, BP1, Amethyst, Pimpernel, Diamond and Mondial. It was a factorial experiment in CRD with 2 factors that is three Gibberellic acid levels (0, 16ml and 32ml) and the 6 potato varieties. Each plot consisted of 20 potato varieties that were immersed for 5 minutes in gibberellic acid as per the concentrations. Tubers were removed and allowed to dry on grass bedding. Data was collected on days to sprouting and was analysed using Genstat. There was a significant difference p≤ 0.05 on days to sprouting with the control (no gibberellic acid) taking the longest number of days to sprout (mean 40days). Doubling the concentration delayed sprouting on Mondial and Diamond by ± 7 days whilst amethyst shrivelled and dried.

Key Words: potato, sprouting, Gibberellic acid concentration,
ABSTRACT
The south eastern Lowveld of Zimbabwe has a large potential to produce wheat for the nation with its well developed irrigation and large water bodies. With agronomy, the questions relate to the strategic and tactical management of soil and soil water, the crop planting date, its density, rows pacing and fertilisation, and the management of biotic stresses, all done so as to maximise economic return at acceptable risk levels. (Fischer 2011). In the winter of 2010, six wheat varieties Nduna, Kana, SuperB, Insiza, Scarlet and Dande were planted at four sowing dates spaced at fortnightly intervals. Variety stallion was also planted at the same sowing dates and subjected to six levels of nitrogen fertiliser: 0, 50, 100, 150, 200 and 250 kg/ha nitrogen. The experiment was repeated in 2011. The two highest yielding wheat varieties were SC Smart with a grain yield of 3033 kg/ha and SC Sky with 2971Kg/ha. There were highly significant (p<0.01) differences in grain yields between the fertiliser levels averaged across sowing dates. There were no significant differences in grain yields of the different sowing dates and no significant interaction between sowing date and fertiliser level. There was significant (p<0.05) positive correlation between grain yield (Kg/ha) and level of N fertiliser. There were no significant differences in grain yields across sowing dates. There was no significant interaction between sowing date and time of applying fertiliser. The highest average wheat grain yield of 3476kg/ha was obtained with the 21st May sowing while the lowest grain yield of 1903 kg/ha was obtained with the 16th of July Planting. There was a significant negative correlation between sowing date and grain yield. Variety Sekuru yielded constantly across sowing dates.

Key Words: Agronomic Strategies, Optimizing Wheat Yields, South Eastern Lowveld of Zimbabwe.

Date when the study was completed December 2014
Effect of Mulch on Growth and Yield of Okra under Overhead Irrigation Conditions of the South East Lowveld of Zimbabwe

Chipanga D., Macheke E. and Dube R.C.

Department of Research and Specialist Services, Lowveld Research Institute.

ABSTRACT
Mulching as a management practice increases water use efficiency and ultimately productivity. A trial evaluating the effect of different organic mulches on growth and yield of okra and soil temperature was carried out from 2012 to 2014 in the Lowveld of Zimbabwe during dry hot season under overhead irrigation. Three types of organic mulch materials with two different thicknesses per mulch were used. Treatments were maize stover at 15cm, maize stover at 7cm, bean stover at 15, bean stover at 7cm, dry grass at 15cm, dry grass at 7cm thickness and bare ground was used as a control for comparison. The trial was carried out in a randomized complete block design (RCBD) with three replications. Soil temperature was measured at 0600, 1300 and 1800 hours. Results showed that much materials at different thickness significantly (P<0.05) increased pod growth while plant growth and yield were not increased by mulch and soil temperature leading to the observed results which were not significantly different (P>0.05). Maize stover, bean stover and dry grass at 15 or 7cm thickness as organic mulches are not recommended in okra production under irrigation.

Key Words: Okra, mulch, growth, yield and irrigation.

Date when study was completed: December 2014
156. Effect of Mulch on Growth and Yield of Green Mealies under Overhead Irrigation Conditions of South East Lowveld of Zimbabwe

Chipanga D., Macheke E and Dube R.C.

Department of Research and Specialist Services, Lowveld Research Institute.

ABSTRACT

Mulching as a management practice increases water use efficiency and ultimately productivity. A trial evaluating the effect of different organic mulches on growth and yield of green mealies and soil temperature was conducted from 2012 to 2014 in the Lowveld of Zimbabwe under overhead irrigation during dry hot season under irrigation. Three types of organic mulch materials with two different thicknesses per mulch were used. Treatments were maize stover at 15cm, maize stover at 7cm, bean stover at 15, bean stover at 7cm, dry grass at 15cm, dry grass at 7cm thickness and bare ground was used as a control for comparison. The trial was carried out in a randomized complete block design (RCBD) with three replications. Soil temperature was measured at 0600, 1300 and 1800 hours. Results showed that maize stover mulch at 15cm thickness significantly ($P<0.05$) increased plant growth while cob growth and yield were not increased by mulch and soil temperature leading to the observed results which were not significantly different ($P>0.05$). Maize stover, bean stover and dry grass at 15 or 7cm thickness as organic mulches are not recommended in maize for green mealies production under irrigation.

Key Words: Green mealies, mulch, growth, yield and irrigation.

Date when study was completed: December 2014

Marina D., Mutayatyu M. Ndigwirei T and Zishe Z.

Department of Research and Specialist Services, Lowveld Research Institute.

ABSTRACT
Drought is a major limitation to agricultural production in the southeast Lowveld of Zimbabwe. Rainfall is inadequate and is punctuated by mid-season droughts. Terminal droughts are common and are the major causes of crop failures and low crop yields. Another constraint to crop production in the southeast Lowveld of Zimbabwe is poor soil fertility. A study was carried at Chiredzi Research Station to investigate the effect of two tillage systems and six soil fertility options and their interactions. The two tillage systems were zai pits (planting basins) and mechanized zai (deep tied plough furrows). The two tillage systems were compared with the farmers’ conventional method of planting on the flat. The soil fertility options were: 0 added fertility, 5tonnes /ha manure, 5t/ha manure plus 100 kg/ha AN, 5 t/ha buried crop stover, 5 t/ha buried stover plus 100 kg/ha AN and 150 kg/ha compound D plus 100 kg/ha AN. Results show that there were no significant in yields between tillage systems and soil fertility options. The conventional method of planting on the flat had lower yields than planting basins and deep tied plough furrows although there were no significant differences. The conventional method of planting without fertilizers had lower yields than other fertility options.

Key Words: planting basins, deep tied plough furrows, conventional, drought and fertility option

The study was completed in 2012/13 rainfall season

Maringa D., Mutyatyu M., Ndigwirei T and Zishe Z.

Department of Research and Specialist Services, Lowveld Research Institute.

ABSTRACT

Inadequate soil moisture and poor soil fertility are the major constraints to successful crop production in semi-arid regions of sub-Saharan Africa. Experiments to determine the effect of planting basins and deep tied plough furrows with cattle manure, crop Stover and inorganic fertilizers were conducted at Chiredzi Research Station, semi-arid region v of Zimbabwe from 2009/2010 to 2012/2013. Planting basins increased grain yields by 13.74% (2.023t/ha vs. 2.293t/ha) in the four years. Planting basins reduced grain yields in 2009/2010 by 3.9% and increased grain yields by 18%, 18% and 16.2% in 2010/2011, 2011/2012 and 2012/2013 respectively. Addition of organic and inorganic fertilizers increased grain yields by 0.5% to 25.97%.

Key Words: Manure, organic fertilizer, inorganic fertilizer, planting basins (Zai pits) and deep tied plough furrows (mechanized zai).

The study was completed in rainfall season 2012/13
On-going research work

159. Evaluation of Pre-Emergent Herbicides in Smallholder Irrigated Beans Production

*Mhazo C., Chikambure F.C. and Ndigwirei T.*

*Department of Research and Specialist Services, Lowveld Research Institute.*

**ABSTRACT**

Herbicides offer a faster method of weed control which allows management of weeds on large cropped areas including smallholder irrigation schemes. The objective of the study is to ascertain the application rate of the pre-emergent herbicide Dual Magnum that gives the highest and most economical weed control on basalt clay soils. The application rate of pre emergent herbicides is dependent on the soil texture with higher rates being applied in soils with higher clay content. Bean variety NUA45 was be used in the trial and the herbicide Dual Magnum was applied using a knapsack sprayer at 1 litre per hectare, 1.5 litres per hectare, 2 litres per hectare, 2.5 litres per hectare and 3 litres per hectare. A control treatment where hand hoeing is done three times was included. The experimental design was a randomised complete block design with 5 treatments replicated three times.

**Key Words:** Pre-emergent herbicide, smallholder irrigation schemes, beans production and Dual Magnum.
160. Evaluation of Three Selected Herbicides in Smallholder Irrigation Bean Production

Mhazo C., Chikambure F.C. and Ndigwirei T.

Department of Research and Specialist Services, Lowveld Research Institute.

ABSTRACT
The objective of the trial is to evaluate the effectiveness of three selected herbicides in controlling weeds in beans production in the south Eastern Lowveld of Zimbabwe. The herbicide treatments are Dual magnum, Basagran and Fusilade. The trial was initiated in the winter of 2014 in Tshovani Irrigation Scheme, Chiredzi District, Zimbabwe. The variety NUA 45 was used and Dual magnum the pre-emergence herbicide was applied to the soil after irrigation. The post emergence herbicides basagran and fusillade were applied after one month. The Experimental Design was a Randomised complete block design with 5 treatments replicated three times. Weeding was done once in the control treatment at the required time. Records of the types of weeds present in the different treatments were recorded during the growing season. Beans grain yield per plot was recorded after harvesting.

Key Words: Smallholder irrigation, Dual magnum, Basagran, Fusillade, hand hoeing and beans grain yield.

Date when study is expected to be completed: December 2018
161. Effect of Spacing on Leafy Growth and Yield of Mustard Rape (Brassica Juncea)

Chipanga D., Macheke E. and Dube R.C.

Department of Research and Specialist Services, Lowveld Research Institute

ABSTRACT
The yield potential of mustard rape is severely affected by its susceptibility to bolting. Bolting can be as early as one week after transplanting and has been observed to occur even in the nursery. A trial is being carried out at Chiredzi Research Station under hot season to evaluate the effect of different plant spacing on leafy growth, yield and bolting of mustard rape. The treatments under investigation are inter row and in row spacing of 0.6 x20, 0.6 x30, 0.6 x40, 0.6 x50. Preliminary results on this work showed that, there were significant differences on the yield of marketable leaves although the crop bolted at the same time but generally the leafy growth and marketable yield was increased by increasing the spacing. Significant difference on marketable yield has clearly shown that, treatment one (0.6 x20) out yield the rest treatments (0.6 x30, 0.6 x40 and 0.6 x50).

Key Words: Mustard rape, spacing, growth, yield, bolting and irrigation.

Date when study is expected to be completed: December 2015
Effect of Organic Mulch on Leafy Growth and Yield of Rape (Brassica Napus)

Chipanga D., Macheke E. and Dube R. C.

Department of Research and Specialist Services, Lowveld Research Institute

ABSTRACT

High soil temperature can significantly and adversely reduce the potential leafy yield of rape in the south east Lowveld of Zimbabwe. Moisture conservation measures can be important under such situations. Mulching has been advocated as an effective means for such situations. A trial is being carried out at Chiredzi Research Station under hot season to investigate the importance of mulching rape using grass and maize stover. The objective of the trial is to evaluate the effect of different organic mulch and soil temperature on growth and yield of rape. The treatments are maize stover 15, maize stover 10, dry grass 15 and dry grass 10cm thickness and bare ground (control). Preliminary results showed that, leafy yield on mulched treatments were generally higher than unmulched treatment suggesting that, organic mulches used have a positive effect on rape yield produced in hot season under the south east Lowveld of Zimbabwe although results showed no significant difference among treatments.

Key Words: Mustard rape, spacing, growth, yield, bolting and irrigation.

Date when study is expected to be completed: November 2016
ABSTRACT

In the southeast Lowveld of Zimbabwe natural region V, inadequate soil moisture and poor soil fertility are the major challenges to successful and sustainable crop production. Experiments are being carried out at Chiredzi Research Station to evaluate the effect of planting basin depth and level of soil-applied fertility on crop yields. Three basin depths: 15cm (standard), 25 cm and 35 cm and five fertility levels: 5t/ha manure, 5 t/ha manure +100kg/ha AN, 10 t/ha manure, 10 t/ha manure + 100kg/ha AN and 150kg/ha compound D +100kg/ha AN as top dressing (control) are going to be evaluated to see their influence on crop yields (sorghum and maize). The experiment commence 2013/2014 rainfall season

Key Words: Planting basins depth, applied fertility and manure

The study is expected to be completed in rainfall season 2018/19
Effect of Planting Basin Depth and Level of Soil Applied Fertility on Sorghum

Maringa D, Mutyatyu M, Ndigwirei T and Zishe Z.

Department of Research and Specialist Services, Lowveld Research Institute.

ABSTRACT
In the southeast lowveld of Zimbabwe natural region V, inadequate soil moisture and poor soil fertility are the major challenges to successful and sustainable crop production. Experiments are being carried out at Chiredzi Research Station to evaluate the effect of planting basin depth and level of soil-applied fertility on crop yields. Three basin depths: 15cm (standard), 25 cm and 35 cm and five fertility levels: 5t/ha manure, 5 t/ha manure +100kg/ha AN, 10 t/ha manure, 10 t/ha manure + 100kg/ha AN and 150kg/ha compound D +100kg/ha AN as top dressing (control) are going to be evaluated to see their influence on crop yields (sorghum and maize). The experiment commence 2013/2014 rainfall season

Key Words: Planting basins depth, applied fertility and manure

The study is expected to be completed in rainfall season 2018/19
The Effect of Intercropping Maize and Pigeon Pea

Marieng D., Mutyatu M., Ndigwirei T and Zishe Z.

Department of Research and Specialist Services, Lowveld Research Institute.

ABSTRACT
Shortage of rainfall during the crop-growing season is the major constrain to crop productivity and production in the southeast lowveld of Zimbabwe natural region v, (NRV). The situation is exacerbated by climate change. Droughts are more intense and more frequent than in the past. Crop failures are also more common than in the past. Experiments are being carried out at Chiredzi Research Station to evaluate the effect of maize/ pigeon pea intercropping on maize yield. The experiment is aimed at reducing the problem of complete crop failure by farmers. Pigeon pea is a drought tolerant legume plant with different rooting system when compared to that of maize. The land is being ploughed and ridged to form 1 m tied ridges and furrows. The maize variety being used is SC 513 and the pigeon pea variety is ICPL 87. Fertilizer is only applied to maize at 150 kg /ha compound D and 100kg/ha A.N. the experiment commenced in the season 2010/2011.

Key Words: intercropping, complete crop failure, drought tolerant and legume plant

The study is expected to be completed in rainfall season 2015/2016.
166. The Effect of Intercropping Sorghum and Pigeon Pea

*Maringa D., Mutyatu M., Ndigwirei T and Zishe Z.*

*Department of Research and Specialist Services, Lowveld Research Institute.*

**ABSTRACT:**
Shortage of rainfall during the crop growing season is the major constrain to crop productivity and production in the southeast lowveld of Zimbabwe natural region v, (NRV). The situation is exacerbated by climate change. Droughts are more intense and more frequent than in the past. Crop failures are also more common than in the past. Experiment is being carried out at Chiredzi Research Station to evaluate the effect of sorghum/ pigeon pea intercropping on sorghum yield. The experiment is aimed at reducing the problem of complete crop failure by farmers. Pigeon pea is a drought tolerant legume plant with different rooting system when compared to that of sorghum. The land is being ploughed and ridged to form 1 m tied ridges and furrows. The sorghum variety being used is Sv4 and the pigeon pea variety is ICPL 87. Fertilizer is only applied to sorghum at 150 kg /ha compound D and 100kg/ha A.N. the experiment commenced 2010/2011rainfall season.

**Key Words:** intercropping, complete crop failure, drought tolerant and legume plant

**The study is expected to be completed in rainfall season 2015/2016.**
The Effect of Plant Population on Sorghum Varieties

Maringa D., Mutyatyu M., Ndigwirei T. and Zishe Z.

Department of Research and Specialist Services, Lowveld Research Institute.

ABSTRACT

The southeast lowveld of Zimbabwe is entirely in natural region V where rainfall is the major factor limiting crop production under rain-fed conditions. The rainfall amount is in most cases low and erratic in distribution. Rain water is lost through runoff as a result of intensity of the rainfall storms. Summer temperatures are very high (averaging 38°C) causing high evaporation losses of 10-13 mm (Chris Lovell, 1991). Variability of rainfall amount and distribution within a season and between seasons is unpredictable. If seasons were predictable farmers would adjust plant populations according to the season. Since season quality cannot be determined, use of short season drought-tolerant crop varieties and use of populations that can at least survive most droughts may be helpful. In a good season all varieties can produce good yields with high populations. In poor rainfall seasons only low populations can produce something. The objectives of this study are: to evaluate four varieties of sorghum and three plant populations on grain yields and to determine the plant population that improves not only yields but also yield stability over many seasons. The sorghum varieties are: SV4, Macia, SC Smile and Karimtama 1. Plant populations are: 33333, 44444 and 66666 plants /ha. The trial design is a randomized complete block design replicated three times. The study commenced in rainfall season 2011/12

Key Words: Plant population, rainfall, grain yields, yield stability

The study is expected to be completed in the rainfall season 2015/16
Response of Cassava to Different Populations and Soil Fertility Levels

Maringa D., Mutyatyu M., Ndigwirei T. and Zishe Z.
Department of Research and Specialist Services, Lowveld Research Institute.

ABSTRACT
The southeast lowveld of Zimbabwe is a low rainfall area not suitable for commercial crop production under rain fed conditions but suitable for wildlife management and cattle ranching (Vincent and Thomas, 1960). The major constraints to crop production are low rainfall amount, poor rainfall distribution and poor soil fertility. The rainfall seasons are very variable and are punctuated by mid-season droughts which normally come at the reproductive stage of crops causing crop failures and low crop yields. Although the rainfall is very erratic, farmers in the southeast lowveld of Zimbabwe grow crops and succeed in getting good yields in some seasons. Maize is the most preferred crop but is very susceptible to drought and fails in most seasons. Sorghum is also grown but it produce low yield and also fails in other seasons and this result in food insecurity. Cassava, a drought-tolerant crop could improve the food security situation in the southeast lowveld of Zimbabwe and in Zimbabwe as a whole. Cassava has the potential to produce more than double the yields of cereals in marginal areas. Cassava has wide adaptability and produces reasonable yields at low production cost and can tolerate adverse weather conditions. Although cassava can produce reasonable yields under low soil fertility, it draws nutrients from the soil. Therefore adding nutrients to the soil could improve the yields of cassava without causing soil degradation. Apart from addition of nutrients, evaluation of different population could result in getting optimum plant population that would improve productivity and food security in the region. The objectives of the study are to determine the correct plant population of cassava under rain-fed conditions in the lowveld and to determine whether addition of fertilisers could improve the yields of cassava. The trial was started in 2011/12 season.

Key Words: rain-fed, plant population, fertilisers, yield

The study is expected to be completed in 2018
Agronomy Research Institute

169. Evaluation of Drought Tolerant Maize Varieties in Smallholder Farmer’s Fields Using the Mother/Baby Trial Scheme

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ABSTRACT

Sixteen varieties were compared on quantitative and qualitative traits at 10 sites and with 80 farmers in natural regions III and IV during the 2014/15 season. The objective was to identify varieties suitable for different localities of Zimbabwe. The mother/baby trial scheme was used and consisted of a researcher-managed mother trial and eight farmer-managed baby trials. The mother trial had an alpha lattice design and replicated three times. The factors were fertilizer and variety. The baby trials were in complete blocks with four varieties each. Yields averaged 1.68 and 1.42 t/ha across all sites in the green and yellow experiments, respectively. Significant differences (p<0.05 and p<0.1) between varieties were recorded at Gutu, Makoholi, Bikita and Murehwa. The intermediate late variety CZH1228 had the highest yields in both trials with an average yield of 2.12 t/ha in the green trials and 1.95 t/ha in the yellow trials. The least yields were obtained among the Intermediate late varieties with the ZS271 having the lowest yield in the green trial and early intermediate variety SIRDA MAIZE in the yellow trial. Fertilizer level had an effect on yields since high yields were obtained in green trials at all sites except with 043WH and ZS271 in Murehwa, yellow trials yielded better than green trials. There were significant differences (p<0.05) between scores by farmers after visual assessment on grain yield, weevil resistance and maturity. 043WH17 had the highest rating on weevil resistance and grain yield while ZS273 had the highest rating on maturity rate.

Key Words: Drought tolerant variety, quantitative, qualitative, mother/baby scheme

Date of completion: April 2016
Maximization of Maize Yields: Determining the Most Ideal Plant Population in Different Agro-Ecologies of Zimbabwe.

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ABSTRACT

A trial was conducted at Gwebi and Domboshawa in natural region II A, Panmure in natural region 11 B and Kadoma in natural region III. The effect of different plants populations on yield of early, medium and late maturing maize varieties was studied during the 2014-15 season. The objective was to determine which of the population densities 37 000, 44 000, 48 000, 55 000, 60 000 and 66 000 gives the best yields for each of early, medium and late maturing varieties. The trial was a split plot design with 3 replications. Population density was the main factor and variety the subplot factor. Per site analysis results showed that there were no significant differences (p<0.05) in the variety/plant population interaction, no significant differences at main plot level. Significant variety differences were observed at Domboshawa. Across site analysis showed that there was no significant difference in the variety/plant population interaction, was no significant difference between plant populations and between varieties.

Key Words: Plant population, variety, yield, ecologies

Date of completion: June 2016
Maximization of Maize Yields: Determining the Most Ideal Planting Dates In Different Agro-Ecologies of Zimbabwe

J. Makoni, B. Neurashe, A. Muzira, E. Petro, D. Munyonho

Department of Research and Specialists Services, Agronomy Research Institute

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ABSTRACT
An experiment was carried to determine the most ideal maize planting dates for maximum yields. The trial was carried out at Gwebi in natural region II A and Shamva in natural region III of Zimbabwe during the 2014-15 season. An early, medium and late maturing variety were used. The objective of the trial was to determine the planting dates which give maximum maize yields in different natural regions. Plantings were done early to mid November, early to mid December and late December to early January. The trial design was a balanced incomplete with three replications. Preliminary results showed that there was no significant interaction (p<0.05) between variety and planting date. Significant differences were observed between mean grain yields were compared at each site. Planting dates also had significant effect on grain yield. High yields were obtained with planting date 1 at both Gwebi (4.96t/ha) and Shamva (4.96t/ha). High yields were obtained from variety P2859W at both Gwebi (3.27t/ha) and Shamva (3.67t/ha).

Key Words: Planting date, variety, yield, ecologies

Date of completion: June 2017
ABSTRACT
Inoculated legumes suffer from adverse environmental conditions such as moisture stress, soil acidity and high temperatures that reduce the N$_2$ fixing effectiveness of the whole legume-rhizobia symbiotic system. Full realisation of the potential of N$_2$ fixation in such symbiotic systems can be improved when tolerant plant varieties are coupled with better adapted and high N$_2$ fixing rhizobial strains. However, not much has been done to isolate and select effective indigenous strains that may be better adapted to adverse climatic and soil conditions experienced locally. The objectives of this study were therefore to assess recently isolated indigenous rhizobia for symbiotic performance in comparison to the standard strain (USDA 110 derivative) already used in inoculant production. Field experiments were setup in six Zimbabwean districts during the 2012-2013 season. Characterisation of the soil at the study sites revealed that the soils were heavily deficient in P (< 9 ppm) with the exception of the Kushinga P College site. Uninoculated soya bean had no nodules while inoculated soya bean had nodule counts of at least 7 nodules and fresh nodule masses greater than 0.23g per plant. Inoculating with strains MAR 1491 and NAZ 25 increased soya bean grain yields by at least 17% at all sites compared to the control and achieved up to 294% and 575% grain yield increases in Hwedza. These strains were not significantly different to or were the highest performing strains at 4 out of 6 sites. While the strain MAR1491 is the current strain used in soya bean inoculant production the strain NAZ 25 shows great potential and further multi-season research is recommended before it can be used as a commercial strain.

Key words: *Glycine max*, *Bradyrhizobium Japonicum*, N$_2$ fixation

Purpose: Improving Soya bean productivity

Status: On going

Subject: Soil microbiology and fertility

Date when the study will be completed: 16 December 2015
Evaluation of Long Term Impacts of Different Fertilizer Combinations on Soil Acidity, Fertility and Maize Yield

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ABSTRACT
In Zimbabwe, smallholder agriculture is principally done on nutrient depleted sandy soils with low or zero external nutrient inputs hence declining grain yields which rarely exceed 0.5 t ha\(^{-1}\). Thus, a need for maintenance and build up of soil fertility interventions. A long term study was initiated in 1989 on two sandy soil sites with contrasting rainfall patterns, Makoholi Experimental Station and Grasslands Research Institute. The main aim was to evaluate the impacts of long term application of different soil amendments on maize grain yields, soil fertility and acidity. Results obtained since then show decreasing maize grain yields the lowest being after sole application of NPK fertilizers. Grain productivity of 0.1 t ha\(^{-1}\) has been recorded in the 2014/15 cropping season, following continuous cropping without any external nutrient resources. Evidence for nutrient mining under maize monocropping with sole NPKS fertilizer application exists as shown by soil organic carbon (SOC) levels below 0.4%. Soil fertility management options which can arrest nutrient mining are cattle manure use and fallowing which gave SOC values ranging between 0.4% – 0.5% after 22 years of experimentation. Results of soil pH following the 2011/12 season were 4.5, 4.9 and 5.1 for fertilized no lime, fertilized and limed, and virgin land, plots, respectively. Soil acidity is exacerbated by mineral fertilizer application hence the need for lime application. During the 2014/15 season, it has been shown that a significant change in weed dynamics happens over time, particularly under combined organic and inorganic nutrient amendments. Weed density increased under manure + NPKS application with the dominant species being couch grass (Cynodon dactylon). Preliminary findings suggest the need for liming and organic-based soil fertility interventions to address the problem of soil acidity and nutrient mining in Zimbabwe’s communal farming areas.

Key Words: maize, soil fertility, organic matter

Purpose: To evaluate long term impacts of different fertilizer combinations and soil management practices on soil acidity, fertility and maize yield.

Status: In progress

Subject: Soil Fertility
Molecular Characterization and Genetc Fingerprinting Of *Bradyrhizobium* Strains Isolated From Cowpea and Groundnuts

*Makasithembe Dube*

*Chemistry and Soils Research Institute*

*Soil Productivity Research Laboratory*

*P.Bag 3757, Marondera*

**ABSTRACT**

Molecular characterization of 7 *Bradyrhizobium* strains (MAR 411, 1574, 1555, 1510, 1587, 1586 and 1491) was done at National University of Science and Technology in Bulawayo to assess the extent of genetic diversity amongst the strains, to generate genetic fingerprints and to identify the strains to species level. Strains were plated in yeast extract mannitol agar (YEMA) with either congo red or bromothymol blue as a purity check and confirmation that the strains belong to the genus *Bradyrhizobium*. Strains varied from cream to pink in YEMA with congo red and grew with an alkaline reaction in YEMA with bromothymol blue except for MAR 1510 with grew with an acidic reaction. DNA was extracted from broth cultures of the bacterial strains and the 16SrRNA gene was amplified and subjected to restriction digestion using the restriction endonucleases *Taq1* and *Hae111*. A Cluster dendogram based on restriction profiles of the bacterial strains obtained with *Hae111* and *Taq1* was constructed using Jaccard’s cluster analysis. There was high genetic diversity amongst the *Bradyrhizobium* strains used in this study which plays an important role in the survival and adaptability of a species when a species’ environment changes. A species with a large degree of genetic diversity amongst its populations will have more variations from which to choose the most fit. Moreover knowledge on the diversity within a group of strains that share a common function such as ability to form symbiosis may provide a new approach for identifying isolates that are superior with respect to rhizosphere competence and ability to fix nitrogen. The restriction patterns generated can be used as a strains fingerprint enabling the differentiation of bacterial strains where resources limit the use of other techniques like sequencing. The 16SrRNA gene fragments were also sent for sequencing at Inqaba Biotec, Pretoria, South Africa for identification of the strains to species level.

**Key Words:** *Bradyrhizobium*, restriction digestion, 16S RNA amplification

**Purpose:** To assess the extent of genetic diversity between the *Bradyrhizobium* and to generate genetic fingerprints for differentiation of the strains within the genus.

**Status:** In progress
175. Evaluation of the Effect of Urea Placement and Timing on Maize Productivity and N Use Efficiency in Sandy Soils of Zimbabwe

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ABSTRACT
Cereal production in Zimbabwean cropping is limited by nitrogen and phosphorus deficiencies. While nitrogenous fertiliser is available in various forms the lack of field optimisation of N fertiliser management systems results in N losses that reduce fertiliser use efficiency. This study therefore aimed to evaluate the effect of urea fertiliser placement and timing of application on maize N uptake and maize productivity. An on-station 3 x 3 factorial experiment was run during the 2014/2015 season in Marondera, with treatments where urea was either spot applied, banded or broadcasted at a rate of 100 kg N ha\(^{-1}\) applied once or split twice or thrice. The effect on maize grain production of the interaction of fertiliser placement and application timing was not significant (\(P = 0.16\)) while placement was significant (\(P = 0.049\)). The highest grain yields were obtained from maize that had urea broadcasted at planting (2.75 t ha\(^{-1}\)). Broadcasting urea improved maize grain yield by 120% and 89% when applied once or split twice respectively whilst spot applied urea improved maize yield by 70% and 79% when applied once or split thrice respectively compared to maize that did not receive top dressing fertiliser. Banding urea when applied once and when split twice only achieved maize grain yield increases of 29% and 28% compared to maize that did not receive top dressing fertiliser. While preliminary results comparing grain productivity suggest broadcasting urea once or twice is better than other fertiliser placement methods N uptake data is still forthcoming.

Key Words: Zea Mays, Sandy soil, N use efficiency, urea

Purpose: Improving Maize productivity and reducing applied urea losses

Status: On going

Subject: Soil fertility

Date when the study will be completed: 30 July 2016

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Enhancement of Nitrogen Fixation Capacity of Under-Prioritized Grain Legumes in Zimbabwe

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ABSTRACT

In Communal and Resettlement Areas of Zimbabwe, legume grain yields rarely exceed 0.5 t ha\(^{-1}\). These yields are against attainable grain productivity of > 5 t ha\(^{-1}\). Legumes are known to be beneficial if integrated into cropping systems at large scale, because of their capacity to biologically fix N. Grain legumes have been found to fix between 15 – 210 kg N ha\(^{-1}\) yr\(^{-1}\) in tropical systems. They complement household dietary requirements since they have high protein levels for example; between 22% and 40% in cowpea (Vigna unguiculata [L.] Walp) and soyabean (Glycine max [L.] Merr) grain legumes, respectively. They provide protein-rich high quality forage, and the various edible forms are a source of income generation at local and national levels. The significant role in soil fertility improvement derived from their capacity to fix atmospheric nitrogen is under prioritized by small-scale growers. Reasons for that include cultivation of these legumes without rhizobia inoculation or poor response to inoculation. At the Soil Productivity Research Laboratory (SPRL), inoculants for various legumes are produced, quality assessed and sold, to support grain legume production. There is however, a need for implementation of greenhouse, on-station and on-farm verification trials to check on performance of current strains on the market and to evaluate possible options to improve their nodulation and N-fixation efficacy, since the grain legumes (cowpea, groundnut and field bean) are promiscuous.

Key Words: N\(_2\) fixation, cowpea, groundnut, field bean, promiscuous nodulation

Purpose: To assess the effect of mass inoculation on biomass productivity and BNF capacity of cowpea and field bean.

Status: In progress

Subject: Soil Microbiology

Intended publication: South African Journal of Plant and Soil

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An Evaluation of the Efficacy of Symbiotic Association between *Bradyrhizobium* Strains and Groundnut Genotypes

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**ABSTRACT**

The response of groundnuts to commercial inoculation is currently poor because groundnuts are promiscuous. They are promiscuously nodulated by *Bradyrhizobium* strains of the cowpea miscellany. A greenhouse trial was carried out at the Soil productivity research laboratory in Marondera to evaluate the biological nitrogen fixation potentials of four *Arachis hypogaea* (groundnut) genotypes (Ilanda, Tern, Jesa and Natal common) and four nitrogen fixing *Bradyrhizobium* strains (MAR 1555, 1574, 411 and 1510) to identify the most effective strains and most responsive groundnut genotypes. ANOVA (analysis of variance) was used to analyze data (Shoot weight, nodule number, nodule dry weight and total nitrogen content) from the greenhouse trial. Strains MAR 1555 and MAR 1574 were the most efficient nitrogen fixers (2.6% and 2.2 % respectively) and cultivars Ilanda and Jesa had significantly higher shoot biomasses (2.4g and 2.2g respectively). The cultivar/strain combination Ilanda/1555 (3%) fixed the highest amount of nitrogen. To improve inoculation responses of groundnuts, breeding of groundnut genotypes that are not promiscuous but exclusively compatible with the inoculant strain should be done. This is because symbiotic relationships involving rhizobia depend on chemical signals between the two organisms. These signals define the rhizobia–host specificity in the relationship. Therefore selecting for the optimal combination of the rhizobia and the host will result in more effective symbiosis and better growth of the host plant. Stress tolerant strains should also be identified as a competitive and persistent rhizobial strain will not express its full capacity for nitrogen fixation under stressful conditions like salinity, unfavourable soil pH and temperature extremes.

**Key Words** *Arachis hypogaea* L., *Bradyrhizobium*, cultivar-strain interaction

**Purpose:** To increase biological nitrogen fixation by groundnuts

**Status:** In progress

**Subject:** Soil fertility

**Intended Publication:** Bayero Journal of Pure and Applied Sciences

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ABSTRACT
Productivity of grain legumes on sandy soils of southern Africa is critically limited by marginal fertilisation. Effects of co-applying phosphorus (P)-based mineral fertilisers and organic nutrient resources to cowpea (Vigna unguiculata (L.) Walp.) and soyabean (Glycine max L.) were investigated on smallholder farms in eastern Zimbabwe over two years. Over 70% of the surveyed farmers grew cowpea without fertilisation. Fertilisation of legumes with one or more nutrient resources increased shoot biomass productivity by between 20% and 300% relative to the non-fertilised control. Fertilised soyabean and cowpea yielded 2.2 t grain ha$^{-1}$ and 2.5 t grain ha$^{-1}$, respectively, translating to more than double the yields of unfertilised controls. In contrast, sole application of either mineral P-containing fertilisers or organic nutrient resources yielded less than 1 t ha$^{-1}$ legume grain. The effects of combined organic and mineral fertilisation were also reflected in increased CO2-carbon evolution from soils following growth of the legumes. Under the same soils, net nitrogen (N) mineralisation was highest where cattle manure was co-applied with an NP-containing fertiliser, with at least 85 mg N kg$^{-1}$ soil released within six weeks. Co-application of organic and NP-containing fertilisers significantly enhance legume grain yields and residual soil N availability, but most smallholder farmers do not currently use this fertilisation strategy.

Purpose: To investigate effects of co-applying phosphorus (P)-based mineral fertilisers and organic nutrient resources to cowpea (Vigna unguiculata (L.) Walp.) and soyabean (Glycine max L.).

Status: Completed

Subject: Soil Fertility

Publication: South African Journal of Plant and Soil

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Great Zimbabwe University

179. Christian Women’s Experiences of Domestic Violence in Zimbabwe

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ABSTRACT

This study investigated Zimbabwean Christian women who had experienced domestic violence with a view to finding out the forms of violence these women experienced at the hands of their male intimate partners. The qualitative investigation was informed by the feminist paradigm. Data were collected, by means of in-depth semi-structured interviews, from 22 Christian women who were purposefully selected. The women were aged 18 and above and stayed in and around urban Masvingo, Zimbabwe. Data were analyzed thematically. The study revealed diverse but interrelated forms of domestic violence, namely, physical, verbal/emotional, sexual, and economic. Knowledge of forms of domestic violence could assist social workers to come up with relevant intervention strategies to curb domestic violence. Further research going beyond the scope of the current one would enrich an understanding of domestic violence in the form of intimate partner violence.

Key Words: Abused Christian women, domestic violence, Zimbabwe Domestic Violence Act.

Farmers’ Perceptions on the Impact of Dams on Livestock Dynamics in Drought-Prone Initial Resettlement Schemes: A Case of Mushandike (Masvingo)

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ABSTRACT
A study was carried out to investigate farmers’ perceptions on the impact of Mushandike dam on livestock dynamics in an initial resettlement scheme, located in a drought prone area. The study focused on farmers resettled in Mushandike resettlement scheme who depend on a dam located upstream in Mushandike Sanctuary, Masvingo. Data were collected through focal group interviews and structured questionnaires that were administered to local farmers and agricultural extension workers. Farmers were selected from the 9 villages in Mushandike resettlement scheme. More than 70% (42) of the interviewees perceived that cattle numbers had decreased during the past 12 years, despite the presence of dam. Donkeys (90%) and goats (100%) were generally perceived to have increased over the same period. A large majority (80%) reported that the dam had little impact on cattle production, mainly due to equitable allocation of the water resource. Chief among perceived causes of low cattle population trends were reduced water flow, frequent droughts and loss of grazing areas. Surprisingly, very few (2%) respondents pointed out the impact of climate change on livestock population dynamics. Reduced water flow in canals to the villages and competing water resource demands impacted negatively on cattle production. This study concluded that in the face of competing water resource claims and the climate change phenomena, cattle production is at risk.

ABSTRACT
This paper aims to investigate the factors affecting adoption of Mobile commerce in the banking sector of Zimbabwe and thereby come up with a Mobile Banking adoption model that can be used by business and service providers in Zimbabwe. It will further identify the key motivators and inhibitors for consumer acceptance of mobile phone banking (M-banking), particularly those that affect the consumer’s attitude towards, and intention to use, this self-service banking technology. As it is Mobile Banking is still at its infancy stages in Zimbabwe and vast opportunities still exist in this market. Extensive literature review of various theoretical frameworks like the TPB, TRA, TAM, TAM2, Diffusion of Innovation etc., were used as a basis for the construction of the model. Questionnaires were also administered to gather people’s perception and behaviors towards the use of Mobile Banking services. The findings of the research was a combination of various models which include the TRA, TAM plus an extension subjective norm, and TPB model. Trust, Socio Economic background and culture, Government policies and Cost were also be added as constructs to the research model. The model remains a framework which however has to be tested.

Key Words: Mobile Banking, TAM, TPB, TRA, Zimbabwe

ABSTRACT
This paper made an attempt to highlight what Acid Mine Drainage is as well as the possible management and control methods employed in the mining sector where AMD is a problem. Acid Mine Drainage is an environmental pollutant of major concern throughout the world. The mining sector is responsible for the contamination of the environment through its release. It is generated through the mining of sulphur-bearing ore deposits. This exposes sulphidic rocks to surface water and oxygen which accelerates oxidation, leaching and release of metals and generation of the Acid Mine Drainage. It is characterized by a pH of 2 or less, total dissolved solids (TDS) in the order of 4000-5000mg/l, high Fe content, high Al and Mn concentrations and a high sulphate content. In terms of management and control of AMD, the objective is to satisfy environmental requirements using the most cost-effective techniques. There are three key strategies in acid mine drainage management, namely: the control of acid generation process, control of acid migration and the collection and treatment of AMD. The paper also added a fourth one which has been shown to be effective in the management and control of AMD. This involves AMD treatment through co-disposal with Coal ash. Using this co-disposal method, most metals were removed by approximately 100 % when the pH of minimum solubility of hydroxides was achieved. Sulphate removal was found to be approximately 80 % due to gypsum precipitation.

Key Words: Acid Mine Drainage, Co-disposal, Sulphidic Rocks, Coal Ash, Neutralisation, Water Chemistry, Acid Migration.

Bedroom Politics, the Social Media Ulcer: An Application of the *Unhu/Ubuntu Philosophy* In Light Of the Technological Determinism and Cultural Imperialism Theory

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**ABSTRACT**

This paper strove to ascertain whether local social media platforms that focus on dating and sex issues are eroding the cultural values and norms of the Shona people and the push factors for such uses. While it is unprecedented that the developing countries have been importing hardware and software from advanced countries, the implications this has on social values and norms is worth an academic enquiry. The empowering, liberative and emancipatory nature of the internet and social media is undoubted when it comes to the enhancement of democratic participation and diversity of views in the "electronic public sphere," it is the uncontrolled content production’s consequences for the humanness and moral value of the Zimbabwean community that is at stake. The study has made use of the Lurking Garanyanya, the Technological Determinism and Cultural Imperialism Theories in its application of the unhu/ubuntu philosophy in an academic endeavour to determine the user-friendly nature of the social media with regards the Shona conception of bedroom politics." The enquiry has established that issues dealing with sexuality have for time immemorial been a private matter and public reference to sexuality is anathema to the Zimbabwean audience.

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Patterns of Social Media Usage amongst the Marginalized Rural Zimbabwean Peasants: The Case of Bikita

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ABSTRACT

It is an undisputed fact that politicians, the media, experts and opinion leaders dominated political debate prior to social media, however it is not clear how social media has altered or fostered participation by all in the public sphere. It is also undisputed that news in most parts of Africa was urban-centric and the rural folks were mainly forgotten, marginalized and often ignored. In Zimbabwe the traditional barriers of poverty, lack of infrastructure, censorship, intimidation and fear to express opinions in public date back to colonialism and affected rural peasants the most. The coming of independence changed little as the rural areas were largely marginalized. However, mobile telephony service providers have since 2009 managed to widen the reach of internet services in the country as one only needs to be in possession of a requisite handset and sim card. As a result more rural people now have access to social network sites especially, Facebook. This paper thus sought to investigate whether the marginalized rural peasants have been empowered by social media or the marginalization has resurfaced in new dimensions. This was made possible by looking at patterns of Facebook use in rural Zimbabwe. Interviews and observation were used to ascertain the emerging communication dynamics associated with the use of social media by marginalized rural communities in the democratic process. The study found out that the majority of the middle-aged and elderly rural peasants unlike the young generation do not have access to the internet as they prefer less sophisticated internet incompatible mobile phones since they are internet illiterate.

2014, IOSR Journal of Humanities and Social Science (IOSR-JHSS), 19(8), pp. 61-66
Shona Religion Holistically Portrayed: Selected Mutswairo Novels

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ABSTRACT
This presentation examines the portrayal of how Shona religion is holistically interrelated with other aspects of life in Zimbabwean novelist and poet Solomon Mutswairo’s selected Shona novels, Feso (1956) and Mweya waNehanda (1988). Mutswairo was a professed Christian, and a son of a dedicated Salvation Army missionary officer. He does not portray Shona traditional religion in the traditional Eurocentric image of Africa as barbaric, savage and pagan as done by most European writers with a strong Christian religious background do. In his novels, he demonstrates how Shona religion is holistically interrelated with other aspects of life, and how all phenomena are divinely inspired and pregnant with spiritual significance. He shows that African religion is characterised by various aspects (God, ancestral spirits, spirit mediums, traditional healers, etc.) and that it plays many significant roles in life, such as: uniting people, providing answers to challenges faced in life, safeguarding peace among people, as well as providing platforms for self-entertainment. Informed by the theory of Afrocentricity, this composition strives to demonstrate how some of the learned people of African heritage like Mutswairo, despite growing up in a devout Christian family, have become champions of promoting and protecting Shona traditional religion and African interests from Europe’s concerted effort to destroy Africa, and her institutions.

Key Words: Shona traditional religion, Afrocentricity, spirit medium, ancestors, n’angas

186. Africana Womanism and Shona Children’s Games

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ABSTRACT

Africana Womanism has been hailed as a theory meant to give a fuller and more realistic explanation of gender relations of men and women of Africana descent. Characterised by a number of tenets, it has been presented by Hudson-Weems as one that explains male-female relations from the context and history of African culture. Before wholly embracing it as ‘the theory’ that succinctly explains and illuminates male-female relations of all African people, it is important to examine whether it also approximates gender relations among the Shona of Zimbabwe. This paper thus makes a juxtaposition of the tenets of the Africana Womanist literary theory and the male-female relations obtaining among the Shona in relationship to children’s games with intent to ascertain the applicability of the theory to particular African situations.

ABSTRACT
African poverty has continued to haunt modern researchers and citizens. As one of their many duties, Shona writers have also focused on this reality, giving the causes of poverty, its effects and the ways of alleviating it. This paper discusses Hwendaenda’s vision of poverty in rural Zimbabwe in his novel, *Mubairo* (1993). It exposes whether the writer has been able to identify the root causes of such poverty among contemporary Shona as well as the ways he suggest to alleviate it. It strives to establish if writer has moved away from the popular but mythical victim-blame motif espoused by earlier Shona writers. The paper observes that in his novel, the writer fails to satisfactorily explain poverty in rural Zimbabwe since he blames it all on individual character traits like laziness and beer-drinking. Using the Afrocentricity theory, the paper posits that the writer fails to explain such poverty in the context of African history.

Tradition or Misconception? Contemporary Perceptions about Working Women in Midlands Province in Zimbabwe

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ABSTRACT
Contemporary debate on gender equality in Zimbabwe observes that most African women today continue to have little space, power, respect and occupy comparatively lower positions in the social, economic, religious and political spheres. Blame is placed on African tradition which is believed and is usually shown to work to the detriment of women. In the Midlands Province, women that are in gainful employment are seen and considered in negative terms as, not-good-enough for the posts they hold, poor managers and decision-makers, gaining promotion through granting sexual favours to men, among others. Most of the respondents blamed such negative perceptions on Shona culture which they say has always worked to women’s disadvantage since time immemorial. Using the Africana Womanist and Afrocentricity theories, this paper observes that indigenous Shona people’s tradition is largely blamed for what is not, and was never its way of doing things. Rather, it contends that due to the fact that the Shona of Zimbabwe were under colonial domination for nearly a century, there are higher chances that people no longer have a clear sense of what really was their own way of doing things and how different it was from that which was born out of colonisation.

Key Words: Misconceptions, African Culture, Colonial, Contemporary

Deploying a Sense of Plausibility in Language Choice: The Role of English-Shona Code Switching In Zimbabwean Classrooms

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ABSTRACT
Despite calls for the upgrading of Shona and Ndebele into languages of learning and teaching in secondary schools in Zimbabwe, and for the teaching of the so-called official minority languages, things have virtually remained unchanged in terms of the language of learning and teaching being used in the schools. English continues to dominate the role of medium of instruction. It is becoming more and more apparent in Zimbabwe that government calls for the use of indigenous languages as languages of learning and teaching in secondary schools have not been complemented by practical action. However, appealing to their sense of plausibility, teachers have reined in the indigenous languages into their classroom practice, through code switching, realising positive results in the process. The teaching of previously marginalised so-called minority languages is also steadily growing, particularly at tertiary level. Through observation of classroom practice and interviews in 10 secondary schools in the Masvingo District of Zimbabwe, it emerged that English-Shona code switching helped teachers achieve content transmission and classroom management goals. It emerged that the teachers have innovatively carved a momentous niche in a language policy environment that continues to effectively marginalise indigenous languages from the classroom.

Key Words: Zimbabwe, code switching, language of instruction, sense of plausibility, Shona,

ABSTRACT
This study investigated motivations for prostitution among female students in institutions of higher learning in Zimbabwe. The main purpose was to capture reasons why some female students engage in prostitution in the face of immense challenges of the risk of acquiring sexually transmitted diseases and the deadly HIV and AIDS virus. A prostitute in the traditional African culture and the current Zimbabwean society is not only viewed with a lot of suspicion, but is regarded as immoral and a social deviant and misfit, yet prostitution is dramatically on the increase in institutions of higher learning in Zimbabwe. This therefore calls for a thorough interrogation of the motives behind prostitution of female students. Using structured interviews and open and close questionnaires and focus group discussions, 180 female students and 30 male students were identified through purposeful, non-random sampling process in an institution of higher learning. The study was taken in the period September 2009 to June 2010. The study found out that female students engage in prostitution because of poor family background, compounded by increased economic hardships currently being experienced by most Zimbabweans. Most of them said they were motivated to prostitution to raise money for fees, accommodation, typing of assignments and dissertations, and their general welfare. The first category of these University prostitutes comprises of those who are motivated by the daily demands of the stomach, because it is common knowledge that the stomach does not entertain appeals to reason and justice, but food. The main reason for prostitution therefore was poverty. The second category of prostitutes is made up of those who may be soundly funded by their guardians, but experience challenges in writing and passing assignments, dissertations and examinations. This sophisticated class of prostitutes thrives on luring lecturers and bright male students and exchanges sex for good grades. The third category of female students who prostitute is for the sexual variety, pleasure and satiation. The study recommends that the Government funded assistance in the form of cadetship should be made more accessible to students in financial need. Institutions of higher learning should put in place programs that can empower students financially by offering vocation placements and engage in income generating projects on a large scale spearheaded by students. On the other hand, parents and guardians should ensure that they provide adequate money for those they are responsible for. The institutions of higher learning could also go a long way by ensuring that adequate on-campus accommodation is provided for their student population.

Key Words: prostitution, female students, Zimbabwe, higher learning institutions

ABSTRACT
The land question has a long history in Zimbabwe, and has always been an issue at the heart of Zimbabwe’s struggles for national liberation (Chimurenga). Stretching from the colonial era to the present, there have been three milestone Chimurenga wars, notably in 1896-1897, 1965-1980 and 2000-2008. The indigenes have perceived these wars as emanating from the land question, and this is how the land issue has been contentious and thereby placing Zimbabwe under an international spotlight. The study concurs with universal acclamation that land is an inalienable birth-right linked to notions of national sovereignty and a search for identity. Yet from the Western standpoint, the land reform programme has been misconstrued as a source of racial animosity and unprecedented human rights abuse. This study posits that the land reform programme in Zimbabwe reflects a continuation of the wider African struggle against neo-colonialism. In terms of methodology, the researchers carried out fieldwork in resettled former white commercial farms in the Masvingo province of Zimbabwe. Data was collected through in-depth interviews, observations, and from print and electronic media. From a theological perspective, the paper critically discusses land audit revelations in Zimbabwe beyond the third Chimurenga. In addition, the research configures the viability of land reform processes, and makes an appraisal of the political mud-slinging that characterise the operations of the government. Apparently, the political developments in Zimbabwe have had a bearing on the diplomatic relations in Africa, at large, and the effects of the controversial land reform programme are linked to the imposition of sanctions. The study concludes that far from being over, the land issue in Zimbabwe remains a contentious challenge.

Key Words: Land Reform, Sustainable Development, Pan-Africanist, Theology, Third Chimurenga, Zimbabwe Crisis.

An Analysis of the Export Performance of the Timber Sector of Zimbabwe

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ABSTRACT
Export performance is the growth in exports in relation to a country’s export market growth. Since 1980, Zimbabwe national production statistics has never shown a smooth trend in the performance of the timber sector on the global markets as measured by export intensity. In this study, the main influences of export performance of the timber sector in Zimbabwe were investigated. The research utilises the ordinary least squares regression technique. The study adopted the model used by Wu and Cheng (1999) and modified it to suit Zimbabwe. Timber exports (EXP) are modelled as a function of Zimbabwe foreign direct investment (FDI), inflation rate (INF), previous exports (EXPt-1) and drought. The results of the study suggest that foreign direct investment, drought, inflation and lagged exports influence Zimbabwe’s timber sector export performance in Zimbabwe.

Key Words: Manufacturing sector, foreign direct investment, Drought, Export performance, Lagged exports, Inflation

An Analysis of Corporate Governance in the Banking Sector Of Zimbabwe

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ABSTRACT
The study looks at the effect of corporate governance issues in the banking sector of Zimbabwe. This study consisted of 25 respondents, from compliance departments of selected banks. From the findings it can be concluded that corporate governance plays important function in stabilizing the banking sector and well functioning of the commercial banks in Zimbabwe. The study recommends that the corporate governance board should make sure that banks should practise a culture of good corporate governance on regular basis and deal with those who fail to comply to good corporate governance.

Key Words: Corporate governance, Banking sector, Compliance, Risk management.

(2014), Humanities and Social Sciences, 2(3), pp. 174-180
ABSTRACT
The study investigates the impact of labour on economic growth in Zimbabwe. The research uses a simple Ordinary Least Squares regression modeling method. The results suggest that labour and capital impact positively on Zimbabwe’s economic growth. The study recommends the government to pursue an employment-intensive strategy. It also recommends the government to develop an education and training system geared towards employment creation.


ABSTRACT

Purpose: The purpose of this paper is to discuss the effectiveness of Ecofarmer in Zimbabwe. The effectiveness of Ecofarmer still needs to be established since it is a new product that is hardly a month old.

Research design, Data, Methodology: The paper follows qualitative research methodology and an exploratory approach to establish the effectiveness of Ecofarmer in the promotion of productivity in the agricultural sector in Zimbabwe. Using internet-based literature review, the paper explored the link that exists between Econet’s Ecofarmer programme and agricultural development in Zimbabwe.

Results: The findings are that the innovation promotes agricultural productivity. This is in line with what was established by Safaricom Foundation in Kenya.

Limitations: The paper used literature sources since the phenomenon is exploratory. This has had a limitation that could have been avoided using a field survey.

Conclusion: The paper shows that the Ecofarmer is an innovative project that was developed by Econet as a replicator of the Kenyan programme.

Type of paper: Short communication.

Key Words: Farming, Ecofarmer, agricultural development, productivity, Zimbabwe.

ABSTRACT

The purpose of this paper is to evaluate the validity and feasibility of ‘cattle banking’ as an alternative innovative financing strategy in Africa with specific reference to Zimbabwe. ‘Cattle banking’ has entered the debate on innovative financing for rural areas. In Zimbabwe, TN Bank (now Steward Bank) has taken the ‘bull by the horns’ through introducing the new strategy to farmers who are mostly rural. Cattle are very important assets in the rural areas despite the challenge of climate change and global warming that have direct negative effects on pastures. This is an exploratory paper that uses literature sources to garner information relating to ‘cattle banking’. Preliminary results show that ‘cattle banking’ has the potential to assist farmers to open bank accounts using cattle, thus encouraging them to save their assets. ‘Cattle banking’ promotes asset-building among farmers. Many farmers in the rural areas of Zimbabwe do not have bank accounts because of what they experienced during Zimbabwe’s “lost decade” (2000-2010) when bankers lost millions of dollars to the hyperinflation. This paper recommends that cattle banking should be developed as it has potential to uplift the livelihoods of rural farmers. It is also seen as an innovative strategy to overcome rural finance challenges.

Key Words: Rural finance, innovative finance, cattle banking, Zimbabwe.
ABSTRACT
The main aim of this paper is to propose the development of a new microfinance model that can approximate sustainability in Zimbabwe. The secondary purpose is to find out whether the same model can be replicated in other developing countries. The paper adopted a mixed methodology. A cross-sectional data collection method was preferred because data was collected during the time of high volatility in the country. Questionnaires, interview schedules were combined to collect data from villagers involved in microfinance programmes. Data were collected from 250 households in the Masvingo rural district area of Zimbabwe. The findings show that the two polar models are biased, hence the need for the ‘middle of the road approach’/‘hybrid model’ for the provision of microfinance services to the poor in order to achieve the twin objectives of poverty alleviation and sustainability. The paper is limited to Masvingo district of Zimbabwe, thus replication could become a challenge. This article attempts to develop a ‘middle of the road’ model for microfinance in Zimbabwe. According to our knowledge, there is no study that has attempted to do the same.

Key Words: Microfinance, poverty alleviation, sustainable development, microfinance model, Zimbabwe.

Conceptualizing Microfinance for Effective Smallholder Farming In Africa

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ABSTRACT
Smallholder farmers in Africa desperately need pro-poor interventions to alleviate their poverty through self-sustenance. In Africa, poverty is more prevalent in rural areas, where the overwhelming majority (about 80%) of Africa’s population lives and about 72% are poor. Microfinance cannot have substantial impact on poverty until it significantly penetrates the rural areas where small-scale agricultural activities by smallholder farmers need financial support. This paper thus attempts to conceptualise microfinance for smallholder farming in Africa which is done from the integrated view as opposed to a minimalist view. The integrated view was selected because it focuses on the provision of credit facilities plus related follow-up services such as training, whilst the minimalist view is concerned about giving credit only. The paper relied on literature review and digestion to conceptualise microfinance as a strategy for boosting smallholder agricultural production. Many rural farmers have no access to the traditional financial system. Therefore, basic financial services are essential for the management of their productive endeavors. This paper argues that microfinance plays a pivotal role in the commercialisation, not only of smallholder farming activities but also the successful implementation of agricultural ideas. Microfinance is one way of helping farmers to sharpen their agricultural ideas so as to promote rural economic development. With this background it has become imperative to explore the commercialisation of rural agriculture so as to empower the farmers. The financial sector in most countries does not cater for rural finance because they require physical collateral security that rural people do not have. In this article, micro-finance is seen to be a useful intervention that can be employed to economically empower the agricultural sector.

Key Words: Microfinance; Inter-Mediation; Smallholder Farming

2014, International Business & Economics Research Journal, 13(6),
ABSTRACT
The purpose of this paper is to analyse the challenges of rural tourism development in Zimbabwe. The paper uses the qualitative research methodology, and a case study research design. A case study of Great Zimbabwe in Masvingo district of Zimbabwe was used. Face to face interviews and focus group discussions were used to collect primary data. Purposive and convenience sampling techniques were employed to select respondents. The findings of the study show that there is lack of sustainable interventions and promotion strategies for the development of rural tourism. Most studies have approached tourism development in terms of its quantitative aspects. However, this study seeks to understand rural tourism development through a qualitative approach which brings an in-depth understanding of the socio-economic dynamics experienced by rural people. Such dynamics can be difficult to identify if a quantitative approach is employed. The study established that factors such as political instability, community conflict, lack of finance, poor communication, and limited knowledge are responsible for the absence of strategies to promote rural tourism. All the aforementioned reasons complement each other and pose a challenge to the sustainability of rural tourism development. To transform rural areas through tourism, it is imperative for the government of Zimbabwe to develop rural tourism strategies and policies.

Key Words: Rural tourism, tourism development, rural development, challenges, Zimbabwe.

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The Role of Microfinance in Right-Based Approach to Food in Africa

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ABSTRACT

The purpose of this paper is to explore the role of microfinance to food security using the lens of the Right-Based Approach to food. The paper adopts a qualitative research methodology, following an exploratory research design. The research findings show that microfinance has a positive contribution towards rights to food and food security. However, in other African contexts, microfinance is worsening the status of the poor. It was thus established that proper management of microfinance programs is likely to bring more benefits than problems. Making the ‘right to food’ and the ‘right to credit’ aspects of human rights will strengthen the productive systems of food to ensure sustainable supplies for effective food security mechanisms. The paper recommends that the linkage between microfinance and food rights be escalated to policy level discussions. Policies that promote a combination of the two rights need to be developed.

Key Words: Microfinance; Rights-based approach; Food security; Right to food; Right to credit.

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Microfinance and Poverty Alleviation: An Empirical Reflection

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ABSTRACT
The purpose of this paper is to carry out an empirical analysis of the link that exists between microfinance and poverty alleviation. The analysis is driven by literature searches on empirical works done by different researchers in different contexts. Qualitative research methodology was adopted, following a desktop approach. An empirical literature review took a centre stage in this investigation. An analysis of empirical works shows that microfinance enhances poverty alleviation despite the challenges such as the Indian Andhra Pradesh crisis. The paper is limited to a review of empirical sources of literature. A field survey, supported by an econometric analysis would have helped to generate robust results. This paper attempts to bring together the empirical works that were done in different contexts to shed light on the important relationship between microfinance and poverty. Many research works on microfinance depend upon personal anecdotes, thus this present paper attempts to compile the scattered empirical findings on microfinance and poverty alleviation.

Key Words: Microfinance, Poverty, Poverty Alleviation, Empirical Review, Zimbabwe

The Impact of Intra-Regional Country to Country-Bilateral Trade Agreements on Trade Flows between Zimbabwe and Its SADC Trading Partners

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ABSTRACT
As part of an overall package, open and more liberal trade policies are increasingly being regarded as the main route towards economic growth and development in this fast globalising world. A number of initiatives, including the establishment of a various forms of free trade agreements, have been taken by various countries eying improved terms of trade. This study is an assessment of the ex post bilateral trade effect of Zimbabwe’s country to country bilateral trade agreements with its SADC trading partners. The major objective was to find out whether the bilateral trade agreements have been trade creating or trade diverting. Using a country-specific fixed effects panel data estimation of the gravity model of bilateral trade involving a sample of 10 countries (Zimbabwe and its 9 trading partners- Botswana, DRC, Madagascar, Malawi, Mozambique, Namibia, south Africa, Tanzania and Zambia) from 1980 to 2012, the results show that the country to country bilateral trade agreements have been trade creating and expanding. Another important finding of the study is that trading partners’ multiple-membership to regional trade agreements has been constraining bilateral trade. The results therefore indicate that Zimbabwe should negotiate for more bilateral trade agreements especially with closer countries such as Zambia, Lesotho and Swaziland. More importantly, it adds voice on the calling for the coming into effect of the establishment of the COMESA-EAC-SADC FTA.

203. Challenges for Urban Water Supply: The Case of Masvingo Municipality in Zimbabwe

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ABSTRACT
The problem of water scarcity in urban areas of developing countries is a major concern. The daily water supply rate in the developing countries is very low compared to the industrially developed countries. The objective of this paper was to determine the main challenges for urban water supply in Masvingo city in Zimbabwe and give policy recommendations on how these challenges can be addressed to improve water delivery services in the city. Structured questionnaires were used to collect information on water challenges from municipality workers. The study identified population growth, poor infrastructure, economic challenges and climate change as the major challenges affecting efficient water delivery in Masvingo city.


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ABSTRACT

The debate on who is employed and jobless in Zimbabwe has taken centre stage after 2008, with variations ranging from definitions and motives of the source. The subject of unemployment incorporates issues of the nature of tasks being done coupled with the driving force behind a person to join a particular sector, formal or informal. This paper looked at the effect of formal unemployment to output and the growth of the informal sector. The paper proved that the continual collapse of the formal sector is the forcing factor behind a thriving informal sector in Zimbabwe. Thus the informal sector accounted for over 89% of employment in Zimbabwe by 2013. Due to lack of clear operational framework, and limited resources that characterised the informal sector, the economy has lost millions in potential government revenue, national output, international competitiveness, and hence, it has become a trading market place. The paper recommends the Government to urgently restore investor confidence through creation of a conducive economic environment.

ABSTRACT
This paper aims at assessing the main causes of informal sector in Zimbabwe since independence through literature review. The paper discovered that internal migration (rural to urban), economic slide, wealth creation and tax evasion are some of the main causes of the rapid growth of informal sector and the subsequent decline of the formal sector, in Zimbabwe. The informalization of the economy results in government revenue reduction, collapse of the formal sector and corruption; while identified benefits include creation of employment, as well as lower costs of commodities.

2014, Research Journali’s Journal of Commerce, 2(4), pp. 01-09
ABSTRACT
The study seeks to ascertain the teachers’ perceptions after the withdrawal of incentives by the government. After reading the article in The Herald of 24 April 2014 that the government has banned the payment of incentives to the teachers, the researcher was prompted to investigate the teachers’ feelings. Prior to this study the research once carried out the study on the impact of incentives to the teachers. The study had indicated that the incentives had energized the teachers to execute their duties earnestly. The researcher then wondered how the same teachers were going to behave after the withdrawal of incentives. This led the researcher to solicit information from the horse’s mouth to validate their feelings. A case study was carried out through the incidental methodology. Twenty university students and five parents were interviewed. The results showed that teachers from rural areas really welcomed the idea since they were not contented with the incentives they got. Teachers from urban setup were grumbling for they acknowledged that they were moving a mile ahead with the incentives. The researcher recommended that incentives ought to be reintroduced if the school fees are not reduced.

Key Words: Incentive theory, reinforcement, operant conditioning, motivated, quitting, diligently, perceptions, incidental methodology

Endogamy is marriage within one’s social or cultural groups. There are two universal categories of marriage partner selection restrictions referred to by anthropologists as exogamy and endogamy rules. Exogamy rules require that marriage be outside of some defined social groups while endogamy requires it to be within some large groups such as local communities. Exogamy tells you whom you should not marry and endogamy tells you who would be accepted and preferred as your life partner. Social distance is the key factor here. All cultures have norms that specify whether a person brought up in that culture should marry within or outside one’s cultural group. Research shows that in societies such as the United States of America ethnic and religious groups normally put pressure on their members to remain endogamous. These rules tend to be strong especially for women. Many societies have explicit or unstated rules which define potential mates as acceptable or unacceptable. This paper will examine the strengths and weaknesses of the endogamous marriage patterns which are within different types of endogamous division and as it also applies to Zimbabwe. An overview of endogamy marriage will be highlighted after its brief definition. This information is based on related literature and the author’s experience.

2014, IOSR Journal of Humanities and Social Science (IOSR-JHSS), 19(7), pp. 114-118
Cultural Villages as Contexts for Mediating Culture and Mathematics Education in the South African Curriculum

Madusise, S.

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ABSTRACT

Some mathematics educational reform policies indicate that learners should be getting an education which is connected to their cultures. However, teaching in schools rarely brings the interconnection between mathematics and culture in pedagogically informed ways. Connections are often done superficially because of teachers’ inexperience in ways of connecting. Also, the curriculum in schools lacks content and specific strategies that enable the making of the connections explicit in the context of teaching. The study from which this paper emerges worked with three mathematics teachers in an attempt to teach mathematics in ways that connect key concepts with culture. Through mathematizing culturally-based activities performed at a cultural village, two Grade 9 mathematics topics in the South African curriculum were indigenised. A teaching unit on the indigenised topics was designed and implemented in five Grade 9 classes at the same school. The paper demonstrates that the experience of designing, implementing, and reflecting on the intervention study had some positive contribution to the participating teachers’ pedagogical repertoire. I argue that cultural villages can be used as contexts for mediating culture and mathematics education.

Key Words: Cultural Villages; Culture; Mathematics Education, South African Curriculum.

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209. Exploring the Potential of Using Cultural Villages as Instructional Resources for Connecting Mathematics Education to Learners’ Cultures

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ABSTRACT

This article examines the potential of using a South African cultural village as a site for mathematisation. Mathematics and culture are often interconnected, making school mathematics intimately linked to the society in which it is taught. However, teaching in schools rarely brings the interconnection between mathematics and culture in pedagogically informed ways. Connections are often done superficially because of teachers’ inexperience in ways of connecting. Also, the curriculum in schools lacks content and specific strategies that enable the making of the connections explicit in the context of teaching. The study from which this paper emerges worked with three mathematics teachers in an attempt to teach mathematics in ways that connect key concepts with culture. Through mathematising culturally-based activities performed at a cultural village, two Grade 9 mathematics topics in the South African curriculum were indigenised. A teaching unit on the indigenised topics was designed and implemented in five Grade 9 classes at the same school. The paper demonstrates that the experience of designing, implementing, and reflecting on the intervention study had some positive contribution to the participating teachers’ pedagogical repertoire. We argue that cultural villages can be used as instructional resources for connecting mathematics education to learners’ cultures in the South African curriculum.

Key Words: culturally-relevant pedagogy, mathematisation, indigenisation

210. Technology, a Stratifying Learning Utility: A Comparative Case Study of a Rural and an Urban Day Secondary Schools in Masvingo, Zimbabwe

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2University of South Africa, Department of Early Childhood Development, Box 392, 0003, Pretoria, South Africa

ABSTRACT

The study focused on how technology as a learning utility created a learning gap that stratified learners. Apart from establishing the learning gap that is created by technology in rural and urban day secondary schools, it sought to suggest way in which learning gaps could be minimised. A comparative case study research design which is largely qualitative was used. It permitted the researchers to describe in detail how technology created a learning gap that stratified rural and urban day secondary school learners. A sample of 48 participants comprising 4 teachers, 4 administrators and 40 learners from a rural and an urban day secondary school was purposively drawn. It emerged from the study that learners who used technology did not only outperform their counterparts but they were better prepared for their future careers. Recommendations were made for the stakeholders to facilitate the use of technology in enhancing learning in rural and urban day secondary schools.

Key Words: technology stratifies gap career learner

211. Perceptions of Zimbabwean School Girls and Their Teachers on the Extent to Which the School Curriculum for Girls Correlates With Their Career Choices

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*Great Zimbabwe University, Faculty of Education, Department of Educational Foundations, Masvingo, Zimbabwe*

**ABSTRACT**

The study explored teachers’ perceptions of the degree of association between the curriculum followed by Zimbabwean secondary school girls and their career aspirations or choices. A sample size of 40 participants comprising 20 secondary school teachers and an equal number of Sixth Form girls participated in the study. The sample was conveniently and purposively selected from eight schools in the Central Masvingo District of Zimbabwe. The study adopted a quantitative research design and utilized a questionnaire as the instrument for collecting data from the participants. The study found that the girls’ curriculum as determined by the school subjects studied at school have a great impact on their resultant career preferences. Other aspects of the hidden culture curriculum that were found to impinge upon the girls’ career aspirations include their teachers’ attitudes and expectations towards them, their socio-economic backgrounds and parental or siblings’ influences. The study concluded that the girls’ self concepts and academic achievement are influenced to a very large extent by a whole range of factors embodied in the school curriculum in both its explicit and implicit or hidden forms.

**Key Words:** Parental Influence. Teacher Attitudes and Expectations. School Subjects. School Type. Socioeconomic Background. Career Trajectories

2014, Anthropologist, 17(2) pp. 577-589
Managing Sexual Abuse of Students by Teachers. A Case Study of Masvingo District Secondary Schools in Zimbabwe

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ABSTRACT

Child sexual abuse is becoming devastatingly prominent in most schools, it is widespread but largely unrecognized problem in many countries. Schools should be a safe haven for students. Under the hand of a respected teacher students are damaged leading to immense suffering of victims and creation of a bad reputation for the teaching profession. It hinders the development of abused individuals. This paper explores sexual abuse of students by teachers in schools. The study adopted a case study design using questionnaires and semi structured interview schedule to collect data. Generally the teachers and school heads were of the opinion that teachers sexually abuse students in the school contexts. Various reasons were given why teachers commit such a criminal offence. Some of the reasons were said to be reflected in the community and wider society such as unequal power relations, and beliefs in myths such as having sex with a virgin cures HIV and AIDS. The study also found a host of negative repercussions on the victims. The participants established that sexual abuse was detrimental to the physical, social and cognitive development of the child and they suggested ways schools can implement to prevent sexual abuse of students by teachers.

Key Words: Child, Abuse, Abuser, Child Sexual Abuse, Teacher, Victim

213. Exploring Sexual Abuse of School Children in Families: A Case Study of Masvingo District, Zimbabwe

Magwa, S. & Ingwani, V.

Great Zimbabwe University, Faculty of Education, Department of Educational Foundations, Masvingo, Zimbabwe

ABSTRACT

Child sexual abuse is a social problem which spans across an individual’s physical, cognitive, interpersonal and emotional functioning. It violates the rights of children to freedom and security, privacy and integrity, health and in some cases, even the right to life. It creates fear in the boy or girl, who may be harmed for life. It is a unique phenomenon which occurs more frequently than people realise. This study aims to explore various factors which contribute to child sexual abuse in families and how schools can help protect children from the abuse. The case study design was used to collect data from parents, teachers and students using interviews, questionnaires and focus group discussions. It emerged from the study that children are sexually abused in their families as a result of the power adults especially men have over children, domestic violence, and cultural practices practised in families. In conclusion the paper suggests ways schools can help to protect children from such abuse.

Key Words: abuse, sexual abuse, contributing factor, human rights

The International Journal of Humanities & Social Studies, pp. 156-161.
ABSTRACT

Open and Distance Learning (ODL) has become an accepted and indispensable part of education systems in both developed and developing countries. The emergence of ODL within the last decade particularly via information communication technologies has altered global market structures. In a dynamic society like the Southern African region, ODL has been used for outreach programmes in remote population groups, to support school education, provision of education and training opportunities for adults’ vocational courses, higher and continuing education. Flexibility and access are clear benefits since ODL frees the student from travelling to a fixed place, at a fixed time, to meet a fixed person so as to be trained. This article aims to explore the various challenges faced by SADC Member States in the development and deployment of ODL practices. Open and distance learning in the Region faces a lot of challenges such as not having national ODL policy frameworks to regulate ODL provision, failing to meet the demand for ODL programmes due to insufficient capacity, negative misconceptions and possibility of not utilizing technology potential. The paper further aims to highlight how these challenges can be addressed at regional and national levels. In order to improve access to quality education, the SADC Secretariat has facilitated the development of an evidence based Regional Open and Distance Learning Policy Framework to support integration, harmonisation and maximisation of resources. The Policy framework provides for harmonisation of both quality and educational outputs.

Key Words: education, learner, open and distance learning, harmonisation, policy framework

ABSTRACT
Language is an important resource that should be recognised, used and cherished by all people in the world. In Africa however, learners are being systematically deprived of one of the basic human rights, that is the right to receive information and education in their mother tongue or at least in a language already known and mastered by them at the beginning of formal education. African governments and their leaders appear to be paying mere lip service to the use of indigenous languages in official functions, hence the need to revisit Africa’s language policies. This paper discusses the language policy enshrined in the new Zimbabwe constitution with a view to promote the use of indigenous languages as official medium of communication in both the public and private domains. Conceptually, the paper is based on Ruiz (1984) ideological orientations to language planning in which language is seen as both a right and a natural resource. The paper critically reviews the use and development of indigenous languages in Zimbabwe and argues for the use of indigenous languages as essential tools of communication for development irrespective of numbers of speakers. The paper makes further attempts to encourage the formation of endoglossic language policies for the African continent and in conclusion, the authors call for the formation of a national language council with a mandate to promote and develop indigenous languages and cultures of Zimbabwe.

Key Words: language; language policy; indigenous language; linguistic imperialism; language


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ABSTRACT
This study looks at the theoretical proposition of an agriculture led development in the post-2000 Zimbabwe. The paper traces the theoretical foundations of development in developing countries and revisits the critical role of agriculture in Zimbabwe. By engaging emerging literature on development and envisaging the opportunities being presented by the current development paradigm, the paper posit Zimbabwe’s future development as one which should be hinged on agriculture particularly smallholder farmers in cash crops. The rectification of the policy discord in the agriculture sector is the hallmark of this study.

ABSTRACT
This paper looks at the critical role of the State in fostering development particularly in developing African countries like Zimbabwe. By taking a retrospective historical perspective of the role of the State, the paper analyses the proposition of state intervention in markets which is pro-poor and production based. The paper critically looks at nature and character of such intervention ability theoretically, particularly at this era globalization and renewed free market enterprises. The current consensus of agriculture led development of countries like Zimbabwe requires an activist State which is predisposed on the creation of opportunities, empowering the poor. The paper concludes by positing that Zimbabwe’s future development lies not only in agriculture led development but also in a State which is neither soft nor porous to the doctrines of free market capitalism which require advanced markets.

ABSTRACT
This paper looks at the critical role of the State in fostering development particularly in developing African countries like Zimbabwe. By taking a retrospective historical perspective of the role of the State, the paper analyses the proposition of state intervention in markets which is pro-poor and production based. The paper critically looks at nature and character of such intervention ability theoretically, particularly at this era globalization and renewed free market enterprises. The current consensus of agriculture led development of countries like Zimbabwe requires an activist State which is predisposed on the creation of opportunities, empowering the poor. The paper concludes by positing that Zimbabwe’s future development lies not only in agriculture led development but also in a State which is neither soft nor porous to the doctrines of free market capitalism which require advanced markets.

2014, Russian Journal of Agricultural and Socio-Economic Sciences, 1(5), pp.3-13
ABSTRACT
The central aim of this study was to investigate the role of principals in the implementation of polytechnic curriculum strategy (PCS) in Zimbabwe. The main research question which this study sought to answer was, ‘What is the role played by strategic leadership in the implementation of polytechnic curriculum strategy?’ In an attempt to realise that end, a mixed method research design was used to collect data, making use of questionnaires and interviews. The participants included 5 polytechnic principals, 123 lecturers, 77 students and 9 company training managers. The participants were selected through purposive, stratified and simple random sampling techniques drawn from five polytechnics selected for the study. The findings suggest that most polytechnic principals are rendered ineffective in implementing the PCS. Though the principals have a sound theoretical knowledge of their roles, they however experience a litany of practical impediments. These barriers include, *inter alia*, lack of curricula knowledge in the *currere* approach, action research, Basil Bernstein’s and Paulo Freire’s pedagogical discourses and reconceptualisation of curriculum, shortage of relevant instructional resources and poorly evaluated polytechnic curriculum, low level of staff incentive, training and development. Two systemic impediments in the principals’ role of implementing PCS are: lack of autonomy in crafting and implementing PCS and lack consensus between Curriculum Research and Development Unit (CRADU) and National Manpower Advisory Council (NAMACO) in crafting policies on curriculum standards.

Key words: Action research, reconceptualisation of curriculum, pedagogising knowledge, *currere* approach, strategy implementation, strategic leadership.
From Theory to Action: The Case for Zimbabwean Polytechnic Curriculum

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ABSTRACT
The thrust of this study was to investigate the extent to which polytechnic curriculum strategy (PCS) is effectively implemented in Zimbabwe. The overarching research question was the extent to which principals could strategise in the face of changing environments craft and implement a relevant polytechnic curriculum. A qualitative research design was used to collect data, making use of and interviews. The participants included 5 polytechnic principals and 8 HODIVs. The participants were selected through purposive, and simple random sampling techniques drawn from five polytechnics selected for the study. The major finding suggest that poorly crafted polytechnic curriculum, divorced from the realities of the economy rendered the graduate ineffective in industry.

Key words: Polytechnic curriculum, strategy implementation, strategising.
ABSTRACT
Tones of fruits and vegetables are going to waste everyday in Zimbabwe when the country is focusing on food and nutrition on the national agenda. Fruits and vegetables are perishable thus the idea of designing and manufacturing a simple low cost, electric multi-fruit and vegetable dryer to preserve them for future use. The purpose of the study is to design and manufacture a low cost, electric multi-fruit and vegetable dryer with a capacity of 10kgs per load. The overarching question was how fruits and vegetables could be preserved for future use. There has been an overwhelming supply of fruits that needed drying where technology was lacking. It should consider also that vegetables dry faster than the fruits due to the difference in moisture content and therefore measures should be put in place to that effect. The design comprises a thermostat for controlling the temperatures, heating element to generate heat, a fan or blower to evenly distribute the heat within the drying cabinet and a motor for power generation. The study will make use of mixed methods to collect data from 3 Heads of department and 25 lecturers and three famers from farms around Harare who will be interviewed and complete questionnaires respectively. The multi-fruit and vegetable dryer and user manual will be designed as per user specifications.

Design, manufacture, ZimAsset, food and nutrition, multi-fruit and vegetable dryer
Towards Mobile Agricultural Information Services In Zimbabwean Libraries: Challenges and Opportunities for Small Scale Farmers in Utilizing ICTs for Sustainable Food Production

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Harare Polytechnic
Food Agricultural Organisation (FAO-Rome)

ABSTRACT
This paper explores the possibilities of mobile agricultural information services in Zimbabwe with a special focus on libraries and m-services. It analyses how traditionally experienced smallholder farmers are utilizing mobile technology to access current information relating to the market prices of crops, banking services and weather patterns (agro meteorology). The researchers explore how mobile-phone based services are providing small scale farmers opportunities to access market prices, negotiate better deals with traders and improve the timing of getting their crops to market. It also investigates the strategies that libraries are employing to provide e-agricultural library services to small scale farmers in the rural areas. The writers also seek to find out the extent to which Zimbabwe can utilize mobile services to promote access to agricultural information for small-scale farmers.

Key Words: agro meteorology; m-technologies; smart technologies and access to information

Study completed 2014.

Paper presented at: University of Cornel Ithaca New York, USA

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ABSTRACT

The study evaluated the Technical Vocational Education and Training for the hospitality and tourism programmes’ On the Job Education and Training in Zimbabwe using a gap analysis approach. The problem is attachment assessment process fails to bolster effective evaluation of students on ‘On the Job Training’ skills and competences. The overall objective of the study was to determine the challenges in hospitality and tourism courses’ On the Job Education and Training assessment tool and the On Job Education and Training assessment gaps. The research adopted a descriptive-survey research design. The study purposively sampled 80 units within study population of 98 participants namely the regulatory authorities, tourism and hospitality organizations and Technical Vocational Education and Training institutions in Zimbabwe. The study had 40 questionnaires, 25 interviews and a focus group discussion composed of 15 lecturers from Bakery, Professional Cookery and Tourism and Hospitality sections in the Tourism and Hospitality Department at the Harare Polytechnic. The response rate was 96%. The findings indicated that On the Job Education and Training assessment process’s reliability and validity is low due to inadequate facilities to measure the skills and competences through a universal assessment tool “one size fit all”. In addition, both the lecturers and the industrial supervisors lack adequate knowledge on their roles in the On the Job Training assessment. The study adopted qualitative analysis method in triangulation with quasi-statistics for presentation. The study recommends for the development of sector tailored Competence Based assessment tools that can substantively assess the skills. An “all relevant stakeholders” policy should be set in respect to roles of the stakeholders. Technical Vocational Education and Training system should bolster ‘on-site’ strategic business units. The study suggest for further researches to be done on the perception of potential employers in recruiting student from industrial attachment for work

Key Words: On the Job Education Training ; Higher Education Examination Council ; Techno-Vocational Education and Training programmes ; On the Job Education Training Assessment

Date when the research was done 05/2014
Antimony Removal By Sodium Nitrate In Lead Purification Process

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ABSTRACT
The modified Harris Process which uses Sodium Carbonate and Sodium Nitrate is currently being used to remove antimony in lead purification process used in battery manufacturing process. This study investigates the possibility of using sodium nitrate to remove antimony from lead in a lead purifying kettle. The purity of the lead obtained was 99.9% analysed by Atomic Absorption Spectroscopy which is the ideal in the battery manufacturing. The optimum temperatures were in the range of 600°C -650°C. Turnaround time was reduced from 24 hours to 16 hours. Yield was increased from 67% to 78%. Hence Sodium Nitrate can be used to remove antimony.

Key Words Lead, antimony, sodium nitrate, Harris process.

Research completed 12/2014
ABSTRACT
This work investigated the optimum parameters for the recovery aluminium caesium sulphate dodecahydrate (caesium alum) from caesium alumino silicate ore (Pollucite) obtained from Bikita in Zimbabwe by sulphuric acid leaching. The pollucite ore was characterized by AAS before leaching and after leaching. The mineralogical composition of the pollucite before leaching was found to contain of the following phases: 17.17% aluminium oxide, 25.68% caesium oxide: and 49.73% silica and less than 2% impurities of rubidium, potassium, sodium, lithium and iron. Batch optimisation studies were carried out to investigate the effects of process parameters namely leaching time and acid concentration at a constant temperature. Pollucite particles of -200 mesh size were digested in sulphuric acid at 100°C with a 30-55% solution of sulphuric acid within a time frame of 1 – 6hs. Acid digestion was followed by hot water wash and vacuum filtration. Caesium alum was crystallized from the leach filtrate by stage cooling to room temperature. Optimum conditions of at least 90% mass recovery of caesium alum with caesium content of at least 23% analysed by AAS after leaching were, leach time of 4h at 100°C and acid concentration of 40%. Hence it is possible to recover 90% caesium alum from Bikita pollucite ore with at least 23% caesium content.

Key Words: pollucite, caesium alum, caesium, leaching

Research completed 10/10/2015
An Investigation into the Role of Technical and Vocational Education and Training (TVET) For Socio-Economic Transformation through Value Addition and Beneficiation. Case Study of Harare Polytechnic’s Mechanical Engineering Division

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ABSTRACT

The extant Technical and Vocational Education Training (TVET) literature in Zimbabwe contains fewer studies that have examined the role of TVET in socio-economic transformation particularly in relation to value addition. This article aims to explain the role of TVET in relation to value addition and beneficiation in Zimbabwe using Harare Polytechnic’s Mechanical Engineering Division as a case study. TVET is defined as any education, training and learning activity leading to the acquisition of knowledge, understanding and skills which are relevant for employment or self employment. Any country that evolved into a technological advanced stage, TVET must have played a critical role as skilled human capital would have been required to enable its realisation and sustainability. This paper seeks to answer why Zimbabwe is considered to be one of the countries with the highest literacy on the African continent and yet remains a net importer of goods and services. The researcher will further examine the raison d’être why goods being imported are ordinarily those that the country is expected to be either manufacturing or value adding and then exporting. The paper examines the relations between a country’s investment in technical and vocational education and training and its growth and development. The researcher will focus on Industrial Manufacturing Engineering (IME) and how it can leverage ZIMASSET. The researcher used a qualitative methodology which involved the use of questionnaires and interviews for data collection in the field of study.

Key Words: Technical Vocational Education and Training (TVET); Competency Based Education and Training (CBET); socio-economic development and ZIMASSET

The study was completed on 12 February 2016.
Empowering The Citizens: The Potential of Zimbabwean Library and Information Science Schools in Contributing towards Socio-Economic transformation

Collence Takaingenchamo Chisita, Munyaradzi Shoko

ABSTRACT
Library and Information Science Schools play significant roles in socio-economic transformation but in most cases they are downplayed or overshadowed by other institutions, and professions. Currently Zimbabwe boasts of high literacy rate in Africa and this success would have been impossible without the contributions of library schools and related institutions. Libraries and librarians are at the epicentre of socio-economic development and their role cannot be downplayed. It is out of this context that the writer will explore the extent to which library schools are contributing towards socio-economic transformation, for example, human capital development and facilitating access to information. The writer will seek to explain and clarify how LIS schools are engaged in socio-economic transformation through supporting education and culture through community engagement. The paper will examine the LIS education models, for example, general education and Technical Vocational Education and Training (TVET) or Competency Based Education and Training (CBET). It will also seek to find out how LIS Schools are contributing to the information/knowledge economy through education, training and research. The writer will also seek to find out how LIS Education is responding to socio-economic and political dynamics in Zimbabwe amidst forces of globalisation and cultural identities. Furthermore, the writer will explore the extent to which LIS education can help to reposition Zimbabwe in the global knowledge economy. The writer will examine how LIS schools integrate culture and technology.

Key Words: development, information/knowledge economy, culture, empowerment, collaboration, globalisation

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Conference Location: Jeddah, Saudi Arabia

Conference Dates: January 26-27, 2015

World Academy of Science, Engineering and Technology International Journal of Educational and Pedagogical Sciences Vol: 2, No: 1, 2015 International Science
228. Formalising the Informal Sector through Human Capital Development. A Case Study of Road Passenger Transport SMEs in the CBD of Harare

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ABSTRACT
In spite of the informal sector’s role as a major employer of labour and source of income for many in Zimbabwe very little research has been done to formalise it. This paper investigates what causes Informal Road Passenger Transport (IRPT) operators to operate illegally. It is done to propose training methods that will formalise these SMES.

Methodologically, an analysis of secondary data including published journals, books, newspaper and manuscripts was employed. This was augmented by a series of primary data collection inter alia observation, photographing, and unstructured interviews with informal actors and transport lecturers.

The study concludes that while the informal sector can be seen as “an employer of last resort” for some, a significant number of traffic ills were revealed. Transport woes in today Harare range from high accidents rates, congestion, pollution and shortages. In addition to that IRPT operators evade payment of taxes while unfairly crumbing the market share meant for bona-fide formal transport operators. This was caused by inadequacy knowledge about how to start up legally the intra-city passenger services in an economic way. It was also noted that IRPT operators were ignorant about marketing strategies and benefits of complying with legal operations.

The study recommended polytechnics and other higher education training institutions to design short courses, as the one at Harare polytechnic, that equip start-ups in passenger transport. A wide consultation with relevant transport enforcement agents and associations is a prerequisite of aligning the curriculum to the needs of the sector. It calls for revision of taxes charged to transport operators especially start-ups which were seen as prohibitive. Harare city council must use electronic traffic management scheme for traffic calming. (293 words)

Key Words: Informal, Intra-city transport, SMEs, Formalising, Traffic law

Date to be completed 30 March 2016
229. Information Literacy Evaluation: A Case Study of the Africa University, Mutare, Zimbabwe

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2Harare Polytechnic, School of Information Sciences, Zimbabwe.
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ABSTRACT

Aims: The study evaluated the effectiveness of the information literacy skills course on the utilisation of various information sources at the Africa University. The objective of the study was to identify whether the teaching of information literacy skills at Africa University is having a positive impact on the students’ use of diverse information resources provided by the University Library in support of the University’s teaching, learning and research activities.

Methodology: Survey research design was utilised by researchers. Research site is Africa University and target population consists of users who include students and lecturers. Multi-method approach was made use of by the researchers. A questionnaire was distributed to 150 students in 6 Faculties. 76 questionnaires were returned within the study period.

Results: Respondents stated that information literacy skills and knowledge acquired from this course are essential to pursue their studies in the University and beyond. Findings also indicate that some students do not recognise that the information literacy skills they are learning are transferable and applicable to most areas of their studies.

Conclusion: The study concludes that despite information literacy skills’ training at Africa University utilisation of electronic information sources is still low among undergraduate students.

Key Words: Information literacy; higher education; digital literacy; research literacy; Zimbabwe.

Study completed: 2015

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Joshua Mqabuko Nkomo Polytechnic

230. Enhancing Quality Teaching and Learning Competences: The Role of Research in Fostering Ethics, Ubuntu/Hunhu in Student Teachers. A Case Study of Joshua Mqabuko Nkomo Polytechnic

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ABSTRACT
This is a qualitative study that explores the role of research consultations in fostering Ubuntu/Hunhu, ethics in student teachers by lecturers. It is a case study for Intake 41 General Course and ECD student teachers. The study applied stratified and random systematic random sampling to come out with a sample of 111 students and 35 Teacher Education lecturers. Open ended questionnaires, interviews and focus group discussions were the data collection instruments. Data collected was analysed, presented and interpreted by use of thick narrative descriptions. Major findings were that as student teachers interact with lecturers during research project consultations, they develop Ubuntu/Hunhu, ethics which contribute greatly to quality teaching and learning.

Key Words: Quality, teaching, learning, Ubuntu/Hunhu, competences, research.

Status of study
Completed in May 2014 and paper presented at 2014 UZ July conference.
ABSTRACT
This study seeks to examine student teachers from Joshua Mqabuko Nkomo Polytechnic’s practical experiences in implementing inclusive education in the primary schools they are doing their Teaching Practice (TP). The student teachers follow a 2-5-2 model of training. The model allows them to spend the first two terms at College acquiring knowledge, skills and theories for use in inclusive education during TP. After this, they embark on five terms of teaching practice in schools under the guidance of qualified and experienced mentors. The study was to reflect the student teachers’ implementation of inclusive education in primary schools. The study adopted a qualitative methodology, where an in-depth case study design and qualitative inquiry were used for data generation. The population consisted of 1200 students who were in schools doing their TP. Findings included mixed views of the concept of inclusive education, shortage of resources for full implementation, inadequate training to use varied intervention strategies, low moral support from experienced mentors and school head-teachers. Recommendations were that the government has to create clear policies on inclusive education in schools; schools require support with resources materials that can be used during lesson preparations and presentations and the college may introduce refresher courses for teachers on current trends of inclusion.

Kye words: inclusive education, Student Teachers, Teaching Practice, practical experience primary school.

The research was completed in 5 months.
Towards Promoting Access and Empowering the Girl Child in STEM Education: The Practical Experiences of the Girl Child Students, Studying Electrical Engineering at Joshua Mqabuko Nkomo Polytechnic

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ABSTRACT
This paper examines the practical experiences of the Girl Child students who are studying electrical engineering at Joshua Mqabuko Nkomo Polytechnic, as a move towards empowering them in STEM Education which was a male dominated field. Researches conducted have reflected that the Girl Child was marginalized in virtually all spheres of life and hence the need for them to showcase their potential and competencies in male dominated fields (Mannathoko, 1992; Eangleton, 1995; Marangwi, 2000). In the new millennium, it is argued that, if the Girl Child is given equal educational opportunities as the Boy Child, they can perform even better. A qualitative research methodology with the case study design was used with a purposive sample of twenty five students in their second and third year. The study used a mixed questionnaire and focus group discussion to collect data, which were presented in the form of tables, pie charts and graphs. Thick and rich descriptions were further employed to complement the quantitative presentation. Findings were that students had different practical experiences in the way they pursued their career in electrical engineering. Some indicated that some male counterparts in the same field looked down upon them and doubted their competences, while others highlighted that they excelled even better than their male counterparts despite the society stereotype perceptions. The recommendations were that the Polytechnic should host annual Careers Day open to all secondary school pupils which aim at showcasing some of the courses that can be done by the Girl Child to avoid negative stereotypes.

Key words: Girl Child, STEM Education, Practical experiences, Electrical Engineering.

This research was completed in 6 months.

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ABSTRACT
This paper examines the practical experiences of the Girl Child students who are studying electrical engineering at Joshua Mqabuko Nkomo Polytechnic, as a move towards empowering them in Stem Education which was a male dominated field. Researches conducted have reflected that the Girl Child was marginalized in virtually all spheres of life and hence the need for them to showcase their potential and competencies in male dominated fields (Mannathoko, 1992; Eangleton, 1995; Marangwi, 2000). In the new millennium, it is argued that, if the Girl Child is given equal educational opportunities as the Boy Child, they can perform even better. A qualitative research methodology with the case study design was used with a purposive sample of twenty five students in their second and third year. The study used a mixed questionnaire and focus group discussion to collect data, which were presented in the form of tables, pie charts and graphs. Thick and rich descriptions were further employed to complement the quantitative presentation. Findings were that students had different practical experiences in the way they pursued their career in electrical engineering. Some indicated that some male counterparts in the same field looked down upon them and doubted their competences, while others highlighted that they excelled even better than their male counterparts despite the society stereotype perceptions. The recommendations were that the Polytechnic should host annual Careers Day open to all secondary school pupils which aim at showcasing some of the courses that can be done by the Girl Child to avoid negative stereotypes.

Key words: Girl Child, Stem Education, Practical experiences, Electrical Engineering.
ABSTRACT
In Teacher Education, it is mandatory that all lecturers and student teachers be exposed to Information and Communication Technologies (ICTs) as a way of promoting and sustaining education in Zimbabwe. As catalysts they are used to create, disseminate, store, manage, communicate, and transfer information making it accessible to students at their convenience and place. All these are in line with the Zimbabwean National Policy on Information and Communication Technology that was introduced in 2005 which states that (ICTs) should be introduced from Early Child Development (ECD) to Colleges and Universities. (Nziramasanga Commission of Inquiry 2005). The move is a great shift towards encouraging learners to become actively involved in learning as opposed to being receivers of information. (ZIM ASSET 2013; UNESCO 2000:54; Barrent and Johnson 2003). The study provides lecturers and student teachers’ practical experience in using (ICTs) in their environmental science lectures, course work assignments and research. The study adopted a qualitative methodology, where a case study design was used for data generation. The population consisted of 10 lecturers, 1 Head of Departments and 100 student teachers on Teaching Practice. Lecturers and student teachers’ practical experiences basing on accessibility of (ICTs) and hands on competencies is provided on the findings of the study. Some recommendations basing on findings will be provided.

Key Words: Information and Communication Technologies, catalysts, environmental science, students’ practical experiences,

The research was completed in 5 months.
ABSTRACT
The Department of Teacher Education (DTE) at the University of Zimbabwe requires that diploma students at teachers’ colleges embark on action research. The practice is to empower student teachers with skills and knowledge to comprehend and deal with local workplace challenges leading to the development of theories. It was noted at JOSHUA MQABUKO NKOMO (JMN) Polytechnic that there was little positive contribution made by action research done by student teachers in schools, towards enhancing quality education. A study was used to ascertain the effectiveness of the JMN Polytechnic model of action research done by student teachers in schools. A qualitative approach paradigm was used in the inquiry process involving Primary Schools in the Gwanda urban cluster where students from each intake are deployed. The Schools had a total of 84 teachers, 6 heads and 20 student teachers. A randomly selected sample of 10 students and their mentors as well as the heads from all the schools in the cluster was used to generate and collect data. Some open ended questionnaires, interviews and focus group discussions were used. Data were collected and interpreted using some emerging themes. The findings were that the school mentors were not supervising the student teachers doing the research. The findings from the different research projects were not shared with stakeholders like mentors at the schools. The findings were a preserve for the college supervisors. Seemingly the research findings were not used to inform pedagogic practices at school level. It was recommended that the school mentors supervise student teachers in their research. The research findings were to be shared with the mentors, schools and the college so as to be used in enhancing quality education.

Key words: student teachers, mentors, pedagogic practices and action research

Date when the study was completed: 30 April 2014
ABSTRACT

The study aimed to establish reasons for the disparity in the assessment of student teachers between college lecturers and school mentors. A qualitative research design was used to conduct this study. Data was collected from six purposively selected schools from which 12 mentors, 12 mentees and 6 heads were sampled. Interviews, questionnaires and focus group discussions were used to generate and collect data. Data analysis and interpretation was done from emerging themes. Findings were that mentors lacked guiding criteria from college hence the variance in assessment. Recommendations were that mentors be staff developed through workshops.

Key Words: mentorship, student teachers, assessment

Date when the study was completed: 7 July 2014
The Effect of Assessment on Pedagogic Practices in Implementing the Environmental Science Curriculum at Tertiary Level: A Case Study of Joshua Mqabuko Nkomo Polytechnic

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ABSTRACT
The Environmental Science main study syllabus at Joshua Mqabuko Nkomo Polytechnic focuses on equipping students with scientific skills so as to enable them to be investigative, innovative and contribute meaningfully to Science and Technology as well as the environment. The hands on approach method of instruction are emphasized. A descriptive survey was carried out on 18 purposively selected final year Environmental Science students with a view of establishing the extent to which assessment as a monitoring and evaluation tool of curriculum implementation had impacted on the students’ performance. The group had a mediocre performance with only one distinction recorded notwithstanding the fact that the students chose to do in-depth study of the subject willingly. To generate data some interviews, questionnaires and focus group discussions were used. Findings were that assessment at College level was not used to influence curriculum implementation and innovations required to respond to individual learner and local environmental needs. Assessment as a monitoring and evaluation tool was not used to stimulate research so as to improve pedagogic practices at the College. Some recommendations were that the hands on approach was supposed to be emphasized so that the Science students could develop the requisite scientific skills and be innovative enough to respond to local, national and global environmental challenges. It was further recommended that the Environmental Science lecturers should update their knowledge through staff development programmes and exchange visits with other colleges so as to share their best practices in the ever changing world of science.

Key words: pedagogic practices, environmental science, curriculum.

Date when the study was completed: 20 July 2014
The Extent to Which the Grade Seven Environmental Science Syllabus Is Implemented In Four Primary Schools in the Matshetsheni Communal Area and Four Other Primary Schools in Gwanda Urban

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ABSTRACT

At grade seven level Environmental Science is examined together with other content subjects like Social Studies, Religious and Moral Education as well as Home Economics. This limits the teachers focus on the requisite skills to be learnt in the subject. In view of this assertion a survey was conducted to evaluate the extent to which the grade seven Environmental Science Syllabus was implemented using a systematically selected sample comprising four heads, four grade seven teachers and forty grade seven pupils from four schools in the Matshetsheni communal area of Gwanda. The other part of the sample comprising four heads, four grade seven teachers and forty grade seven pupils came from Gwanda urban. Semi-structured interviews and focus group discussions were used to generate and collect qualitative data. The main findings were that teachers were using inappropriate methodological approaches and they lacked resources to effectively teach environmental science. Recommendations were that there was need to have specialist environmental science teachers and well equipped laboratories in primary schools. Environmental Science teachers need to have a practical bias so that learners could be environmentally friendly. Research is needed to seek ways of improving the teaching and learning of environmental Science at primary School level

Key words: environmental science, methodological approaches, research, laboratories

Date when the study was completed: 10 June 2015
ABSTRACT
The environmental science main syllabus at Joshua Mqabuko Nkomo Polytechnic focuses on equipping students with scientific skills so as to enable them to be investigative, innovative and contribute meaningfully to science and technology as well as the environment. The hands on approach to instruction are emphasized. A case study using the descriptive survey methods was carried out on 18 purposively selected final year environmental science students from a group of 130. The students in the sample had a mediocre performance not withstanding the fact that they had willingly chosen the subject. The focus of the study was to try and establish the extent to which assessment as a monitoring and evaluation tool of curriculum implementation had impacted on the student’s performance. To generate data some interviews, questionnaires and focus group discussions were used. Findings were that assessment at college level was not used to influence curriculum implementation and innovations required to respond to individual and environmental needs. Assessment as a monitoring and evaluation tool was not used to stimulate research so as to improve pedagogic practices at college. Recommendations were that the hands the hands on approach was supposed to be emphasized so that the science students could develop the requisite scientific skills and be innovative enough to respond to local, national and global environmental challenges. The study further recommended that the environmental science lecturers should update their knowledge through staff development programs and exchange visits with other colleges so as to share their best practices in the ever-changing world of science.

Date when the study was completed: 30 April 2014
ABSTRACT

Current educational direction is clear on the thrust to ensure children with disabilities are accommodated in the education system, as these contribute significantly to the overall pass rate in schools and the nature of the future generation. They are also expected, as members of the larger society, to play a substantive role in the socio-economic development of the nation. Of these children, those with learning disabilities are not an exception. It has been noted with great concern that despite the educational provisions and services availed in the schools this particular group of students remains performing below the expected standards. This study, therefore, evaluated the implementation of the availed educational provisions and services meant for children with learning disabilities. A case study approach of the qualitative methodology was used in this study. A purposive sampling technique was employed to select 28 (18 boys and 10 girls) pupils with specific learning disabilities, the Provincial Schools Psychological Services/Special Needs Education personnel, 14 special class teachers, 14 regular class teachers and 14 Heads of schools judged to be suitable for the study. The results of the study revealed that there are limited numbers of teachers who are skilled to provide the relevant programmes. It also emerged that the implementation of relevant programmes, to a certain extent, depends on the attitudes of administrators and other relevant stakeholders. The study further recommended that a collaborative action be adopted by training institutions and relevant Ministries to equip pre-service and in-service teachers with requisite skills to teach students with various learning disabilities.

Key words: learning disabilities, educational programmes, implementation

Date when the study was completed: January 2015
Leadership Competency and Work Environment: Enhancing Inclusive Learning for Educational Development in Tertiary Education in Zimbabwe

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ABSTRACT
The purpose of the study was to examine the impact of leadership competences and work environment on the implementation of inclusive learning and educational development at Joshua Mqabuko Nkomo Polytechnic. The study also investigated the top management’s leadership behaviour in an institution that educates both teacher and technical students. More specifically, the study was to determine the extent to which Joshua Mqabuko Nkomo Polytechnic enhances inclusive learning for educational development as from 2009 to 2013. The study further assessed the factors hindering the implementation of inclusive learning and suggested possible ways of fostering inclusive learning for educational growth in Zimbabwe. A case study applying the mixed methods approach was used to conduct the study. A purposive sample of 80 staff members was drawn from a population of 240 staff members drawn from administration, lecturers, non lecturing staff and 100 students sampled from both faculties were examined. Data collection instruments were document analysis, questionnaires, interviews and focus group discussions. The study established that there was increased education development and staff empowerment through human capital development programmes. Education is now imparted through local minority languages regardless of gender and age. Findings of the study further revealed that there are constraints to the implementation of inclusive education due to lack of infrastructure development, high fees charged by the ministry, limited motivation strategies and effective leadership skills, poor working conditions and limited training resources. The study recommended for improved working environment and leadership styles that enhances inclusive learning for effective educational development in the technical education system in Zimbabwe.

Key Words: Leadership competence, work environment, educational development, inclusive learning, Tertiary education, competency behaviour

Date when the study was completed: May 2015
ABSTRACT
The purpose of the study was to assess the contribution made by the Technical and Vocational Training programmes towards sustainable community development in Matabeleland South Province. The study also determines the extent to which the youth are technical empowered for self-sustenance and sustainable livelihood. The study further examines challenges and suggests possible solutions on factors hindering youth from attaining entrepreneurial skills and embarking on local community development programmes. The study adopted a qualitative methodology, where an in-depth case study design and qualitative inquiry were used for data generation. The population consisted of 250 participants drawn from the five Technical and Vocational education and Training institutions in the province. The findings revealed mixed views on the concept of youth entrepreneurial educational, shortage of equipment, training consumable and exorbitant tuition fees hinders the youth with 0 ‘O level and 4 ‘O levels from acquiring the entrepreneurial skills for sustainable community development in the region. Vocational and Technical education is making a major contribution to community development by providing learning and entrepreneurial skills to those youth who have been marginalized from mainstream education. Recommendations were that the government should create clear policies on youth entrepreneurship skills development and to provide adequate funding towards the training of the youth in the region.

Key Words: Educational empowerment; Sustainability; Entrepreneurial skills; community development; Unemployment eradication: Technical and Vocational Training.
ABSTRACT

The purpose of the study was to explore strategies to strengthen local food products and the food service sector linkages to meet the tourism demand in Victoria Falls. The study examined the extent to which the local community benefits from such practices. The study further assessed the challenges and suggested possible solution on factors affecting such linkages. The study adopted the qualitative methodology, where in depth case study design and qualitative inquiry were used for data generation. A questionnaire and interview survey of hoteliers, local farmers and tourists was carried to elicit information. Findings showed that food production and food service linkages were at its infancy stage. The industries preferred imports goods than local produce. The local food producers were not able to meet the Tourism demand. The study recommends that there should be refresher courses for the local community on tourism products quality trend. There should be clear policies on local food products and tourism demand linkages to improve the livelihoods of the local community in Victoria Falls.

Key words: Agriculture -Tourism linkages ; Sustainability; Food Production -Food Service linkages; Social Equity; Community Development; Competitiveness
Mainstreaming Indigenous Knowledge Systems (IKS) Through Re-Introducing Sesotho in the Primary School Curriculum

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ABSTRACT
Knowledge is situated. The school curriculum presents knowledge in a given context and this has a bearing on the socio-economic development of the country. A case study was carried out to investigate the effects of re-introducing SeSotho in some schools in Gwanda South district which is predominantly a SeSotho speaking area. A qualitative research design was used for the study. Purposive sampling was used to come up with 10 primary schools, 50 teachers, 10 heads of schools, 1 education officer, 1 provincial education director, 1 chief, 1 councillor and 10 opinion leaders. The sample was drawn from the schools offering Sesotho. Structured interviews and open ended questionnaires were used to generate data. The findings were that the re-introduction of SeSotho in the school curriculum enhanced access to education and participation in socio-economic activities for the Basotho. The study recommended that resources be availed for effective mainstreaming of SeSotho in schools and universities to promote social cohesion and empowerment for socio-economic development.

Key words: indigenous knowledge systems, curriculum, mainstreaming, human rights, constitution
Toward Promoting Inclusion of Indigenous Languages in Teacher’s Colleges: Challenges and Opportunities Encountered by Lecturers and Students Studying Tshivenda at Joshua Mqabuko Nkomo Polytechnic

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ABSTRACT
Zimbabwe has 14 indigenous languages. The other 14 indigenous languages were not offered at primary and secondary schools. These 14 languages were marginalised from the pre-colonial to the post-independence era. After an outcry from the language speakers, the government decided to officialise the 16 languages. The constitution of Zimbabwe also recognised the 16 languages meaning that the other 14 formally marginalised languages were included in the constitution. In 2012, Joshua Mqabuko Nkomo Polytechnic was tasked by the Ministry to train teachers in the local languages that is Tshivenda, TshiKalanga and Sesotho. The introduction of these languages came with some teething problems. Some of the students who were enrolled were just language speakers but could not read or write the language. The students don’t know the correct Tshivenda orthography. The research will be looking at the challenges faced by students doing Tshivenda since the introduction in 2012 and opportunities after studying the language. The problems range from employment of qualified personnel to that of resources and material. A case study research design will be used in this research since it enables the researcher to obtain rich information on the problem. The population will be all students studying Tshivenda. Data will be generated through questionnaires, interviews and focus group discussions.

Key Words: Indigenous, Opportunity, Tshivenda

Date when the study was completed: May 2015
Exploring Gender Based Violence against Men and it’s Implications On Socio – Economic Transformation. A Case Study of Gwanda Town

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ABSTRACT
Society has placed greater concern on gender based violence against women than against men. This is a qualitative case study which explored gender violence against men in Gwanda town. Fifty participants were purposively and conveniently sampled for interviews and focus group discussions. Data analysis and presentation was in thick narrative descriptions. Findings were that men were perpetrators of violence and victims who are affected by gender stereotypes. The study noted that although men are also victims of abuse by women their predicament is not readily accepted by society. The study recommends a paradigm shift where violence should not be tolerated against both sexes.

Key words: Gender based violence, gender stereotypes, victims, perpetrators, men, and women.

Status of the study: On-going research. To be completed in May 2016.
Student Teachers’ Practical Experiences in Implementing Inclusive Education to Students with Diverse Needs: A Case of Joshua Mqabuko Nkomo Polytechnic

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ABSTRACT
This study seeks to examines student teachers from Joshua Mqabuko Nkomo Polytechnic’s practical experiences in implementing inclusive education in the primary schools they are doing their Teaching Practice (TP). The student teachers follow a 2-5-2 model of training. The model allows them to spend the first two terms at College acquiring knowledge, skills and theories for use in inclusive education during TP. After this, they embark on five terms of teaching practice in schools under the guidance of qualified and experienced mentors. The study was to reflect the student teachers’ implementation of inclusive education in primary schools. The study adopted a qualitative methodology, where an in depth case study design and qualitative inquiry were used for data generation. The population consisted of 1200 students who were in schools doing their TP. Findings included mixed views of the concept of inclusive education, shortage of resources for full implementation, inadequate training to use varied intervention strategies, low moral support from experienced mentors and school head-teachers. Recommendations were that the government has to create clear policies on inclusive education in schools; schools require support with resources materials that can be used during lesson preparations and presentations and the college may introduce refresher courses for teachers on current trends of inclusion.

Key Words: inclusive education, Student Teachers, Teaching Practice, practical experience primary school.

This research was completed in 6 months.
ABSTRACT
The study examines student teachers practical experiences in assisting students with dyslexia (reading problems) in primary schools; they are doing their Teaching practice for five terms. The study aims at adopting new strategies that would empower student teachers as competent human resource during their training period, which meet and align Zimbabwean education with the demands of the global village. The study adopted a qualitative methodology, where a case study design and qualitative inquiry were used for data generation. The population consisted of one hundred and five student teachers from the seven districts. Findings were that, the student teachers had different practical experiences based on schools set up in terms of availability of resources, assistance from mentors during identification of pupils with dyslexia, focusing on indicators when it came to implementation of inclusive education in Zimbabwe. The recommendations were that

Key Words: dyslexia, practical experiences, inclusive education

This research was completed in 6 months.
ABSTRACT
In Teacher Education, it is mandatory that all lecturers and student teachers be exposed to Information and Communication Technologies (ICTs) as a way of promoting and sustaining education in Zimbabwe. As catalysts they are used to create, disseminate, store, manage, communicate, and transfer information making it accessible to students at their convenience and place. All these are in line with the Zimbabwean National Policy on Information and Communication Technology that was introduced in 2005 which states that (ICTs) should be introduced from Early Child Development (ECD) to Colleges and Universities. (Nziramasanga Commission of Inquiry 2005). The move is a great shift towards encouraging learners to become actively involved in learning as opposed to being receivers of information.(ZIM ASSET 2013; UNESCO 2000:54; Barrent and Johnson 2003). The study provides lecturers and student teachers’ practical experience in using (ICTs) in their lectures, course work assignments and research. The study adopted a qualitative methodology, where a case study design was used for data generation. The population consisted of 60 lecturers, 15 Heads of Departments and 350 students out of 965 student teachers on Teaching Practice. Lecturers and student teachers’ practical experiences basing on accessibility of (ICTs) and hands on competencies is provided on the findings of the study. Some recommendations basing on findings will be provided.

Key Words: Information and Communication Technologies, catalysts, students’ practical experiences,

This research was completed in 6 months.
ABSTRACT
Mining in general has a profound effect on global climate change. Mining operations around the world continue to contribute to water and air pollution, greenhouse effect and the rise in sea levels as predicted by several researchers on climate change. Gold mining in particular, disturbs vast stores of carbon held in soil and vegetation, releasing it into the atmosphere. It also indirectly contribute to alterations in weather patterns caused by warming of the earth and related atmospheric phenomena. Zimbabwe as part of the global village has taken strides to mitigate the long term impacts of mining on climate change by adopting the implementation of the Environmental Impact Assessment on all mining operations. The purpose of this study was to find out the extent to which registered small scale gold miners around Gwanda town are doing Environmental Impact Assessments in their mining claims. The study employed a qualitative research design. A case study was used to study 20 registered small-scale gold mines. Purposive sampling was used to select the research participants. Interviews and focus group discussions were used to solicit information from the research participants. Findings of the study revealed that three quarters of the miners do EIA for the sake of fulfilling requirements but do not actually comprehend its purpose. The study also revealed that EIA is done by consultants who charge exorbitant fees and in most cases do not communicate the results of the process to the proponents (miners). Findings further revealed that although registered, most small scale gold miners lease pieces of land in their claims to several illegal gold miners who do not take into account the results of the EIA report in their operations. The study recommends that capacity building must be done by the Ministry of Mines in partnership with the Environmental Management Agency (EMA) to educate and empower small-scale miners about the nature and importance of EIA. The study also recommends that the government must standardise the consultancy fees so as to make sure EIA is accessible and affordable to all small-scale miners in Zimbabwe.

Key Words: Environmental Impact Assessment, Mining, Climate change.

Date when the study will be completed: December 2015

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ABSTRACT
The purpose of this study was to find out whether women were being empowered economically as men, through entrepreneurial activities. The research employed a qualitative approach. A case study was used to study women entrepreneurs within Gwanda District. Questionnaires and interviews were used to solicit information from 20 women selected purposively. Findings revealed that most women have been economically empowered though the majority are still at subsistence level. Conclusions were that entrepreneurship results in improved standards of living and economic freedom to most women who were previously on the peripheries of economic growth and development. The research recommends that institutional frameworks be established to meaningfully empower more women economically.

Kye words: Entrepreneurship, Women, Economic transformation.
ABSTRACT
The purpose of the study is to establish whether Whatsapp communication between lecturers and student teachers is effective enough to enhance interaction on research issues and identify possible challenges experienced during its usage. Student teachers at the college are expected to spend five terms doing Teaching Practice, and during that time are expected to write assignments and research projects, which requires them to constantly visit college for consultation. It was observed that instead of travelling to college often, some lecturers and some students resort to the use of Whatsapp as a mode of communication. The study intends to find out how effective Whatsapp is against the background that not all students and lecturers have cell phones with that facility. Joshua Mqabuko Nkomo Polytechnic, like any other institution during this century, is moving from a paper-based correspondence to a more digitally advanced distance learning institution. The research employed the quantitative research design, with the main focus on student teachers on Teaching Practice. Purposive sampling was used focusing on forty student teachers doing Teaching Practice in Mberengwa and Zvishavane Districts and forty lecturers who are research supervisors. The study revealed that most student teachers on Teaching Practice prefer using Whatsapp as it save them on transport costs. Findings further indicated that student teachers’ movement to and from college is minimised hence giving them more time to do their assignments and preparing daily lesson plans. It was also revealed that not all lecturers and student teachers had cell phones with Whatsapp facility. The study provided fundamental information necessary to further determine the effectiveness of using Whatsapp in communicating with student teachers during the terms when they are on distance learning. Recommendations were that during orientation time students in their first year should be given parameters they should follow when using Whatsapp to communicate with research supervisors. Specific times should be spelt out when to use the application as well as the nature of content to be sent.

Key Words: Communication, Teaching Practice, Distance Learning.

Date when the study was completed: May 2015
Design, Manufacture and Installation of a Universal Hydraulic Drifters and Cylinders Test Bench at Mimosa

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ABSTRACT
MIMOSA is a platinum mining company located in Zvishavane. Drifters, in this are HLX5 drifters, Hydrasta drifters and Hydraulic Cylinders are essential tools used in this organisation and need to be operating efficiently at all times. On average the Mobile Equipment Department has been outsourcing the repairs and testing of 15 drifters per month. The average cost per drifter being $20 000.00, resulting in the department spending $300,000.00 per month which is 50% of the Departmental budget. This paper seeks to design, manufacture and install a universal hydraulic drifter and cylinders test bench using locally available material resources. The designed test bench will totally eliminate outsourcing of drifter repairs and rotation and percussion testing. The machine designed consists of a Hydraulic Tank which acts as storage and cooling tank, an electric motor, and valves among other elements.

Key Words: Drifter, Hydraulic Cylinders pressure, rotation, percussion, load resistance, system cylinder area and hydraulic circuit.
ABSTRACT
Macdonald Bricks, is a Bulawayo based brick manufacturing company with two factories, Montgomery acquired in 1988 and Wills grove added in 1992. In brick manufacturing air flow and temperatures attained are of paramount importance as these determine the quality of the bricks. It takes 23 hours to produce a brick of which 8 hours is for pre-heating (up to 700°C) and 15 hours is for firing (up to 900°C). It requires six (6) tonnes of fine coal to complete a kiln cycle at a cost of $30 per tonne. Currently at Macdonald Bricks pre-heating is completed with temperatures of around 400°C and bricks are produced at 900°C at the air feeding point and 400°C at the rear end. This an even distribution of temperature, lead to the production of a mixture of high and low grade bricks, hence, negatively affect the cost of production. As a result two (2) tonnes of coal out of 6 required per cycle remain unburned or unused and is thrown away as it will be mixed with ashes. The authors intent to design, manufacture and install a burner and blower system, with improved air circulation, to achieve an even distribution of temperature along the kiln using locally available resources.

Key Words: Burner, Temperature distribution, air circulation and cost of production.
ABSTRACT
Zimbabwe National Water Authority operates 900mm dam discharge valves at Zhove dam along Mzingwane River in the Beitbridge area. Water release downstream is through the control of two mechanical valves which are in series. Regulated water release downstream enables supply of citrus plantations in the area with irrigation water. The two valves are not designed to control flow but to operate in complete opening or complete shut positions. Currently ZINWA is using these valves to control flow. This inappropriate mechanical operation continually has an adverse effect on the operation of the system as it strains the open and shut gear mechanisms on the valves as well as destructive vibrations (due to lack of energy dissipation) on the outlet infrastructure. This prompted the World Bank to recommended that (i) a system be designed to remove the strain on the butterfly valve (ii) a flow control mechanism be designed and installed and avoid using the butterfly valve for flow control (iii) a mechanism/system be designed for energy dissipation to minimize vibrations that cause damage to the dam wall and the intake tower piping. The following is studied during the research: The efficient mechanical designs to be installed to achieve flow control, designs for energy dissipation in a safe way and without damaging the dam wall and designs for actuating the flow controller.

Key Words: Mechanical valves, energy dissipation
256. Design of a Semi-Mechanised Sugarcane Cutter

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ABSTRACT

Most sugarcane harvesting in Zimbabwe is done manually as farmers cannot afford full featured combined harvesters. The challenges of manual harvesting are the high labour demand and loss of quality (loss of sugar content) of sugar cane due to the long time taken to have the harvested cane transported to mills. This design intended to reduce the strenuous cutting process and labour will only be required to pile cut cane into piles for loading into trucks. The research project was aimed at coming up with a mechanical design that is tractor powered and this implied that the critical design was to match the mechanical drive system of the tractor (the three point linkage and the power take off shaft) and size the components appropriately to match tractor speed. The final mechanical drive that was selected includes a chain drive power transmission which drives bevel gears on shaft connected to the cutting disc (600mm diameter). The theoretical design capacity is 6000 kg/h. The machine has successfully coupled and showed smooth running. Future tests to be done include its performance in the actual sugarcane field while cutting and observations include stability and rigidity, quality of cuts, lowest level of cut and the tractor wheel positions with reference to sugarcane lines. The machine has also potential application by farmers who harvest green maize for animal feeding.

Key Words: semi-mechanised, chain drive, bevel gears
ABSTRACT
One of the nightmares that managers at the workplace face today is the social, political, religious, economic and intellectual diversity among the workforce. The workforce of Zimbabwe consists of people with average ages of between 17 and 75 years. Among these ages, this paper explores 4 generations. The first one is the 2nd Chimurenga generation consisting of those born between 1940 and 1959 (56-75 years), the second generation consists of those born between 1960 and 1979 (36-55 years), the third generation consists of those born between 1980 and 1990 (25-35 years) and the last generation are those born after 1991 to present. This paper can argue that each generation above has significant shared events and conditions to which they were exposed as they grew. Their common experiences shape their attitude towards work and the society in general. From the statistics collected, first generation workforce is hard working, respect rules, dedicated, patriotic, loyal and live on hoping. They value experience as more important than any qualification and are generally egocentric. The second generation are fierce competitors for personal growth and believe education is more important than experience. They have a wait and see attitude with a passion to continue learning, albeit, accumulating more papers. They have resentment towards the older generation as well as the younger generation. The third generation were born after independence, have no patience, want everything to be fast tracked and always ask why before performing duties. They are more worried about safety issues at work and will not hesitate to go on strike. They migrate from company to company and always compare their salaries with their counterparts in other countries. The last generation grew up in the era of hoarding, speculation, uncertainty, inflation and deflation and therefore do not trust everything Zimbabwean. They resent own culture, are more westernised and are not confident of doing delegated tasks. They are afraid of learning through making mistakes. They rely more on technology especially when it comes to communication and merely believe in working to live. This paper therefore first identifies the value systems of each generation and how these values affect motivation and behaviour at the workplace. Thus a model is to be developed from the research to bridge and deal with these significant differences so that effective workplace strategies can be affected in order to be more productive and competitive.
ABSTRACTS
Apiculture is the practice of keeping bees for domestic and commercial purposes and the manufacture of related hive products namely Honey, beeswax and propolis. Ecology is a branch of biology that deals with relations of organisms to one another and their physical environment. This research about understands the relationship between bee colony populations’ multiplication programmes and how they are influenced by changing land use patterns brought about by the introduction of human settlements, agricultural and agro-forestry activities. Bees play an important role in the ecosystems, sustaining forest diversity and providing a livelihood for those communities that rely on forest resources for their livelihood. Through the use of a simple localised Geographical information systems and local nectar flow index that will be developed, the research will graphically present in two and three dimension, the temporal and spatial population densities and dynamics of honeybee colonies in response to changing settlement, forest nectar resources and daily average weather conditions. An apiary will be set up at Kushinga Phikelela polytechnic through which bee colony multiplication programmes will be conducted to determine the effectiveness of locally based bee colony, multiplication programmes. The research, in the long term will provide an opportunity for training and capacity building for local farming communities and for product development and value addition in the beekeeping value chain. This creates a basis for setting up community based beekeeping initiatives that improve and enhance community livelihood options that rely on locally available water, agricultural and forest resources.

Key Words: Nectar flow, Beekeeping, Bee colony, multiplication

Date when study is expected to be finished: September 2018
Design of PVC Extruder for Recovery and Management of Plastic By-Products and Waste

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ABSTRACT
Zimbabwe faces an ever increasing challenge of waste management. The community has drifted from use of recyclable bottles that were exchanged for deposits. The beverage market continues to introduce new products packaged in plastic bottles, wrappers and containers. Children’s toys and many household gadgets are slowly drifting towards being made up of plastics and these plastics have become a nuisance and an eyesore in the streets, sewer reticulation systems that have been blocked and along the highways where these plastic are tossed through moving vehicle windows. There is need therefore, to find a sustainable way of managing such ever increasing amounts of plastic trash and one such method is to derive economic value from such waste. The purpose of this research is thus, to design and manufacture a plastic extrusion machine that is capable of making use of all types of plastics, create alternative plastic products of economic value for the farming communities in Zimbabwe while reducing reliance on natural resources such as use of timber and metal. The method involves design of plastic waste volume reduction techniques, development of an in built heating system for smelting plastic with minimal noxious gas emissions to the environment and a pressurised system of moulding molten plastic into sustainable household and on farm use by products. The products will be tested for durability, usability and general acceptance by potential users. The expected output of this programme is thus of sustainable use of plastic waste through an efficient low energy plastic recycling technology that will expand the value and usability of plastic waste. The machine will also create employment opportunities for the enterprising youths and an opportunity for developing small to medium enterprises within waste management business and industry.

Key Words: Plastic extruder, Plastic recycling

Date when study is expected to be finished: September 2016
ABSTRACT
Mining keeps getting more expensive as evidenced in the diamond mining sector where the mineral is said to be now deeper and expensive to extract using currently available technology. At the same time, electronic waste keeps pilling in our storerooms especially in the public sector/government institutions due to stringent procedures that do not allow easy disposal. The electronic-business has a global net worth of nearly USD21 billion and that is not being exploited and Zimbabwe is a country in need of sustainable, cheap and quick returns through formal Small to Medium Enterprises (SMEs) especially for the many unemployed youths in Zimbabwe. The goal of this research is therefore to assess the potential of electronic-waste (e-waste) recovery programmes in Zimbabwe as a prospective formal Small to Medium Enterprise activity. This is done specifically through characterisation electronic-waste in Zimbabwe’s domestic formal and non-formal communities, conducting a cost benefit analysis of full commercialisation of electronic-waste mineral recovery programmes in Zimbabwe through SMEs. The research finally evaluates environmental impacts and mitigation alternatives of an official e-waste mineral recovery programme while exploring the legal framework and basis for conducting e-waste mineral recovery programme. The research makes use of questionnaires and interviews to determine local capacity of SMEs to sustainably undertake Rare Earth Elements (REE) recovery programme. It also involve laboratory works to determine the most efficient recovery methods that could be applied locally to facilitate safe and environmentally sound methods of REE recovery that are applicable to the local community. The research is thus expected to come up with a framework for engaging in e-waste recycling and value addition through REE recovery. An inventory of best practices for conducting e-waste REE recovery programme through SMEs and finally, an analysis of current and potential legal framework for E-waste essential elements recovery will be produced.

Key Words: Rare earth elements, E-waste, Recycling, Cyanide Stripping, Urban mining

Date when study is expected to be finished: September 2016
Lupane State University

Faculty of Humanities and Social Sciences (Published Papers Abstracts)

261. Emerging Issues on the Sustainability of the Community Based Rural Water Resources Management Approach in Zimbabwe: A Case Study of Gwanda District

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ABSTRACT
Although there is considerable on-going debate about the suitability and sustainability of community based water resources management (CBWRM) in Africa as a water provision strategy, evidence shows that this approach has gone a long way in promoting access to clean water amongst rural African communities. CBWRM provides an alternative approach to water provision for rural communities. This paper examines how the strategy has been operationalised in Gwanda District in Zimbabwe. The paper examines the experiences of rural communities in using CBWRM. Data was collected using focus group discussions, key informant in-depth interviews and a survey of 685 households in Gwanda district across five wards. The findings of this study are that 67% of the surveyed rural communities in Gwanda depended on community managed water resources mostly in the form of boreholes and protected wells. High rates of non-functional sources were reported at 60-70% in most wards. Several system weaknesses were noted in the current CBWRM set-up including a depletion of committee memberships, inadequate community resources, limited agency and government support. This paper makes several recommendations on strengthening the capacity of CBWRM in Zimbabwe and Africa.

Key Words: Community management, Water, Rural communities, Capacity, Sustainability
ABSTRACT
This paper discusses the trends and patterns regarding the participation of women and men in parliamentary politics in Zimbabwe from the first democratic elections in 1980 to the 2008 elections in the context of global and regional trends. The main objective of this paper is to review both quantitative and qualitative data concerning the progress made in the direction of promoting women’s participation in politics against the background of Millennium Development Goals targets and other international targets to which Zimbabwe is a signatory. One of the targets of the 3rd millennium development goal is to increase the ‘proportion of seats held by women in national parliaments’. The period of focus is between 1980 and 2013. The paper notes that the current levels of women’s representation in parliament remain below the world average of 19%. The various causes of this are highlighted and discussed leading to recommendations in tackling the issue.

Key Words: Gender, equality, politics, Zimbabwe, democracy, parliament, participation.
ABSTRACT
This paper is an experiential review of two major challenges faced by the author in carrying out fieldwork in development evaluation for a women’s project. The paper reviews two particular challenges that are common but often neglected in fieldwork of this nature. The first challenge is being male and studying projects meant for female beneficiaries in an African culture. The second challenge comes from eliciting information from donor dependent communities who understand the value of information given to donors as far as their livelihoods are concerned. Despite the importance of the latter issue, this area of study has a dearth of information. The article is based on experience from development projects evaluation in Zimbabwe, but more specifically from a gender project evaluation exercise in Matabeleland North Province in Zimbabwe. Recommendations are made on how to safeguard the reliability of collected field data in the face of these challenges.

Key Words: Evaluation, fieldwork, gender, empowerment, curb stoning, donors, politics
An Analysis of the Status of the Secondary Noun Prefixes in Ndebele

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ABSTRACT

The article probes into the nature of secondary noun class prefixes in the morphology of some Nguni languages and Ndebele in particular. The secondary prefixes are known as commentary prefixes mainly because they carry overtones of sarcasm, criticism and caricature among other elements, through loading an implied meaning onto a noun construction. The overtones in reference are a reflection of how people view each other and how they evaluate other objects in their immediate environment. In some African languages like Shona, these overtones are embedded in the noun class prefixes, that is, the basic prefix. It is alleged that Ndebele, along with other Nguni languages, do not have secondary prefixes. It is argued that the semantic overtones are entrenched in the augmentative and diminutive suffixes. Contrary to what we find in Nguni literature, however, Ndebele speakers also use evaluative (commentary) prefixes to express semantic values of contempt and endearment. Consequently, this paper confirms the presence of commentary secondary prefixes in Ndebele on the one hand and discusses their categorical status in the noun classification system on the other.

Key Words: Ndebele prefixes, language, affixes, prefixes
ABSTRACT
The reality of climate change is now a well-accepted reality and there is emerging evidence that climate change poses a massive threat for development especially in poor countries. An understanding of the emerging trends of climate change and its effects in local ecologies is an important starting point in addressing the negative effects of climate change. This study sought to understand the impact of climate change on the livelihoods of local communities, focusing on Matobo District in Zimbabwe. The objective of the study was to understand how communities have been affected by climate change and how they are adapting to it as well as their perceptions about the gravity of the climate change phenomenon. The findings of the study were that the effects of climate change on livelihoods in the study area are alarming. Climate change has altered the physical geography of the area leading to a disappearance of flora and fauna and other natural habitat that constituted the livelihoods of the local people. Declining precipitation and rising temperatures are making farming increasingly more difficult, and thus aggravating food insecurity in the area. Urgently climate change programming steps must be taken to prevent a livelihoods catastrophe in semi-arid regions in sub-Saharan Africa.

Key Words: Climate Change, Livelihoods, Semi-Arid Regions, Zimbabwe
The Socio-Economic Effects of Cross-Border Migration on Zimbabwe’s Border Lying Communities - A Case Study of Beitbridge and Plumtree

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ABSTRACT

Zimbabwe has in the past decade (since the year 2000) undergone what some commentators have called ‘the largest migration event in the region’s recent history...’ driven by deteriorating economic conditions. This paper seeks to assess the nature and magnitude of the emigration patterns and the implications that this migration has on the demographic structure of the communities and on various socio-economic sectors. A specific focus is made on education and agriculture. The study uses a mixed-methods approach to investigate the effect of migration on border lying communities in Beitbridge and Plumtree specifically focussing on the demographic structure of the communities, agriculture and education. The paper concludes that outward migration in the areas studied in this paper has fundamentally altered the age structure of the population with important implications for population growth rates, business, politics, agriculture and education. The paper argues that chronic food insecurity; high failure rates in schools and declining population growth rates may be partly attributed to the migration phenomenon. Contrary to common belief that migrants improve their former households’ welfare through remittances, the paper concludes that most of the non-skilled migrants originating from these rural areas often struggle to meet their own survival needs.

Key Words: Migration; Border lying areas; Remittances; Demography; Education; Zimbabwe
ABSTRACT
This paper contributes to emerging research on the impacts of climate change on communities in the Global South by mapping and analysing its impacts on rural livelihoods in semi-arid Matobo District in Zimbabwe. It investigates the possibilities and scope for climate change adaptation in this region as communal households adjust and diversify their livelihood portfolios. In so doing, it finds that climate change has had remarkable consequences on the livelihoods of people in this semi-arid area. It has altered the ecosystem leading to the disappearance of certain plant and insect species that were an essential part of the local natural habitat and livelihoods of local people. Rainfall patterns have also become unpredictable leading to erratic, mostly, poor farming seasons with direct implications on the local food system and rural economy. In response to these climate change induced impacts, a variety of new livelihood strategies are emerging as households seek to cushion themselves against this threat to their sustainability. However, a pertinent question is: how far can these adaptation strategies evolve under the increasing pressure of climate change impacts? In other words, are these communal households urging towards tipping points?

Key Words: Climate change; temperature; precipitation; livelihoods; impacts; adaptation.
A Critical Analysis of the Use of the ICTs in the Documentation and Publication of Oral Traditions

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ABSTRACT

This research paper focuses on the documentation of oral traditions and making them available to the masses through utilization of Information and Communication Technologies (ICTs). This research looks at how ICTs can help in documentation and publication of oral traditions to the masses through designing and implementation of an Izaga Electronic Database which will be tested amongst linguistic students at a Zimbabwean university and selected Isindebele learners from the rural areas and around Bulawayo. This research uses modernism as its theoretical framework; it looks at the change from traditional ways of doing things where oral traditions were passed on from one person to another through oral communication, to the 21st century utilization of ICTs where oral traditions can be captured by one individual and broadcasted to masses. The research established that oral traditions can be documented and published to the masses through the usage of ICTs as an Izaga Electronic Database was implemented. The response from the evaluators was overwhelming therefore proving that the usage of ICTs can help in the documentation of oral traditions. The research therefore recommends that the government should come up with an IT policy which will promote teaching of computers in schools and subsidize prices for ICT products for school or student purchases. Local universities should also offer computational linguistics to improve in the development of ICT packages in local languages.

Key Words: Information communication technologies, izaga (proverbs), critical analysis, oral traditions, computerization.
Public Perceptions of Climate Variability Risks on Wetland Management: A Case of Ward 15 of Matobo North District, Zimbabwe

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ABSTRACT
Wetlands are unique for storing water from storms; recharging ground water and serving as the habitat for a variety of aquatic organisms, wildlife and plants, including rare, threatened, endangered and endemic species. However, climate variability has led to the shrinking and drying up of most wetlands in Zimbabwe. This study looked at the public perceptions of climatic experiences in their environment, level of knowledge about wetland management and attitudes towards implementing these strategies. Data collection and analysis was based on field surveys in two villages around Intunjambili wetland, including five focus groups, questionnaires (five point Likert-scaled) given to 27 households, structured interviews and observations. The results indicate that a significant proportion of the locals are aware of the dynamics of the local climate; the majority of the participants have heard of climate variability but very few know the causes. The majorities of the participants use indigenous knowledge systems to conserve their wetlands and are reluctant to implement scientific methods as they are perceived as expensive. The study points to the need to encourage residents to merge scientific methods and indigenous knowledge systems in wetland management and to increase outreach about the climate variability risk, for sustainable environmental management.

Key Words: Climate variability, Climate risk, Wetlands, Perception
Analysis of the Relevance of Traditional Leaders and the Evolution of Traditional Leadership In Zimbabwe: A Case Study Of Amandebele

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ABSTRACT

This article analyses the Ndebele institution of traditional leadership in contemporary Zimbabwe. It traces the pre-colonial Ndebele traditional leadership in order to establish the changes that have occurred as well as their causes. The article highlights the importance of indigenous knowledge systems (IKS), especially in leadership which is highly controversial in Africa. Traditional leadership is the indigenous way of leadership which can, in a good way, influence contemporary governance for the benefit of people. The article takes an Afrocentric approach with a clear understanding of the dynamism in culture. It then proceeds to reveal the problems (and their causes) within the traditional leadership institution in contemporary Zimbabwe. Finally, the article recommends solutions to the problems.

Key Words: Afrocentric; alienation; chieftainship; Christianity; gender; indigenous, Knowledge systems (IKS); partisanship; politicisation; succession; traditional leaders
The Philosophy of Sustainable Development As Depicted In the Proverbs of Amandebele

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ABSTRACT

This paper looks at the aspect of development as depicted in proverbs. Proverbs are a part of oral literature, which is an integral part of the Africans. The research makes the assumption that sustainable development is not a phenomenon that was introduced by the West through colonisation, but it has always been there in Africa. Therefore, in order for the Western concept of development to be meaningful to Africans, it must incorporate the African concept of development. This form of development is contained and expressed in African philosophy, of which proverbs are a part. The paper begins by explaining what development is. It then proceeds to explain what sustainable development is today and then link it to the African context. The paper also explains what proverbs are, their structure and the philosophy behind them. It goes on to identify and analyse those proverbs that are inclined towards development. This is done while at the same time explaining ‘development’ in the African context. The main focus is on the Ndebele proverbs. However, some reference is made to proverbs from other African communities, especially Bantu societies which share a lot of characteristics with the Ndebele people. Reference is also made to the development agencies such as non-governmental organisations (NGOs), government departments and other organisations and individuals who have been involved in matters of community development in one way or another. Case studies will be drawn from the activities of these agencies in order to see whether they have succeeded in fulfilling their mandate or not.

Key Words: proverbs, sustainable development, African philosophy, western ideology
ABSTRACT
Climate change is one of the major challenges that are confronting developing countries. Rural women in Zimbabwe are one of the most hard hit populace groups. The study sought to investigate how rural women are affected by climate change in relation to their livelihoods. It also explores women’s perception of climate change and the effects of those perceptions on adapting to climate change. Emphasis is made on the effects of climate change on crop production, livestock production and water sources focusing on Tsholotsho District in Zimbabwe. The study used a qualitative approach to obtain data on the effects of climate change. One of the major findings of the study was that the impact of climate change undermines women’s livelihoods which are rain-fed thus leading to accelerated food insecurity problems and heightened impoverishment. The paper concludes that women in rural areas must be prioritized in development programming especially in agriculture to ameliorate impending and inevitable climate change induced food insecurity.

Key Words: Climate Change, Livelihoods, Adaptation, Zimbabwe
Gender, Irrigation Schemes and the Empowerment Question. Untold Experiences of Communal Irrigation Plot Holders In Zimbabwe

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ABSTRACT

With an estimated 70% of the 11.6 million Zimbabweans living in impoverished rural areas, and dependent on smallholder agriculture for their livelihoods, it follows that improvements in this sub-sector can contribute to poverty alleviation, particularly food insecurity. This depends on appropriate water management in such a semi-arid climate, like that of Umzinyatini Irrigation Scheme of Matabeleland South. This scheme possesses a lot of potential to boost food security in the district of Umzingwane. Gender sensitive policies from NGOs and Government Institutions need to be developed to harness the gigantic agricultural potential of the Scheme. Little information is recorded on smallholder irrigation schemes in Africa. Most of the information, which does exist, relates either to the area of land irrigated or volume of production. On farmer managed schemes, recorded information generally relates to the financial needs of the system. There are virtually no data relating to the activities of men and women separately. A major paradigm shift is needed to address the imbalances related to gender and sustainable smallholder irrigation.

Key Words: smallholder irrigation, water management, sustainability, and empowerment.
The Effects of Teacher Incentives on Education In Bulawayo, Zimbabwe

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ABSTRACT

Upon independence the Government of Zimbabwe recognised the central role played by education in any society in improving the lives of citizens. The government profoundly invested in the provision of education for its citizens through payment of teacher’s salaries. Zimbabwe's education system, once the most excellent in Africa, faced enormous challenges during the peak of the economic and political crises in 2008/2009. In view of the fact that education is an essential base for a child’s bright future, parents who had the resources arranged with teachers to privately teach their children. During this period the provision of incentives was a splendid idea meant to cushion teachers from the hyper-inflationary environment the country was facing in a bid to avoid strikes, which would affect children's learning. The Ministry of Education Sports and Culture formalized the incentive system through Circular No. 5 of 2009. The study sought to investigate how incentives rejuvenated the education sector and at the same time how they have negatively affected the system. Teacher incentives were a positive move on short term basis. The findings of the study were that in the long run the incentives have negatively affected the education sector, parents, children and the teachers. The paper will discuss how these different stakeholders were affected by the teacher incentives.

Key Words: Teacher incentives, Education, Dynamics, Effects.
A Critical Analysis of the Translation Strategies Used By Pathisa Nyathi In The Book Traditional Ceremonies Of Amandebele (2001)

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ABSTRACT
The aim of this research is to reveal the problems that are encountered when writing culture bound words from the Ndebele language to English language. This is done with special focus on the book Traditional Ceremonies of Amandebele (2001) by Pathisa Nyathi. The problems he encountered are highlighted and the strategies he took to overcome those problems are discussed. This research discussed elements that qualify cross cultural translation as a special translation that is different from other forms of translations. The findings of this research reveal that borrowing is often used when a translator is faced with the problems of untranslatability, however there are some other strategies like adaptation, transliteration and transportation that can be used.

Key Words: Translation strategies, culture, tradition, untranslatability, translation procedures.
ABSTRACT
Skating on thin ice is how best to describe the recently passed decade (2000-2010) that has seen all the Universities in Zimbabwe Libraries face extraordinary hard times in the area of acquisitions. This was a time for desperation, where each university library was clutching onto any possible lifeline for survival that could keep the Library and indeed the University itself from total collapse in the country in the early 2000s, and the worsened state of affairs for universities due to the runaway economic inflation, limited foreign currency reserves, high and prohibitive subscription rates for journals, costly prices of books, dwindling University budgets as well as the phenomenal growth in demand for higher education, all this culminated in the near collapse of the University Libraries. During this time, acquisition of learning resource materials changed status from being critical and core for the success of the university programmes to luxury goods as other issues like having a meal on the table on a daily basis began to take centre stage. This was our reality and the nightmare seemed to end in 2009 after the introduction of the American dollar as a medium of exchange replacing our Zimbabwean dollar that had been devalued to an incomprehensible value, only then did the economic recovery begin. Issues of sustainability for Library resources were addressed by the Open Society Institute of Southern Africa that encouraged and funded the establishment of the Zimbabwe University Libraries Consortium in 2001 for the purposes of cooperation and resource sharing, the International Network for the availability of Scientific Publications(INASP) who introduced electronic resources through their Programme for the enhancement of Research Information(PERI)and sponsored many training programmes for the Librarians, the Institute of Commonwealth Universities (ICU) low cost e-journal programme, Book Aid International and other organisations that have annually provided current, relevant printed books to all our University Library without fail. Finally, the current practices in our various Libraries will be discussed and the bright future ahead that waits our ZULC libraries.

Key Words: Libraries, Acquisition, Inflation, ZULC
ABSTRACT
The aim of this research was to come up with strategies that could identify the different business model engaged by the local authorities, determine business models at the nerve of local authority failure in the Income generating projects, identify obstacles faced by councils for them to change their model, propose business modelling in councils as well as mapping the strategic needs for business modelling. With a tense competitive environment to which the organisations is exposed to, thus apart from the ever changing consumer taste and demands in the macro- economic environment the researchers found out that the income generating projects were not performing well in the market compared to other private operators. Despite the fact that the income generating projects have been subjected to fierce competition after de-regularisation in some sectors allowing new independent player to operate, still there was a gap that needed to be filled as their performance is in doldrums. The literature has also been used to draw recommendation and conclusions, Questionnaires were the main source to extract information in the field of survey. Local authorities, custodians of local governments and interested parties were engaged from the southern region of the country, Zimbabwe. Careful analysis of the data gathered was done by using both qualitative and quantitative data analysis methods. Some of the recommendations include practising total quality management, customer and public relations apart from having business modelling as a practice in the management of income generating projects.

Key Words: business model, contemporary business, income generating projects, environment
ABSTRACT
The researchers seek to evaluate the impact of auditing fraud management. It endeavors to bring harmony to fraud management and fraud constraints medical industry has been facing in the form of cash mismanagement, inventory pilferage and asset mismanagement. Primary data and secondary data was used to extract wealth and golden information that is relevant and in harmony with the research question. Questionnaires, interviews and participatory observation were used as research instruments to gather relevant information related to this research. Further information was gathered from associations’ library and financial files. Descriptive research design was used because it endeavors to describe record and analyze relationship between variables. Massive consultation, research and references were made from accredited authors with information linked to the research topic understudy. A review of related literature on auditing and fraud was carried out in a bid to establish what other renowned authors had to say on the issue of impact of auditing on fraud and its irregularities. The authors used the descriptive survey research design with information being obtained from the management, employees and executive members. A total percentage sample size of 83% was used to extract information. Deductive and inductive designs were also used to analyze data. Findings from the study undertaken revealed that auditing impact on fraud management and one cannot talk of fraud management without talking of fraud audit. The findings also revealed that auditing is a vital tool in managing cash, assets and inventory. The authors recommended for the establishment of a fraud management committee, segregate duties and updating audit policies as accounting standards do change regularly.

Key Words: Auditing, fraud management, cash and asset management, inventory pilferage
The Effects of Separating Ownership and Control on the Performance of Retail Stores in Southern Zimbabwe

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ABSTRACT
The effect of separating ownership and control is one of the debates that have been going on from the 17th century to today. There has been mixed evidence of whether the value of a firm and rewards to shareholders increase if the owners are involved in running these businesses or if they outsource the management function to professional managers or directors. The aim of this paper is to unravel issues surrounding managerial ownership and the ultimate effects on performance. While there has been meagre research on this topic among Zimbabwean academics enumerated evidence of studies around this topic elsewhere is unquestionably apparent. Using a sample of thirty grocery reputable franchised stores in southern Zimbabwe the research put to test the three corporate governance theories namely agency, stewardship and stakeholder. Unlike previous researchers who relied on published data we used financial performance measure such as sales, gross profit, and customer account and store size to test whether these are affected by the ownership and management structure. The results led to the conclusions that there is no significant difference between owner managed firms and non-owner managed firms in reference to the franchised stores reviewed.

Key Words: Ownership, Control, Performance, Corporate governance
An Investigation into the Effectiveness of Marketing Strategies Employed By Zimbabwean Insurance Companies for Creating Competitive Advantage

Tapera, J. and Gororo, R.

Department of Accounting and Finance, Lupane State University,

**ABSTRACT**

The Zimbabwean Insurance Industry has continued to see an increase in the number of players entering the market on one hand and a shrinking market at the back of an underperforming economy on the other hand. This has resulted in both old and new players in the insurance industry scrambling for the few clients who still see value in taking up life assurance policies especially after the losses that they suffered when the Zimbabwean economy adopted the multicurrency system. This challenge has been coupled with the influx of many new insurance companies that have joined the industry since the introduction of the multicurrency system. Competition in the industry has therefore been inadvertently on the increase over the years. It is against this background that the researchers sought to investigate into the various strategies that different players within the insurance industry have implemented in creating competitive advantage to attain improved organizational performance and sustainable growth. The objectives of this research were; to identify the different strategies that have been formulated and implemented by various organizations in the insurance industry in creating competitive advantage within the insurance industry; to measure the effectiveness of these strategies in creating competitive advantage; to identify the various challenges in the formulation and implementation of marketing strategies designed to create competitive advantage; and, to identify and recommend possible solutions to challenges faced in strategy implementation as organizations endeavour to continuously create competitive advantage. A cross sectional survey methodology was used to gather data from a sample of organizations within the insurance industry and two instruments were largely used for data gathering; the questionnaire and the depth interview guide. Results were analysed and the following conclusions were drawn; organizations in the insurance industry largely use differentiation and low cost strategies, their products are intensely distributed using multiple agents and brokers, personal selling and advertising are also used as the main promotional strategies, and the use of human capital to create competitive advantage is becoming more extensively used by most organizations in the industry. It was on the basis of these conclusions that the researchers made the following recommendations; organizations in the insurance industry to regularly carry out comprehensive market researches to identify customers’ ever-changing needs in a dynamic environment, efforts have to be made to satisfy these identified customer needs if insurers are to effectively create competitive advantage, there is need to increase the level of giving customers value for money through enhanced product features and benefits, insurers can aggressively use ICTS to extensively promote their products to their various target markets.
markets, the use of physical evidence to create competitive advantage can be further explored and there is need for redefining organizational systems so that they become more robust in facilitating efficient service delivery. These recommendations are envisaged to significantly benefit players in the insurance industry, if they are to continuously create competitive advantage for superior performance and sustainable organizational growth.

**Key Words:** Competitive Advantage, Marketing Strategies, Insurance, Life Assurance
The Importance of Strategic Management to Business Organizations

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ABSTRACT
This paper presents strategic management as an important business management concept. It defines strategy and explains the key concepts in strategic management; strategic vision, objectives, strategy formulation, strategy implementation, evaluation and initiating corrective action. The research also focuses on the corporate governance aspect of strategic management; role of the board of directors in crafting and executing strategy. The different levels of pitching strategy are also discussed in this paper; corporate, business, functional and operational. All these concepts are examined with a view to highlight their importance in the effective and efficient management of business organizations. In an operating environment that is dynamic and highly competitive, business organizations need to appreciate the importance of crafting and effectively executing strategies that can help them create sustainable competitive advantage.

ABSTRACT
This research looks at an analysis of the impact of cultural transfer on organizational performance in the financial services sector, culminating from high employee mobility within the industry in Zimbabwe. The industry has been characterized by high employee mobility in an environment where each and every financial institution should ideally have a unique culture, resulting in a distortion of the uniqueness of these respective organizational cultures and other strategic interventions, which organization would normally focus on in endeavouring to create competitive advantage and optimize organizational performance. Some of these interventions include human resources development, strategic management (formulation, implementation, evaluation and control), organizational development, change management, as well as mergers and acquisitions, among others. The objectives of the research are to: assess how staff mobility in the financial services sector impacts on the transfer of different organizational cultures from one institution to the other; evaluate the correlation between organizational culture and organizational performance; evaluate the impact of recruitment, selection, training and development and other human resource interventions in shaping organizational culture; and evaluate the impact of organizational culture on organizational strategy formulation, implementation, evaluation and control. The findings of the research revealed that: employee mobility results in cultural transfer; corporate culture influences strategy formulation and execution; corporate culture has an impact on all human resource management interventions; culture determines responsiveness to environmental changes and affects the management of change; and corporate culture influences ethical business conduct.

Key Words: Organizational Culture, Organizational Performance, Financial Institutions Transfer
An Investigation into the Effectiveness of Marketing Strategies Employed By Zimbabwean Insurance Companies for Creating Competitive Advantage

Tapera, J. and Gororo, R.

Department of Accounting and Finance, Lupane State University

ABSTRACT

The Zimbabwean Insurance Industry has continued to see an increase in the number of players entering the market on one hand and a shrinking market at the back of an underperforming economy on the other hand. This has resulted in both old and new players in the insurance industry scrambling for the few clients who still see value in taking up life assurance policies especially after the losses that they suffered when the Zimbabwean economy adopted the multicurrency system. This challenge has been coupled with the influx of many new insurance companies that have joined the industry since the introduction of the multicurrency system. Competition in the industry has therefore been inadvertently on the increase over the years. It is against this background that the researchers sought to investigate into the various strategies that different players within the insurance industry have implemented in creating competitive advantage to attain improved organizational performance and sustainable growth. The objectives of this research were; to identify the different strategies that have been formulated and implemented by various organizations in the insurance industry in creating competitive advantage within the insurance industry; to measure the effectiveness of these strategies in creating competitive advantage; to identify the various challenges in the formulation and implementation of marketing strategies designed to create competitive advantage; an, to identify and recommend possible solutions to challenges faced in strategy implementation as organizations endeavour to continuously create competitive advantage. A cross sectional survey methodology was used to gather data from a sample of organizations within the insurance industry and two instruments were largely used for data gathering; the questionnaire and the depth interview guide. Results were analysed and the following conclusions were drawn; organizations in the insurance industry largely use differentiation and low cost strategies, their products are intensely distributed using multiple agents and brokers, personal selling and advertising are also used as the main promotional strategies, and the use of human capital to create competitive advantage is becoming more extensively used by most organizations in the industry. It was on the basis of these conclusions that the researchers made the following recommendations; organizations in the insurance industry to regularly carry out comprehensive market researches to identify customers’ ever-changing needs in a dynamic environment, efforts have to be made to satisfy these identified customer needs if insurers are to effectively create competitive advantage, there is need to increase the level of giving customers value for money through enhanced product features and benefits, insurers can aggressively use ICTS to extensively promote their products to their various target markets.
markets, the use of physical evidence to create competitive advantage can be further explored and there is need for redefining organizational systems so that they become more robust in facilitating efficient service delivery. These recommendations are envisaged to significantly benefit players in the insurance industry, if they are to continuously create competitive advantage for superior performance and sustainable organizational growth.

**Key Words:** Competitive Advantage, Marketing Strategies, Insurance, Life Assurance
AN ANALYSIS OF TURNAROUND STRATEGIES USED BY RURAL DISTRICT COUNCIL’S IN THEIR INCOME GENERATING PROJECTS: A CASE OF RURAL DISTRICT COUNCIL’S IN THE SOUTHERN ZIMBABWE

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ABSTRACT

This research was undertaken with the main objective being to analyse the turnaround strategies being employed by rural district council run income generating projects. The research also seeks to establish the causes of failure of council run income generating projects strategies used by management in managing projects. This was exacerbated by observations noted on the level of contribution to council budget and unsatisfactory performance. The author reflected on existing literature, on turnaround strategies used by local authorities in their income generating projects, implication on productivity, profitability. With the use of questionnaires in the sample size of 38 respondents, drawn from a sample population of 58 senior managers from rural district councils in the southern Zimbabwe, the researcher found that most respondents were running income generating projects. This was confirmed by the 100% of response rate. The most prominent strategies on income generating projects were found to be renovation of premises owned by local authorities, employment of contract workers and entertainment provision. This was evidence by 16, 22 and 14 respondents respectively. The results revealed that major causes of income generating projects were emanating from the inadequacy of funding amongst other causes. It is in the height of the main findings and the main recommendations that the researcher recommend that managers should embark on other strategies that might help councils realise some positive results.

Key Words: turn around, strategies, rural district council, income generating projects.

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Faculty of Humanities and Social Sciences (Unpublished Papers Abstracts)

285. An Investigation into the Use of Ethno-Veterinary Medicine in Sustaining Livestock at Gwaai Resettlement Area

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Department of Languages, Lupane State University

ABSTRACT
This research sought to investigate the use of ethno-veterinary medicine in sustaining livestock in Gwaai resettlement area. The study looks at a survey of the prevalent cattle diseases in the area, their causes as well as the traditional methods of treating the affected animals. Questionnaires and interviews were used to gather information about the useful herbs including their preparations and how they are used to combat diseases. It was established that due to the high cost of modern veterinary medicines, farmers rely on indigenous resources such as plants to treat diseased animals; and such practices are done in most parts of the world. The geographical location of the area understudy also contributes to the lack of access to information by the local farmers as it is remote and this consequently leads to them losing their livestock. However, the use of locally available herbal plants has proved to be a reliable method of treating livestock. It is also recommended that such valuable indigenous knowledge be well documented for future reference because currently, it is being orally transmitted.

Key Words: Ethno-Veterinary medicine, Livestock, Indigenous resources, Modern veterinary medicines, Cattle disease, Farmers
Subject Marker Metamorphosis in Tonga Imperative Constructions

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ABSTRACT
The article discusses subject marker metamorphosis in Tonga with specific reference to imperative constructions. The term metamorphosis is synonymous with complete change, alteration, transformation or transmutation of something. Our focus is on subject marking in people classes (gender 1/2). The structure of a regular gender 1 subject markers u- and that of a regular gender 2 subject marker ba- are mutated in the process of imperativizing a subject noun phrase of a kernel sentence. Imperative sentences can be vocative/ non-vocative, direct/ indirect and affirmative/ negative. The imperatives are investigated at morpho-syntactic level in this paper. Imperativization is discussed in the context of an addresseee and anaphoric referencing. The article submits that imperativization of subject noun phrase, in some instances; block the regular verbal subject markers by licensing irregular subject markers to link a subject noun phrase to the verb phrase.

Key Words: Kernel, transform, imperativization, addressee, empty morph, morpho-syntactic and anaphoric referencing.
Emerging Trends in Arts Entrepreneurship: The Case of Amakhosi Cultural Centre

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Department of Languages, Lupane State University

ABSTRACT

This paper critically analyses how Amakhosi Cultural Centre has positioned itself strategically in the arts and culture sector of Zimbabwe with an entrepreneurial approach. Amakhosi Cultural Centre is one of the leading arts and culture institutions in Zimbabwe. This paper notes that of late Amakhosi has come up with a unique strategy of marketing and distributing its arts and cultural products. This strategy comes in the form of Amakhosi Cultural tours which packages tours to heritage sites in and around Bulawayo together with theatrical performances taking place at the Cultural centre. This strategy is also coupled by the adoption of the 6Ps of the marketing mix, which is used as a model to market their services. This paper also notes that Amakhosi has taken a radical shift in the way they schedule their performances, coming up with schedules that deviate from the norm but which are, interestingly, meeting the demands of the dynamic audiences of the 21st century. The cultural tours offered by Amakhosi are also seen as promoting the history and heritage of the people of Bulawayo in particular and Zimbabwe in general in line with UNESCO recommendations. This paper concludes that the entrepreneurial strategies devised by Amakhosi cultural Centre are meeting the demands of the 21st century audiences and tourists and through such relevance they are contributing to the building of a sustainable arts and culture industry that benefits the arts and culture practitioner, the arts and culture industry and the society at large.

Key Words: marketing mix, product, place, price, promotion, positioning, people, cultural tourism
“Akusilima Sindlebende Kwaso”: The Ndebele Perception of Disability and Implications for Social Development

Maseko, B., Ncube, B., Moyo, C. and Dhlamini, N.

Department of Languages, Lupane State University

ABSTRACT

The paper interrogates the African perception of disability with particular reference to the Ndebele Society. This is done through the examining of the traditional view of disability as informed by the traditional Ndebele philosophy and worldview vis-à-vis the contemporary conceptions of disability. The paper argues that, in the traditional Ndebele society, disability was viewed as a result of witchcraft or some form of misfortune and hence, people with disabilities were treated as outcasts and excluded from mainstream developmental projects. As a result people with disabilities were seen as burdensome rather than potential agents of development. The paper observes that in the contemporary society, disability is slowly being demystified and as such, people with disabilities are being accepted as potential agents of development. We conclude that more needs to be done to conscientise society on the calamities of excluding people with disabilities from mainstream society.

Key Words: Ndebele society, tradition, disability
A Sociolinguistic Analysis of the Perceptions That People Have About Asian Products in Zimbabwe

Ndlovu, M. and Dube, P.

Department of Languages, Lupane State University

ABSTRACT
This study is in the area of language and society. It looks at the new terms that have been created and the extension of meaning on the already existing terms that has been brought about by the presence of Asian nationals and their products in Southern Africa. The paper begins by giving and highlighting the background behind the heavy presence of Asian, especially Chinese nationals and products in Zimbabwe. It goes on to discuss and analyse how the perceptions about the Chinese and Japanese have changed over the last decade or so, as a result of the heavy inflows of their cheap quality products. These products have become a part of the Zimbabwean culture and Zimbabweans, like other southern African nationals, have come up with words which they use to describe these products. Language is a carrier of culture; therefore, anything that becomes a part of culture of a people is expressed using language. The paper looks at both the benefits of this look East policy and the negative impact it has had on the domestic scene. The research argues that the dominance of the negative terms about the Asian products and the influx of those products is testimony that the look east policy has done more harm in the long run. This has created perceptions that anything that comes from the east is for short term use only and should not be taken seriously.

Key Words: Asian products, cheap quality, low quality, low prices
Faculty of Agriculture (Unpublished Papers Abstract)

290. The Impact of Winter Production of Traditional Vegetables on Household Food Security: A Case Study of River Bed Alluvial Deposits Traditional Gardens in Hwange District, Matabeleland North Province.

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ABSTRACT

Traditional vegetables have been consumed by many rural communities for centuries and have a potential to contribute to household food security by providing direct access to readily accessible nutritious food and income. The availability of fresh vegetables is however seasonal but local communities in Hwange have made it an all year round activity. To assess the production and availability of the traditional vegetables, a survey was conducted in July to November 2013 in Nekatambe Ward of Hwange District. The study was aimed at identifying and assessing the indigenous production systems, consumption and the role of traditional vegetables in income generation, food security and livelihoods of the households. Data was collected through focus group discussions, field observations and questionnaire surveys on forty households. Results showed that traditional vegetables were produced in abundance in winter so that households had vegetables all year round. The winter vegetables are cultivated in the alluvial deposits in river beds. The traditional vegetables are produced organically using manure, organic pest control and intercropping with no inorganic fertilisers. Basin irrigation is used for watering. 47% of the respondents make over US$150 per month from the sale of vegetables. Marketing is informal and some vegetables are sold through barter and trade. Income generated is used to buy non food items and invested in small livestock. Information on agronomy, nutritive value and methods of preparation that minimise nutrient leaching is scarce among the communities.

Key Words: Traditional vegetables, basin irrigation, alluvial deposits, rural communities.
ABSTRACT
Farmers at Umguza Irrigation Lots practise unrestricted crop production using undertreated wastewater. This presents potential public health risk to producers, vendors and consumers of the produce. The aim of the study was to establish the level of public health risk of wastewater use in unrestricted crop production at Umguza Irrigation Lots. Water samples from the dam, canal and overnight reservoir and vegetables: Lactuca sativa, Brassica oleracea and Solanum lycopersicum were obtained and analysed for physiochemical and microbial characteristics. The results of the study revealed that the farmers grew salad crops using wastewater. The mean pH, EC, DO of the water was 8.9, 866.9µS/cm and 607.6 ppm. The EC value was far less than the 2000µS/cm FAO guidelines. Escherichia coli O157, Shigella, Salmonella and Staphylococcus aureus were isolated in the wastewater with a steady decrease in pathogen concentration as the rain season progressed. The same trend of decrease was also observed on vegetable samples. The level of contamination by pathogen was noted to be ranging from significantly low to nil, where drip irrigation system was used. Future research is recommended to determine the extent of contamination and conduct confirmatory test like Biochemical tests or Quantitative Real-Time Polymerase Chain Reaction.

Key Words: Waste water, faecal coliform, pollution, unrestricted irrigation
An Evaluation of the Total Crop Benefit for a Butternut Squash - Okra Intercrop under Furrow Flooding Irrigation

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ABSTRACT
An experiment was conducted in order to determine the economic and agronomic viability of intercropping okra with a butternut squash crop at Glengarry peri-urban plot, Bulawayo in August 2013. Furrow irrigation was used with water abstracted from a shallow well. Three plots of 12 metres by 10 metres area were each assigned to sole butternut, sole okra and the intercrop. Results showed that the intercrop gave a Land Equivalent Ratio of more than unity, translating into land saving of 22, 48%. Okra pod production was however delayed due to intense shading during early growth. The okra crop was also heavily infested with powdery mildew and leafminer but recovered after the senescence of the butternut squash. Intercropped okra grew significantly taller and less primary branching than the sole crop (p≤0.05). Hence on the basis of Land Equivalent Ratio and the Percent Land Saved it is beneficial to intercrop butternut squash and okra although a deeper analysis of the timing and spacing of the okra and butternut squash intercrops needs to be done.

Key Words: Intercropping, Land Equivalent Ratio, Percent Land Saved, Butternut Squash
The epidemiology of malignant catarrhal fever (MCF) and contribution to cattle losses in farms around Rhodes Matopos National Park, Zimbabwe

Dedani Mlilo, Mlamuleli Mhlanga, Richard Mwembe, Givious Sisito, Busani Moyo and Boat Sibanda.

ABSTRACT

Malignant catarrhal fever (MCF) is a fatal viral disease of cattle prevalent in farms bordering wildlife conservancies and national parks where cattle and wildebeests cohabit. The behaviour of the diseases and its related contribution to cattle mortalities has been poorly studied in the smallholder sector. A study was therefore conducted to established trends of occurrence and contribution to animal losses in 97 smallholder farms and eight commercial farms bordering Rhodes Matopos National Park (RMNP). A structured questionnaire and secondary records were used to gather the data in the smallholder and commercial farms, respectively. In the smallholder sector, cattle farmers from three villages were chosen as respondents in a survey to provide information on the impact and extent of losses in their cattle herds. Epidemiological data from January 2006 to April 2014 was extracted from farm records from two Matopos Research Institute farms. A seasonal pattern in MCF occurrence was observed. Most cattle mortalities were recorded during summer (February to May), with highest mortalities recorded from March to April. Sporadic cases were however recorded in October and November in year 2007, 2010, and 2012. The study further revealed that MCF caused 71 and 21 % of cattle mortalities in the commercial and smallholder sector, respectively. Deferred grazing of wildebeest hotspots by restriction of cattle movement during summer or November to April period avoids wildebeest-cattle contact. This can alleviate cattle mortalities due to MCF.

Key Words: Commercial, Mortalities, Occurrence, Smallholder, Trend, Wildebeest
Marymount Teachers College

294. Stress Management among Female Student Teachers-The Case Of Marymount Teachers’ College

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ABSTRACT

One of the major challenges facing student teachers on attachment teaching practice is coping with stress. This study examines some of the forms of stress, their causes and means of dealing with the stress from the perceptions of female student teachers, mentors and lecturers. One hundred (100) female student teachers, forty (40) mentors (teachers and school heads) as well as ten (10) male and ten (10) female lecturers were involved in the study. Data was collected through open ended questionnaires and interviews. The study established three (3) main categories if stress which were home-based (socio-economic), school-based (academic, professional and socio-economic) and college-based (academic and socio-economic). Common sources of stress were inadequate support from home, ineffective mentorship, high college expectations and harassment by lecturers. 95% of the students considered high college expectations as the topmost stressor, while the majority of the lecturers were of the opinion that the main causes of stress were institutional. The study suggests coping mechanism to reduce the ugly effects of stress on students on attachment teaching practice.

Key words: Stress, stressor, management, coping mechanism

Date of completion: June, 2014

Article was published in the International Journal of Social Sciences and Education volume 4 Issue 2, 2014
ABSTRACT
This study explores and discusses the reality of gender mainstreaming in a Zimbabwean Teachers’ College, Marymount within the context of changing mind sets. Gender equity and gender equality are considered inevitable products of persistent demands by the global society for change to realize harmonious social integration and social co-existence. The study acknowledges the need for a social transformation within institutions of higher learning like Teachers’ Colleges to shift towards the ideal goal of gender equity and gender equality. Global, regional, national and institutional policy provisions and practices are used as reflections of existing mind sets. Reflections are also made on gender perceptions in the student and staff structures in the College through the use of the SWOT and Force Field analysis frameworks. It is expected that insights will be made that may apply to other similar institutions. Analysis of documentary evidence in the form college policies, recruitment statistics and other such issues is used in the data collection process. This is complemented by oral interviews with critical stakeholders like policy makers and student teachers hence a mixed methods research design. The study established that it was possible to change mind sets at college level due to several opportunities although there were also of restraining forces that were to be dealt with.

Key words: Gender, mind set, mainstreaming, idealism, reality, intake

Date of completion- August, 2014 – Paper was published in the Conference Proceedings on Gender Mainstreaming at Higher Education Institutions, September, 2014
Sustainable Resource Management in Zimbabwe: - A Study of Farmers Perceptions of Model a -Chikomba 1 Resettlement Scheme (1980-2014)

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ABSTRACT
One dominant issue in the controversial debate on post-independence land resettlement in Zimbabwe has been the effectiveness of resettlement and possible solutions to challenges experienced. Land resettlement goes a long way in empowering Zimbabweans in line with ZIM-ASSET but issues of sustainability arise when challenges concerning land resettlement are experienced as is happening today. This study investigates the perceptions of Model A farmers in Chikomba in an effort to establish these challenges and solutions. The objectives of the study were to establish the challenges experienced by farmers of Model A in Chikomba Resettlement Scheme and possible solutions and to determine the impact of the Model A resettlement scheme in Chikomba. A case study was carried out using fifteen respondents who were selected purposively from settlers in eleven villages. Data were collected through interviews and on-site observations. Data was analysed using descriptive statistical analysis. It was found out that farmers in Chikomba Resettlement Scheme prefer to be settled in the Model A 1 resettlement programme but were experiencing many social, political and economic challenges. Population pressure on these schemes has led to unsustainable use of natural resources resulting in serious environmental degradation. It is however possible to bring harmony to these settlers through provision of vital services and resources, introducing local fund-raising (income generation) and fund serving schemes to promote self reliance, effective implementation of environmental management policies and regulations.

Key words: Resettlement model, sustainability, perceptions, empowerment, environmental management, land tenure

Date of completion- January, 2015

Published in the Book of papers for the 10th Zimbabwe International Research Symposium, 2015
ABSTRACT
Institutions like Teachers’ Colleges contribute significantly towards empowering student teachers through health provision. This ensures the effective implementation of the national plan of empowering the nation and a growing economy embodied in the ZIM-ASSET programme. This paper demonstrates the role of Marymount Teachers’ College in promoting and maintaining good health through educating and empowering students for national development and developing skills needed to eliminate poor health as well as associated physical and social challenges. The study aimed to establish ways of helping students to take charge of their own lives and make informed decisions on situations around them like abuse, HIV/AIDS and others; develop appropriate skills for good health management and improve utilization of food by promoting good health, hygiene and nutrition management. Areas that need attention were also discussed. A mixed methods design was used which involved interviews with students, staff and other stakeholders. Focus group discussions with students were also carried out on health practices at College, challenges and possible solutions. Evidence showed that students had the ability to get preventive health education through clubs, tuition and could also prevent unnecessary hospitalization. Access to health services could be improved through increasing service time, nutritious food, health education and more effective use of traditional herbs and the College nutrition garden. There were several benefits from networking with partners like Say What, Fact, VVOB etc. through workshops and research. Teachers’ Colleges were priority settings and important change agents because they educated teachers who would be responsible for developing healthy citizens and thus have the capacity to contribute meaningfully to the creation of a healthy nation and realization of the ZIM-ASSET goal of empowering society through good health.

KEY WORDS: Health management system, empowerment, occupational safety, nutritional management, service time, priority setting
ABSTRACT

The current thrust in the school system emphasizes e-learning and the use of Information Communication Technologies (ICTs). When this is done properly, basic ICT skills are developed which have different implications on employment prospects of school leavers. ICTs are capable of providing several employment opportunities in the growing informal sector in Zimbabwe. This study explores some of these employment opportunities available to the Zimbabweans in an effort to promote economic self-sustenance. The study was a survey of Mutare urban businesses where ICTs are commonly used and it used what has been referred to as the “Combo” design to collect data which is a hybrid ‘combination’ of the Technology Acceptance Model (TAM) and the Innovation Diffusion Theory (IDT). “Combo” is capable of determining the attitudes of technology users, usefulness of the equipment and the ease of use of the equipment (TAM) as well as other attributes like relative advantage, compatibility, complexity, among others (IDT). Data was collected from school children (primary and secondary) and ICT teachers and administrators in some of the Manicaland Province urban schools as well as with school leavers who were now informal business owners in Mutare’s Main Street. The study established that there are varying attitudes among influential people in schools like teachers and administrators which would ultimately affect the rate of technology adoption, use at the schools and the benefits that would accrue to the students. Basic ICT competencies acquired at school are being used to establish thriving business enterprises such as eco-cash facilities, cell-phone servicing, internet cafes, software download and installation (Whatsapp, Skype, Anti-virus), selling and buying of various ICT gadgets, recording music CDs and videos and the use of cell phones for business conduct. The study therefore recommends investment in ICTs in schools in terms of provision of equipment and training of teachers and students. This has the potential to create a lot of employment and therefore promote economic self-sustenance.

Key words: E-learning, school leaver, ‘Combo’, technology adoption, usefulness
299. Promoting Good Health through Traditional Foods: A Pedagogical Approach for Primary Schools and Teachers’ Colleges in Zimbabwe

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ABSTRACT
One major health concern in Zimbabwe is increasing access to and coverage of health care particularly among the disadvantaged sections of society, especially the urban and rural poor. This paper places Teacher Education at the centre of the process of providing relevant and enduring education on health care that will improve access to and coverage of health care among people through traditional foods from a very early age in a person’s life. It is argued that empowering student teachers with health education will enable them to reach the poor sections of society through teaching the pupils they will interact with upon completion of their programmes as well as the community through various community projects they will embark on. The paper makes a deliberate focus on traditional food because it is an area that is suffering from the ‘onslaught’ of western or fast foods. It is also important in addressing challenges brought by the Aids/HIV pandemic and other dietary related health problems. The study context was a Teachers’ College environment with student teachers and staff as main sources of information. The study is qualitative and made use of document analysis to collect data particularly on policies and statistics that help to describe issues discussed in interviews. Focus group discussions and observations were also used to gain insights into people’s perceptions and attitudes towards traditional foodstuffs. Observations of meals provided to students as well as the nutrition garden at the College were also done. The study established that Teachers’ Colleges had the capacity in terms of resources and were strategically positioned to enable the increase of access to the low and disadvantaged sections of society through teacher education.

Key words: Good health, pedagogy, traditional foods, empowerment
Assistive/Adaptive Technologies in Tertiary Institutions to Enhance The Functionality Of People With Physical Disabilities

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ABSTRACT

Inclusion in Zimbabwean tertiary institutions is a popular phenomenon in education yet the situation on the ground remains so discriminating and exclusive that it calls for more concerted efforts to realize the nobility of inclusivity in education. Adaptive/Assistive technologies are one of the areas that remain exclusive to the disadvantaged in the country. This study considered the disadvantaged to be people who are less gifted physically, socially and economically in relation to structures in tertiary institutions. It involved tertiary institutions in Manicaland province and this will zero down to institutions in Mutare Urban. Mutare urban tertiary institutions were chosen for the study mainly because of their close proximity and therefore easy access urban tertiary institutions were chosen because most of these are better placed in terms of educational facilities. The study used a mixed qualitative method where questionnaires were administered to students on Attachment Teaching Practice (ATP), lecturers in tertiary institutions and institution administrators. Interviews were also carried out. A sample of 20 was used to have an insight into their perceptions of the prevailing conditions in relation to tertiary institutions and disability friendliness. It was established that, while great strides have been made towards the promotion of inclusivity through student friendly environments, there was need for improvement on infrastructure, equipment and literature; otherwise tertiary institutions remain conspicuously exclusive. It is the conviction of this paper that moving into tertiary institutions is the desire for many people and depriving any of entry opportunities is depriving one of a most basic need for education, entertainment and survival. The paper therefore makes a number of proposals geared towards the promotion of disability Friendly institutions.

Key Words: Assistive technology, adaptive technology, disability.

Date of completion- August, 2015

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Emotional Abuse and Pupil Performance: A Study of Middle Grade School Pupils in High Density Urban Primary Schools in Zimbabwe

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ABSTRACT

This study focuses specifically on the impact of emotional abuse on pupils’ performance on Zimbabwean primary school children who reside and attend school in a high density area of Mutare City. The microcosmic research deals specifically with one middle level class (Grade 5). While the study deals with a specific class and school, the findings are generalizable because of the similar pupil backgrounds and conditions at urban schools. Fifty six (56) Grade 5 pupils, ten (10) parents, the school head and 10 teachers were involved as informants in the study. The study established that the most prevalent forms of emotional abuse were shouting, yelling at children, giving offensive remarks common at both school and home. It was established that emotional abuse was difficult to detect among pupils and it had very negative effects on child performance. Besides affecting the academic performance, emotional abuse also had endemic consequences on social behaviour of the child. A combination methods research design was used which had oral interviews and observations. Document analysis assisted in triangulating information. It was established that emotional abuse can be a product of other forms of abuses because it deals with the mind and it deals with the inner feeling of a person and these may manifest themselves through physical actions. The teacher is a key factor in detection and dealing with emotional abuse. Its detection demands a lot of care and patience on the part of the teacher. Its central nature helps to establish other forms of abuse. Other forms of abuse can cause emotional abuse. This study suggests ways of dealing with emotional abuse in an effort to minimize its impact on pupils’ academic performance which includes keeping a rich social record, adopting a more investigatory approach in social conversations with children and being very observant in and outside the class.
Enhancing Teacher Quality through Education for Sustainable Development: Recycling Technologies to Minimize Environmental Impact- A Case Study of Marymount Teachers College

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ABSTRACT

The aim of education for sustainable development, according to Marymount Teachers’ College, is to expose student teachers to information, skills and concepts so that they can think productively and creatively to promote learning and living in the communities they will serve on completion of their course. In light of the socio-economic situation prevailing in Zimbabwe, one major challenge that confronts teachers, especially those in rural and other marginalized areas around the country, has to do with instructional and learning resources. Teacher education institutions and Marymount in particular, as key change agents, can enhance teacher quality for education for sustainable development (ESD) through imparting knowledge and skills on utilization of waste materials in the local environment to make teaching, learning and play materials for pupils. This re-use and recycling of waste materials is one useful strategy of waste management. The study therefore seeks to empower students with skills in a way to preserve the environment in a manner that accommodates communities facing socio-economic challenges, and good waste management techniques. This presentation will show case some of the learning and teaching materials, media and toys constructed from local junk materials. Videos showing student teacher capacity building will be shown as well. The study relies heavily on observations of students’ practical work and also measures of levels of performance of the pupils in various tasks, hence the use of both qualitative and quantitative techniques of research. Interviews also assisted in capturing and understanding the feelings and sentiments of the participants and the beneficiaries.

Key terms: Sustainable development, Recycling technologies, capacity building

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Mentoring Teaching Practice Primary School Mentors In Zimbabwe: A Contribution To Human Resources Development

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ABSTRACT
The need to establish an education system geared towards transforming and developing society presents serious challenges not only to the curricula offered in Teachers’ Colleges, but also to the practising teachers in schools. They require in-service training and continuous monitoring of their performance. This could be done through the training of mentors or qualified teachers on good mentorship practices and as well as monitoring and evaluation of the practices. This study goes beyond the mentorship prescription of the College to dealing with the mentors’ own attitudes and perceptions on mentorship. It advocates for a value addition process that involves various stakeholders who include the employer Ministry, Teachers’ Colleges, Non-Governmental Organizations and other partners. Teachers Colleges therefore have a critical part to play in this process. This study is an assessment of the impact of teaching practice mentorship intervention on the supervision and assessment of Marymount Teachers’ College students on Attachment Teaching Practice (ATP) in Manicaland Province of Zimbabwe. The study was carried out against a background where mentorship training workshops were held in the six districts of the province in 2009 and 2010. The aim of the study was therefore to assess the impact of this mentorship intervention. The study was mainly a descriptive survey but a mixed methodology was also used to gather as much information as possible through the use of interviews and observations. 100 questionnaires were administered to student teachers and 106 questionnaires to mentors. Selected cases of mentors and students were interviewed and observed. The major findings of the study were that teachers who had been exposed to mentorship training in 2009 were generally better mentors than those who did not. It was also established that there was need to continuously train mentors (mentoring mentors) and add value to cater for new teachers in the system and monitor their practice.

Key words: Mentor, mentee, Attachment Teaching Practice (ATP), intervention
ABSTRACT
The article explores Patricia Chater’s *Crossing the Boundary Fence (1988)* within the framework of Macherey’s (1978) concept of “significant silences”. I argue that in her representation of the decolonisation of Zimbabwe, the writer circumvents pertinent areas that are central to any discussion of the colonial history of Zimbabwe and the liberation war against colonialism. Among the areas the text is silent on is the role of white people in institutionalising racism in the colony and the contributions of ZAPU and the Ndebele during the war of liberation. These silences are informed by a reconciliation agenda which makes silence integral to its realisation.
ABSTRACT
This article demonstrates, through Michael Gascoigne’s *Tunzi the Faithful Shadow* (1988), that literature for children is sometimes employed by the government into the service of propagating dominant state ideologies in Zimbabwean schools. Such texts disseminate issues of inclusion and exclusion that characterise all nation building projects. I argue, through a reading of *Tunzi the Faithful Shadow* that texts for children studied in Zimbabwean schools have been shaped by a distinctly Zimbabwean socio-historical context which includes, but is not limited to, the formation of a new national sensibility after the liberation war and the political unrest in the emerging nation.

*Children’s Literature in Education* Vol 44, Issue 1, pp. 44-56
ABSTRACT
The paper gives a brief history of Kalanga and its place in the Zimbabwean language map. It notes the ironic influence of a ‘minority’ language on a dominant one in the naming of places in Zimbabwe’s Matobo\(^1\) District. The linguistic and onomastic pattern in Matopo\(^2\) is such that there is linguistic and cultural dominance of Kalanga on a predominantly Ndebele speech community. The study investigates why a language designated as minority has such a strong hold in the naming of territorial places falling within the Ndebele people’s sphere of political and cultural influence. Is this an unprecedented reversal of roles where ‘minority’ culture exercises linguistic and cultural hegemony over a dominant one? In explaining this linguistic situation, the paper traces the etymology of the territorial place names in the district under study. It tries to ascertain whose culture and whose values place names should uphold in a given territory. The relevance of Kalanga oral history in the naming of places is investigated and so are the reasons of maintaining a minority culture in a Ndebele speaking community. Some of the questions that model the thesis of this paper are:

Whose culture and whose values are the place names upholding?

Is it forced assimilation or is it a resurgent minority re-asserting itself?

Can a minority language use place names as a conduit for its preservation and maintenance?

The paper concludes by refuting the belief that minority cultures are always subjected to the hegemonic influence of dominant one.

1. Matobo is the name of a district in Matabeleland South Region in Zimbabwe.
2. Matopo is an area in the Matobo District

In the Dyke journal Vol 6 Number 4, 2012
Influence Of An African Language On European Place Names In Zimbabwe: Is It Language Corruption, Language Development Or Resistance?

Raphael Nhongo, Jesta Masuku

ABSTRACT
The main focus of the paper is on the English place names in the southern parts of Zimbabwe that have been transformed or modelled along the phonological, morphological and semantic patterns of the Ndebele language. Most English place names have followed the levels of linguistic analysis of Ndebele which happens to be the dominant language in the Matabeleland region and is accorded an official language status alongside Shona. The paper scrutinizes the term creation strategies in transforming these place names from English to Ndebele from the linguistic and social perspective. Emphasis is put on whether there is a relationship between some social aspects and term creation. As the paper develops the discussions revolves around the following key questions:

- Why are the English names modeled along the linguistic patterns of the Ndebele language?
- What yardsticks are used in coming up with the resultant name?
- Which term creation strategies are used in coming up with the resultant names and what are the implications of such strategies?
- What sort of controversies result in such kind of creation of the place names?
- Are there any effects on the referents when considering the names that were there prior to the European ones?

After the above questions have been answered the paper will then conclude by showing the interplay between socio-cultural, socio-political, socio-economic, socio-linguistic, socio-historic and term creation.

In ICOS 24 Proceedings 2012, DOI: 10.2436/15.8040.01.138
ABSTRACTS
This article examines linguistic hegemony and linguistic exclusion in the Zimbabwean print and broadcasting media. The discussion is based on the fact that the media carry language, operate through language and contribute to language promotion and development. Therefore, this article argues that there is need for a sound and working language policy for the print and broadcasting media in Zimbabwe. The language used in information dissemination, public debates and communication can include or exclude some speech communities in the country. However, the language choices in the media in Zimbabwe demonstrate multi-layered linguistic hegemonies where English is generally the dominant language, while Shona and Ndebele are hegemonic to the other languages in Zimbabwe. This situation is attributed to the fact that the broadcasting media in Zimbabwe are part of the colonial heritage; that there is a lack of a clear and consistent language policy of the media in Zimbabwe, which is reflective of the absence of a comprehensible national language policy; that the domination of the Zimbabwe Broadcasting Corporation leaves no room for meaningful and authentic competing community radio and television stations; that the media in Zimbabwe are business and political organisations; and that the media in Zimbabwe are appendages of the global media system which favour the use of English.

ABSTRACT
This paper examines the compatibility of the development programs which are implemented by the Non-Governmental Organizations’ (NGOs) in the Midlands, Matabeleland and Masvingo provinces of Zimbabwe with the cultural sustainability and sustainable development in these cultural communities. This paper argues for the integration of cultural capital in the developmental projects which are implemented by the NGOs in the provinces of Zimbabwe. This paper is based on the data which was collected from five NGOs and six cultural communities which are the beneficiaries of the NGOs’ development programs. The theoretical underpinnings of this paper are situated in cultural conservatism, a philosophy which valorises the traditional cultural institutions and the organic change of these cultural communities. This study establishes that, the programs implemented by the NGOs in Zimbabwe are predetermined and are detached from the cultures of the communities in which they are implemented. In view of the argument that culture is an important component in development, both as cultural capital and in defining development, this paper concludes that the prescriptive NGOs’ development programs are detrimental to cultural sustainability and sustainable development in Zimbabwe. Therefore, this paper argues that there is need to integrate the cultural capital of the communities in the designing and implementation of the NGOs development programs in Zimbabwe.

In Journal of Sustainable Development; Vol. 5, No. 10; 2012, Toronto: Canadian Centre of Science and Education
ABSTRACT
This chapter critically examines Mugabe’s two speeches. The one he delivered at the United Nations (UN) climate change summit that was held in Copenhagen in 2009 and the other one he delivered at the 2008 Zimbabwean independence celebrations. The chapter argues that not only conversations with explicit participants can be regarded as argumentative (van Eemeren, 2010). Thus, to achieve the purpose, the pragma-dialectic theory of argumentation is employed. The analysis of the speeches show how Mugabe utilised the podium to dialogically interact with the audience, both outside and inside, persuasively inviting them to align with him (speaker) and disalign with the ‘negative’ voices. The analysis also confirms that stance taking and value positioning is a factor in argumentative discourse.

ABSTRACT
The article examines the nature of implicature realised in the election-prediction discourse in the Zimbabwean media. The focus is on how the print and electronic media, through its ‘digestion’ of news (Archakis & Tsakona, 2010), predicted the win or loss of political parties or candidates. The article shows how the media has been shaping public opinion in the run-up to the harmonised elections in Zimbabwe in 2008. In order to achieve this, the researcher employed the Gricean conceptualisation of implicature. It is argued that the cooperative principle and the suggested maxims are not observed during face-to-face conversation only. Taking into account the context of the newspaper, journalists are also expected to observe the cooperative principle and the maxims as they converse with the readers of their newspapers. Thus, the article examines how newspaper reporters try to be cooperative while at the same time aligning readers with a particular ideology and political party. The violation or flouting of the maxims has been observed in the newspaper reports as a strategy to shape public opinion, aligning the readers with a particular winning candidate.
ABSTRACT
In the absence of the international coverage of the Rwandan genocide, most international audiences came to know the Rwandan tragedy through the film, Hotel Rwanda, which was directed by Terry George, and which came out in 2004—ten years after the genocide of 1994. The film is a chilling visual account of how nearly one million Tutsis were massacred by Hutu extremists in the span of nearly 100 days. However, following the “heels” of the production of Hotel Rwanda, Paul Rusesabagina and Tom Zoellner published An ordinary: the true story behind “Hotel Rwanda” (2006) a book that claims to tell the “truth” behind the film. The question then is: How much of what happened in the Rwandan genocide in 1994 was Hotel Rwanda authorized to tell and not to tell? This article does not seek to confirm whether or not what the film depicts correspond point for point with what is in the book. Rather, using Derrida’s concept of “iteration” this article explores the dynamics that exist when a subject or theme narrativized in one form is repeated in another. The article then links iteration, which produces differance in textual meanings to Bakhtin’s idea of the “chronotope” as a place of encounter in genres of popular culture. The article argues that films construct meanings during moments of enunciation and that these meanings can significantly alter the narratives contained in a novel on the same theme. A novel can elaborate what film time may not achieve in a limited time-span, while a film can also offer transgressive meanings through its visual language that words on the page of a novel may not be able to animate.
Song and Political Satire in the Play, *the Honourable MP* (1987)

Urther Rwafa

*Midlands State University*

**ABSTRACT**

Post-independent Zimbabwe, like some other countries in Africa, is a space disfigured by greedy, unfilled promises, corruption and political discontentment. The play, *The Honourable MP* by Gonzo Musengezi subtly captures Zimbabwe’s socio-political environment with its pot-bellied politicians who drain the national coffers, abuse young girls and abandon the electorate only to surface towards election time. *The Honourable MP* (1987) uses the language of political satire and irony embedded in song and dramatic performance to move its story ahead. What this article analyses through song are levels of conceptualizing political greediness and intolerance that the play *The Honourable MP* evokes. To analyse the songs in the play, Bhakhtin’s (1994) theory of carnivalesque and laughter of the market-place are used to poke fun and satirically bite at the spectacle of excessive greed and consumerism of the powerful, and also mock at some reactionary tendencies of the oppressed.

**Key Words** play, political satire, song, Zimbabwe
The Role of Song in Selected Zimbabwean Television Advertisements

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ABSTRACT

Songs are one of the rhetoric devices advertisers’ uses to flatter audiences to buy products, services or ideas they might have not even thought of buying. If the scenes of an advertisement are accompanied by well-suited pieces of songs, they become more effective. While songs in advertisements serve various roles ranging from entertainment, increasing product or service memorability and targeting audiences to structure/continuity in the advertisement itself, this article argues that songs in advertisements also have the potential of constructing and negotiating meaning in specific contexts (Cook 1999:39). These specific contexts range from political to commercial advertising, to mention but two. The ultimate aim of this construction and negotiation of meanings in advertisements through songs is the “establishment of authority” (Huron 1989). When authority is established, an organisation’s products, services or ideas will command superiority over those of competitors. In order to show how songs in an organisation's advertisement asserts authority of products, services or ideas, three Zimbabwean advertisements will be used as instances. Focus will be on the lyrical language of songs, for it is through these lyrics that audiences’ disbeliefs or doubts are overcome and authority established.

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ABSTRACT
The aim of this article is to demonstrate that issues of gender equality are not easily taking root in Zimbabwean society owing to extensive use of patriarchy language. Patriarchy language is referred in this article as that vocabulary which is used in sustaining male dominance over women economically, socially and politically. Thus, patriarchy language helps in ensuring continued position of superiority of men over women. This language is mostly used by men. However, in some instances, women use patriarchy language unconsciously. Patriarchy vocabulary usually portrays women as ‘prostitutes’, ‘loose’, ‘dangerous’ and ‘careers or transmitters’ of HIV/AIDS in Zimbabwean society. The ultimate argument of this article is that the use of patriarchy language is ideological. It is male resistance of the fact that when it comes to issues of HIV/AIDS both male and female are potential ‘players’. Through this language, men portray themselves not as ‘sources’ of the pandemic, but as ‘victims’ of women ‘immoral’ behaviours. In-order to illustrate how patriarchy language is used by male artists to resist the notion that they are potential partners in the transmission of the pandemic, examples will be drawn from poetry, popular songs and advertisements produced in Zimbabwe.

Key Words Patriarchy, Language, Media, Representation, HIV and AIDS, Zimbabwe

Mugabe’s Dilemma: Zimbabwe And Land Reform at Independence and Beyond

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Midlands State University

ABSTRACT
After 90 years of white domination, the promise of independence meant freedom at last for Zimbabweans. Many had lost their land in the interim, lost their sons, lost their livelihoods not even to mention the hopelessness embedded in being colonized. Expectations were high as was the pressure to deliver on the young leader Mugabe, in 1980, at independence. This article seeks to trace and explain the trajectory of the land reform processes in Zimbabwe from independence and beyond. The central thrust of the paper being to explain the diverse difficulties Mugabe and the new government faced. To explain the mammoth tusk the nascent democracy had, the researcher carried out interviews with people who fought in the liberation struggle (Second Chimurenga), ordinary citizens as well as farmers in different parts of Zimbabwe.

Key Words dilemma, independence, colonisation, democracy, national cake

Gendering the African National Projects in the 21st Century

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ABSTRACT
Contrary to earlier assertions by some among scholars of nationalism that in the age of globalisation nationalism was waning, the 21st century has in fact witnessed vigorous re-assertions of nationalisms and the relevance of gender analyses of nationalist projects. This chapter takes as its point of departure the implicatedness of nationalism in the power balance between men and women and that nationalisms are sites of gender struggles. Given the perceived increasing agency of women in the global age, the chapter pursues the question of the gender of national agency in the 21st century and whether the symbolic relation of genders to the nation will remain located at the cusp of the patriarchal nature of nationalism and the historical construction of gender differences. The chapter problematises the nature of the contested systems of cultural representations that sustain, legitimise or delegitimise men’s and especially women’s access to state power and national resources. Following the gaining of theoretical currency of gender performativity in feminist philosophy, this chapter also examines the ways in which men and women perform gendered roles and negotiate their places in the national imaginary. Performativity will provide a framework for apprehending the cultural and political power of women in nationalist projects. Since all nationalisms are inventions, it is also the scope of this chapter to interrogate in turn the invention of feminine iconography and its deployment in nationalist politics. The chapter will raise questions regarding the increasing economic gap between classes of women, a legacy of globalisation, and how class politics and gender politics intersect in nationalisms. This ultimately ironises gender and nationalism.

Key Words: gendering, national project, women, globalisation, gender ironies iconography

ABSTRACT
The way states and development specialists rationalize how to commit economic resources to development is influenced, to a greater extent by their level of persuasion towards specific development theories. The discourse assesses the influence of modernization and dependency theories on Africa’s development. The conclusion is that both theories have failed to help develop Africa. The discourse pins hope on the African Renaissance theory of development.

Key Words: Modernization, dependency, rural underdevelopment, African renaissance.

African Journal of History & Culture, 3(5)65–72. The article is on the reading list of universities in Africa and the UK
Focusing on Psycho-Social Effects of the May 2008 Xenophobic Attacks in South Africa

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Midlands State University

ABSTRACT
Xenophobia is a latent or obtrusive dislike of foreigners. It is anti-social and destructive of property and life. Xenophobic attacks in South Africa, which started around mid-May in 2008 in the informal settlements of Alexandria claimed 62 lives. Thousands of foreigners were left homeless. What triggered the xenophobic attacks on foreigners? Better still, what can be done to stop xenophobia and xenophobic attacks in South Africa? This desktop research provides responses to these questions.

Key words: Xenophobia, xenophobic attack, May 2008, South Africa

Feature Conditioned Resolution of Hiatus In Chichewa

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ABSTRACT
This article examines the morphophonological environments in which vowel sequences occur in Chichewa and explains the synchronic hiatus resolution strategies that are employed in this language to remove these dispreferred vowel cluster configurations. This investigation demonstrates that the major motivation for resolving hiatal configurations in Chichewa, like in many other Bantu languages, is to maintain the preferred canonical consonant-vowel (CV) syllable structure. The analysis of data used in this study is mainly couched within the theoretical explications of Optimality Theory (OT) as enunciated by Prince and Smolensky (1991, 1993), McCarthy and Prince (1999), Archaengeli and Langendoen (1997), and Kager (1999); Distinctive Feature Theory as discussed by Chomsky and Halle (1968) as well as the generative CV-phonology model of syllable structure as discussed by Clements and Keyser (1983). This article argues for vowel-feature sensitive repair of hiatal configuration in Chichewa. Observing such a vowel-feature sensitive based repair of hiatal configuration analysis, which this article argues to be largely ONSET motivated/triggered and the featural properties of the phonological structures of the language under study, the language’s reactions to such dispreferred vowel clusters and its phonotactics are here examined. Repair strategies for such hiatus configurations are discussed, including glide formation, consonantal and/or glide insertions, vowel deletion and coalescence. The analysis adopted here implies that the resolution hiatus arises from incompatibilities in the features of the vowels straddling a word boundary. It argues that these repair strategies are largely motivated by language internal constraint ranking systems which in many Bantu languages seem to largely prefer the preservation of [−] features over [+] features, i.e. the ranking [−F’]≫[+F’].

Evaluating Authorial ‘Objectivity’ and ‘Stancetaking’ in Reporting the Making of a New Constitution in Zimbabwean Newspapers

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ABSTRACT
Zimbabwe held ‘fresh’ elections on July 31, 2013 under a new constitution. This was in line with the provisions of the Global Political Agreement (GPA), a political power-sharing compromise signed between Zimbabwe’s three main political parties, following the heavily disputed 2008 harmonised presidential and parliamentary elections. The GPA established in Zimbabwe a Government of National Unity (GNU). On the road to making a new constitution, political differences and party politicking always seemed to take precedence over national interest. This political polarity in Zimbabwe resulted in the heavy polarity of the media, especially along political ideological grounds. The new constitution-making process and all its problems received heavy coverage in almost all national newspapers. This article analyses the discourse-linguistic notion of ‘objectivity’ in ‘hard’ news reports on the new constitution-making process by comparing the textuality of ‘hard’ news reports from two Zimbabwean national daily newspapers: the government-owned and controlled Herald and the privately owned Newsday. Focusing on how language and linguistic resources are used evaluatively in ways that betray authorial attitudes and bias in news reporting, the article examines how the news reports uphold or flout the ‘objectivity’ ideal as explicated through the ‘reporter voice’ configuration, and within Appraisal Theory.

Key Words: Appraisal Theory, constitution, elections, ‘hard’ news, objectivity, Zimbabwe
ABSTRACT
Proper hyperinflation detection is a clear prerequisite for effective contracting and corporate governance modelling if stakeholder value is to be preserved even in deflated terms. This paper examines how inflation, linked to other macroeconomic variables, such as interest or currency rates, can affect the company’s operating margins and cash flows, so modifying the equilibriums among different stakeholders. The paper will also demonstrate that inflation may not always be a zero sum game, with compensating winners and losers. Literature review will show that inflation has a deep impact on operating leverage and cash flows, affecting, with its volatility, the risky cost of collected capital. Inflation risk stands out as a powerful, albeit often unperceived, stakeholder wealth redistributors. The impact of inflation on economic margins and financial flows, which represent the company’s strategic key parameters, is originally presented in an intuitive way with the conclusion that inflation and corporate governance are considered linked issues. Recommendations are proffered in that prompt monitoring and resilient contractual design ease inflation risk detection and mitigation, together with proper and flexible financial modelling.

Key Words: Corporate Governance, Hyperinflation, Stakeholder value, Operating margins, Wealth redistributors, Economic margins, financial flows
ABSTRACT
The government of Zimbabwe adopted a multiple currency regime in January 2009 after a decade of economic decline. The new regime brought with it benefits to the economy and helped restart financial intermediation. Despite these benefits, many banks are facing challenges of liquidity risk. This paper empirically investigates the determinants of Zimbabwean commercial banks liquidity risk after the country adopted the use of multiple currencies exchange rate system. To do so, panel data regression analysis is used on monthly data from March 2009 to December 2012. From the panel data regression results, capital adequacy and size have negative significant influence on liquidity risk. As size increases, liquidity risk reduces. Spreads have positive influence on liquidity risk. Non-performing loans have a positive significant relationship with liquidity risk. Reserve requirement ratios and inflation were also significant in explaining liquidity risk during the studied period. For commercial banks to manage liquidity risk there is need to pay attention to bank capitalisation, the size of the bank and on the differences between the deposit rates and lending rates. There is also need for improved credit risk analysis if banks are to have good financial assets in the dollarised environment.

Zimbabwe Commercial Banks Liquidity Management In The Hyperinflation Environment

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ABSTRACT
The paper investigated liquidity management by commercial banks when there was hyperinflation. The main enquiry of this study was to understand how Zimbabwe commercial banks managed liquidity risk in a hyperinflationary environment. To achieve this, information was obtained from primary sources with data collected from decision makers of fifteen commercial banks which met the criteria of full scale operation from 2000 -2009. To compliment this, secondary data sources were used. Focal areas of the study were to analyse years of bank business; ownership; liquidity risk management responsibility; products offered by commercial banks; major sources of funds and applications; internal and external liquid instruments to manage liquidity risk; impact of inflation on liquidity risk management; and the effect the Reserve Bank of Zimbabwe instruments introduced to fight inflation. The findings show that liquidity risk management during the hyperinflation was a challenge. The Instruments used by the Reserve Bank of Zimbabwe to fight inflation had negative effect on commercial banks asset and liability management. In line with this, the monetary authorities were recommended to put in place measures which took into consideration the impact of their policies on bank liquidity risk management when there are problems of high inflation. The study also recommends commercial banks to take proactive management measures and long term views to operations beyond the challenges posed by inflation. In the process banks, would create new demand for the products.

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ABSTRACT
We examine the impact of the economic reform programme on the financing choices of Zimbabwean listed companies. Using the published accounts of a sample of companies we show that listed firms rely heavily on external finance, especially short term bank financing. We estimate an eclectic econometric model of firms’ capital structure based on key predictions from the theory of finance, augmented by variables aimed at capturing the impact of Zimbabwe’s reform programme. The analysis shows that an orthodox model has little explanatory power over firms’ capital structure in the pre-reform period, but in the post-reform period it does better. The differences between the pre-reform and post-reform era suggest that the reforms achieved partial success in opening up the capital markets and improving the transparency of firm financing behaviour.

Correlates of Multiple Sexual Partnerships among Formerly Married Men In Zimbabwe

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Midlands State University

ABSTRACT
The main purpose of this study was to determine socio-economic factors associated with multiple sexual partnerships among formerly married men aged 15-54 years in Zimbabwe. This is an analytical cross-sectional study, based on secondary data drawn from the 2005-2006 Zimbabwe Demographic and Health Survey (ZDHS) and 353 formerly married men were included in this study. The outcome variable used in this study was derived from data collected on the number of sex partners in the past twelve months prior to the survey. This variable was used as a proxy for multiple sexual partnerships. The independent variables were selected from demographic, socio-economic and sexual behaviour factors hypothesized to be associated with multiple sexual partnerships. A Negative Binomial regression model was estimated to determine correlates of multiple sexual partnerships and age, geographical region, being away from home for at least a month and access to newspapers and magazines were found to be significantly associated with multiple sexual partnerships among formerly married men in Zimbabwe.

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327. Military Spending in Zimbabwe

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Midlands State University

ABSTRACT
This article studies influences on and identifies various types of extra-budgetary and hidden channels of funding military activities in Zimbabwe. The aim is to obtain insight into the military budgeting process and to explore institutionalized means for controlling, monitoring, and auditing the country’s military expenditure.

Key Words: military spending, military budgeting, Zimbabwe

The Impact of Financial Liberalisation and Savings Mobilisation in Zimbabwe

Zachary Tambudzai
Midlands State University

ABSTRACT
The impact of financial variables on savings mobilisation is the main bone of contention. The relationship between financial liberalisation and financial repression theory to savings mobilisation is empirically tested. The main approach employed is the modelling procedure suggested by Engle and Granger (1987). The regression results suggest that financial variables do matter in the process of savings mobilisation. From the empirical analysis financial liberalisation had significant impact on the accumulation of savings in Zimbabwe. Therefore, policy-makers can promote savings mobilisation by designing policies that impact positively on the financial sector's development.

Key Words: financial liberalisation, savings mobilisation, financial sector, error correction model

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Faculty of Natural Resources and Agricultures

329. An Overview of Current Agronomic Practices of Smallholder Farmers in Semi-Arid Central and Western Zimbabwe

V. MAKUVARO

Midlands State University

ABSTRACT
Smallholder farmer productivity in developing countries is limited by diverse biophysical, political and socio-economic factors. The objective of this study was to establish current agronomic practices of smallholder farmers in semi-arid Lower Gweru and Lupane areas of Zimbabwe and to identify possible research and extension interventions that may improve crop productivity of these farmers. Focus group discussions, interviews and desktop study were used to collect data. Horticultural production is the main livelihood in Lower Gweru, while field crop and livestock production are livelihoods in both areas. Conventional tillage is the predominant tillage system. Important crops include maize (Zea mays L.), pearl millet (Pennisetum glaucum (L) R.Br.), sorghum (Sorghum bicolor L.) and groundnuts (Arachis hypogea L.). Farmers grow both hybrid and open-pollinated maize varieties (OPVs) with more farmers in Lupane than in Lower Gweru, growing these OPVs. The number of farmers growing improved varieties of small-grain crops has increased, since mid 1990s. The method and frequency of weeding depends on tillage system used and availability of equipment as well as draft power. Adoption rates for technologies such as water conservation and use of adequate soil ameliorants as well as effective crop rotations are due to limited resources. The study identified some research and extension interventions that may be employed to improve crop productivity in semi-arid areas of Central and Western Zimbabwe.

Key Words: Smallholder farmers, agronomic practices, semi-arid areas, research and extension interventions.

Barriers to Effective Learning by University Students on Work-Related Learning: A Case Study of Students on Work Related Learning in Gweru Urban Area of Zimbabwe

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ABSTRACT

Work Related Learning (WRL) provides a platform for students to link theory and practice. Universities in Zimbabwe have WRL as part of their curricula and whilst some universities refer this programme to as "student attachment", others have adopted the term WRL. The period of student placement at work places may differ among universities. There has however, been a general move from short term periods to longer periods of attachment. When effectively carried out, WRL can benefit students, academic staff / institutions as well as the employer. The aim of this study was to identify barriers to effective learning of students on WRL. A case study was conducted with students on WRL in Gweru urban area. A questionnaire was administered to 50 students who were at 15 different workplaces during the period May-June 2014. Semi-structured interviews were also conducted with a total of eight co-ordinators of the WRL programme sat the Midlands State University in Gweru and supervisors at 12 randomly selected workplaces where students were seconded for the WRL programme. Problems encountered by students on WRL include delays in securing places for attachment, lack of financial incentives to meet basic requirements and limited access to Information Technology and Communication. The study recommends that Universities revisit their WRL programmes to address existing conditions, particularly those of large student numbers and a dwindling industrial base, that are rendering WRL less effective. Policies which permit effective placement and learning of students on WRL at both private and public work-places should also be put in place.

Key Words: Work related learning, students, barriers, revisiting of WRL programmes.

Faculty of Science and Technology

331. An update on the ecological distribution of the Ixodidae ticks in Zimbabwe.

Marvelous Sungirai, Maxime Madder, Doreen Zandile Moyo, Patrick De Clercq, Emmanuel Nji Abatih

Midlands State University

ABSTRACT

Seven thousand six hundred and fifty seven ticks were collected from 121 dip tanks in 12 districts representative of Zimbabwe’s five ecological regions between September 2013 and May 2014. Based on morphological traits four genera and 13 species of ticks were identified. Amblyomma hebraeum (60.3%), Rhipicephalus microplus (58.7%), Rhipicephalus decoloratus (47.1%), Rhipicephalus appendiculatus (56.2%), Rhipicephalus evertsi evertsi (67.8%), Rhipicephalus (near) punctatus (13.2%), Hyalomma truncatum (38%) and Hyalomma rufipes (46.3%) were found in all the ecological regions of the country. Amblyomma variegatum and Rhipicephalus compositus (0.8%) were only found in the north central part of the country while Rhipicephalus simus (5%) had a sparse distribution. The Haemaphysalis leachi group (1.7%) and Rhipicephalus sanguineus (1.7%) were found whenever dogs were sampled suggesting these could be widespread throughout the country. The study confirmed the continued limited distribution of Amblyomma variegatum (3.3%) in the north central parts of the country, whereas A. hebraeum was found to have a wide distribution also encroaching areas of high rainfall and lower temperatures where it was not previously recorded. A parapatric relationship existed between these two Amblyomma species. Rhipicephalus appendiculatus was also widely distributed although its presence was dominant in the cooler and wetter parts of the country. The traditionally held view that Hyalomma species and R. evertsi evertsi can survive well under diverse conditions is upheld in this study. Rhipicephalus microplus was also present in dry regions but its adaptability to these regions requires further investigation.

The Effect Of Treatment With A 1% Injectable Formulation Of Moxidectin During The Rainy Season And At The Beginning Of The Dry Season On Gastrointestinal Nematodes In Cattle From Communal Areas In Zimbabwe


Midlands State University

ABSTRACT

The effect of 1% moxidectin/cydectin at 0.2 mg/kg live weight on gastrointestinal nematodes and on the growth of calves, weaners and cows was investigated in five communal areas on the highveld of Zimbabwe. Three field experiments were carried out between March 1996 and June 1997. In experiment 1, treatment was administered in all five areas at the end of the rainy season in March 1996, followed by a further treatment at the beginning of the dry season in May/June 1996. In experiment 2, the treatment was administered in three areas at the end of the rainy season in March 1997. In experiment 3, treatment was administered in one area at the beginning of the dry season in April 1997. Large numbers of eggs were present in the faeces of calves and weaners at the start of experiments 1 and 2. Epg values were lower in cows and in all age categories in experiment 3. There was a statistically significant reduction in epg values in calves, weaners and cows following treatment with a reduction of 90–99% in all cases except in cows in experiment 3, where no meaningful assessment was possible owing to the low egg counts in both the treated and control cows. The dominating larval types in faecal cultures were Cooperia and Haemonchus. Trichostrongylus, Oesophagostomum and Bunostomum were also found. Following treatment, Haemonchus was suppressed far more than Cooperia. This may be related to a longer residual effect against abomasal parasites like Haemonchus in comparison to small intestinal worms like Cooperia. Anthelmintic treatment conferred significant weight gain advantages (p<0.05) on treated calves, weaners and cows. The weight gains are discussed in relation to disease and nutritions.
ABSTRACT
In this work, we focused on the analysis of implantation-induced defects, mainly small interstitial clusters (ICs) and {311} defects introduced in n-type Si after ion implantation using deep level transient spectroscopy (DLTS). Silicon ions (at 160 keV or 190 keV) of fluences ranging from (0.1–8.0) × 10^{13} cm^{-2} have been implanted into n-type Si and annealed at temperatures between 500°C and 800°C specifically to create small ICs or {311}’s rod-like defects. In samples dominated by small ICs, DLTS spectra show prominent deep levels at \( E_C - 0.24 \) eV and \( E_C - 0.54 \) eV. After increasing the fluence and temperature, i.e., reducing the number of small ICs and forming {311} defects, the peak \( E_C - 0.54 \) eV is still dominant while other electron traps \( E_C - 0.26 \) eV and \( E_C - 0.46 \) eV are introduced. There were no observable deep levels in reference, non-implanted samples. The identity and origin of all these traps are interpreted in conjunction with recently developed predictive defect simulation models.

*Journal of Applied Physics, Volume: 113, Year: (2013), Page No.: 184508*
Analysis of Temperature Dependent I-V Measurements on Pd/ZnO Schottky Barrier Diodes and the Determination of the Richardson Constant

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ABSTRACT

Temperature dependent current–voltage (I-V) and Hall measurements were performed on Pd/ZnO Schottky barrier diodes in the range 20–300K. The apparent Richardson constant was found to be $8.60 \times 10^{-9} \text{ AK}^{-2}\text{cm}^2$ in the 60–160K temperature range, and mean barrier height of 0.50 eV in the 180 – 300K temperature range. After barrier height in homogeneities correction, the Richardson constant and the mean barrier height were obtained as $167 \text{ AK}^{-2}\text{cm}^2$ and 0.61eV in the temperature range 80–180K, respectively. A defect level with energy at 0.12 eV below the conduction band was observed using the saturation current plot and $(0.11 \pm 0.01)$ eV using deep level transient spectroscopy measurements.

Physica B: Condensed Matter, Volume: 404, Year :(2009), Page No.:1092

A NECHIBVUTE
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ABSTRACT
The recent advances in ultralow power device integration, communication electronics, and microelectromechanical systems (MEMS) technology have fuelled the emerging technology of wireless sensor networks (WSNs). The spatial distributed nature of WSNs often requires that batteries power the individual sensor nodes. One of the major limitations on performance and lifetime of WSNs is the limited capacity of these finite power sources, which must be manually replaced when they are depleted. Moreover, the embedded nature of some of the sensors and hazardous sensing environment make battery replacement very difficult and costly. The process of harnessing and converting ambient energy sources into usable electrical energy is called energy harvesting. Energy harvesting raises the possibility of self-powered systems which are ubiquitous and truly autonomous, and without human intervention for energy replenishment. Among the ambient energy sources such as solar energy, heat, and wind, mechanical vibrations are an attractive ambient source mainly because they are widely available and are ideal for the use of piezoelectric materials, which have the ability to convert mechanical strain energy into electrical energy. This paper presents a concise review of piezoelectric micro generators and Nano generators as a renewable energy resource to power wireless sensors.

http://dx.doi.org/10.1155/2012/853481
Finite Element Modelling Of a Piezoelectric Composite Beam and Comparative Performance Study of Piezoelectric Materials for Voltage Generation

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ABSTRACT
A comparative study of the traditional PZT ceramics and new single crystals is critical in selecting the best material and optimization of transducer design for applications such as conversion of ambient vibrations into useful electrical energy. However, due to material and fabrication costs and the need for rapid prototyping while optimizing transducer design, primary comparisons can be based on simulation. In this paper, the COMSOL Multiphysics finite element package was used to study the direct piezoelectric effect when an external load is applied at the free end of a piezoelectric composite beam. The primary output parameters such as electric potential and electric field were studied as a function of the input strain and stress. The modelling is presented for the relatively new single crystal lead magnesium niobate-lead titanate (PMN32) and three different lead zirconate titanate ceramics (PZT-5A, PZT-5H, and PZT-4). Material performance was assessed by using a common geometry and identical excitation conditions for the different piezoelectric materials. For each material, there are three analyses performed, namely, static, eigenfrequency, and transient/time-dependent analysis. Comparative results clearly suggest that the new crystal material PMN32 is capable of outperforming presently using piezoelectric ceramics for voltage generation.

ISRN Materials Science Journal, Volume 2012, Article ID 921361, 11 pages
doi:10.5402/2012/921361
Evaluation of Anti-Microbial, Anti-Inflammatory and Anti-Oxidative Properties
Artemisia Afra, Gunnera Perpensa and Eucomis Autumnalis

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ABSTRACT

Antimicrobial, anti-inflammatory and free radical scavenging activities of crude root extract fractions from Artemisia afra, Gunnera perpensa and Eucomis autumnalis were determined. Minimum inhibitory concentration was determined by using micro-dilution method. In order to assess antioxidant scavenging capacity of plant extracts and fractions, 2, 2-di (4-tert-octylphenyl)-1-picrylhydrazyl and 2, 2´-azinobis (3-ethylbenzothiazoline)-6-sulfonic was used as substrate. Anti-inflammatory activity of the plant extracts against 15-soybean lipoygenase enzyme was evaluated by measuring change in absorbance at 234 nm using linoleic acid as substrate. The highest activity was obtained from methanol fraction of Gunnera perpensa with EC50 value of 1.069 µg/ml against 2, 2-di (4-tert-octylphenyl)-1-picrylhydrazyl. Eucomis autumnalis crude and acetone fraction displayed DPPH* free radical scavenging activity of EC50 of 2.891 µg/ml and 2.41 µg/ml respectively. Artemisia afra crude fraction and fractions of acetone and methanol displayed activity (EC50 with DPPH* radical were 2.113 µg/ml for crude, 4.393 µg/ml for acetone fraction, 4.715 µg/ml for methanol fraction and with ABTS** radical cation, 6.447 µg/ml and 6.208 µg/ml from crude and methanol fraction respectively). The antioxidant properties of the extracts increased with the polarity of the fractions. Gunnera perpensa crude extract and fractions displayed antimicrobial properties with the methanol fraction being the most active with an EC50 of 80 µg/ml against Pseudomonas aeruginosa and EC50 of 160 µg/ml against Candida albicans. Artemisia afra acetone and methanol fractions displayed inhibitory activities of 20 µg/ml against Escherichia coli and good-moderate activity ranging 160-320 µg/ml for the crude extract. Eucomis autumnalis had activities ranging 160-320 µg/ml by the crude extract and fractions against the organisms tested except for crude extract activity against Escherichia coli of 630 µg/ml. The activities validate claims by the traditional healers use for cure offering possible alternative as dietary supplements to the management of inflammation related conditions.

Journal of Nutrition and Food Science, 2014, Vol 4(pp. 1-6) impact factor 1.14

ABSTRACT

The antimicrobial, anti-inflammatory and free radical scavenging activities of root crude acetone extracts and fractions of different polarities from *Pomaria sandersonii* (Fabaceae), *Pentanisia prunelloides* (Rubiaceae) and *Alepidea amatymbica* (Apiaceae) were determined using in vitro assays. The antioxidant properties of extracts and fractions were assessed by reduction of 2, 2′-azinobis (3-ethylbenzothiazoline)-6-sulfonic acid and 2, 2-di (4-tert-octylphenyl)-1-picrylhydrazyl radicals which was measured by changes in absorbance using a UV-VIS spectrophotometer. Anti-inflammatory activity of the plant extracts against 15-soybean lipoxygenase enzyme was measured by monitoring the change in absorbance at 234 nm after incubation of 15-LOX with linoleic acid (134 µM) as substrate. The anti-microbial activities were determined by measuring the minimum inhibitory concentrations using a serial dilution microplate method with terazolium violet as a growth indicator. The MIC value of the DCM and ethyl acetate fractions (1 mg/ml) of *P. sandersonii* was 80 µg/ml in each case against *Staphylococcus aureus*, and *Escherichia coli*. The inhibition activity of 15-soybean lipoxygenase enzyme by the crude extracts at concentration of 25 µg/ml was 97% for *P. sandersonii*, 79% for *P. prunelloides* and 55% for *A. amatymbica*. This indicates that extracts for these plants can be used as dietary supplements in the management of inflammation related conditions.

**Key Words:** extract, fraction, anti-inflammatory, antibacterial, anti-oxidant, antifungal, antioxidant.
ABSTRACT

Rapid industrialisation is contributing to water pollution. There is a need to identify cheaper and efficient methods of removing contaminants as the demand for clean water rises. A study is carried out to investigate the extraction of alum from locally abundant kaolin clays using sulphuric acid. Alum is a coagulant that is used for raw water treatment. The kaolin clay and alum were characterized by Fourier transformation infrared spectroscopy (FTIR). The effects of particle size, calcination temperature, calcination time, acid-kaolin clay ratio, acid concentration, leaching temperature, and leaching time on extraction efficiency were investigated. The optimum leaching conditions for the calcined kaolin clay were found to be particle size 100 \( \mu \text{m} \), acid-kaolin clay weight ratio 6 : 1, acid concentration 4 M, leaching temperature 100\(^\circ\)C, and leaching time 90 min. Under optimised conditions, 66.95% (w/w) aluminum sulphate was extracted. The results showed that sulphuric acid could be used on a large scale to extract alum from kaolin clay. The extracted alum showed similar structural and physical characteristics compared with commercial alum. A dosage of 40 mg/L of the extracted alum showed effective coagulant properties with a great potential of treating raw water.

*Journal of Chemistry, 2015, 1-7*
Synthesis of Fatliquor from Bovine for Use in Small Scale Leather, Industry,

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ABSTRACT
In this study, fatliquor has been synthesised from waste bovine fat for its use in small scale leather industry. The physico-chemical properties of bovine fat are determined before sulphation with sulphuric acid followed by subsequent neutralisation with ammonia. The degree of sulphation is found to be 90% and the surface active groups of the fatliquor are observed in anionic form. The fatliquor has been applied onto light leather and physical tests are carried out on the fixed leathers. The results of the physical tests on fixed leather conform on standard leather specifications. It is observed that the synthesised fat liquor could be used as an alternative in leather fixation.

Indian Journal of Chemical Technology, 20, 2013, 116-120.
341. Synthesis and Characterization of Electrocatalytic Conjugates of Tetraamino Cobalt (II) Phthalocyanine and Single Wall Carbon Nanotubes

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ABSTRACT
In this paper we report on the synthesis and characterization of electrocatalytic conjugates of tetraamino cobalt (II) phthalocyanine and single walled carbon nanotubes (CoTAPc – SWCNT-linked) for use as electrode surface modifiers. FTIR, UV-Vis and Raman spectroscopies were used to ascertain the chemical linkage between CoTAPc and SWCNT whilst cyclic voltammetry and rotating disc electrode voltammetry were used to assess the electrocatalytic efficiency of the linked product towards the oxidation of 2-mercaptoethanol. The CoTAPc–SWCNT-linked-GCE demonstrated very good catalytic efficiency relative to CoTAPc-SWCNT-mixed-GCE, CoTAPc-GCE and f-SWCNTs-GCE (functionalised-SWCNT). CoTAPc–SWCNT-linked-GCE gave a sensitivity of 0.2 µA/µM and a limit of detection (L.O.D) of $1.2 \times 10^{-7}$ M for 2-mercapto ethanol (2-ME) at pH 4.

Electrochimica Acta (year 2014)
ABSTRACT
FeTAPc single walled carbon nanotube (SWCNT) dendrimers are employed as glassy carbon electrode modifiers for the electrocatalytic oxidations of amitrole and diuron. The catalytic rate constants were $4.55 \times 10^3 \text{ M}^{-1}\text{s}^{-1}$ and $1.79 \times 10^4 \text{ M}^{-1}\text{s}^{-1}$ for amitrole and diuron respectively using chronoamperometric studies. The diffusion constants were found to be $1.52 \times 10^{-4} \text{ cm}^2\text{s}^{-1}$ and $1.91 \times 10^{-4} \text{ cm}^2\text{s}^{-1}$ for diuron and amitrole respectively. The linear concentration range for both were from $5.0 \times 10^{-5}$ to $1.0 \times 10^{-4}$ M and sensitivities of 0.6603 $\mu\text{A/µM}$ and 0.6641 $\mu\text{A/µM}$ for amitrole and diuron, with corresponding limits of detection of $2.15 \times 10^{-7}$ M and $2.6 \times 10^{-7}$ M using the 3$\delta$ notation respectively.

Journal Name: Electrochimica Acta (year 2014)
Concomitant Metal Organic Frameworks of Cobalt (II) and 3- (4Pyridyl) Benzoate: Optimized Synthetic Conditions Of Solvatochromic and Thermochromic Systems

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ABSTRACT

Two coordination networks, {[Co(34pba)2]·DMF}n (1 and 2), where 34pba is 3-(4-pyridyl)benzoate, were prepared by solvothermal methods. 1 is a three-dimensional metal organic framework formed by linking \( \text{[Co}_2(34\text{pba})_8] \) clusters in a bcu net. 2 consists of single \( \text{[Co}(34\text{pba})_4] \) units in a tetragonal plane net of sql topology. The thermal conditions leading to their selective synthesis were established: 120 °C for 1 and 75 °C for 2. Their structures were solved and their thermal behavior was investigated. Further experiments established the activation energy for the desorption of the DMF molecules entrapped in their framework: 76(6)−106(16) kJ mol−1 for 1 and 49(3)−58(3) kJ mol−1 for 2. For 1, sorption experiments were carried out to demonstrate the ability of the coordination network to absorb different solvents, and the framework solvatochromic response was also ascertained.

A New Class of Thermo- And Solvatochromic Metal–Organic Frameworks Based On 4-(Pyridin-4-Yl) Benzoic Acid

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ABSTRACT
Using 4-(pyridin-4-yl)benzoic acid, 44pba (1) as a ligand, two new metal-coordination networks [Co₄(44pba)₈]ₙ·[(DMF)₃·(EtOH)₀.₂₅·(H₂O)₄]ₙ (2) and [Ni₄(44pba)₈]ₙ·[(DMF)₃·(EtOH)·(H₂O)₁.₅]ₙ (3) were synthesized by solvothermal methods and structurally characterized. Compounds 2 and 3 are isostructural but differ in their solvent content. Each is a 2D-network which forms a spiral parallel to [001], giving rise to three distinct large channels, accounting for some 47% of the unit cell volume. Both 2 and 3 display water-induced phase transformations with chromatropism, which has been confirmed by TGA and XRPD analysis. Solvatochromism in 2 is also evident with crystals exhibiting a range of colours depending on the solvent included. This phenomenon has been characterized using TGA, XRPD and UV-vis spectrophotometry.

High Population Connectivity And Pleistocene Range Expansion In The Direct-Developing Plough Shell *Bulliarhodostoma* Along The South African Coast

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*Midlands State University*

**ABSTRACT**

Pleistocene climatic and oceanographic changes have influenced the distribution of marine biodiversity in southern Africa. Most evidence, however, has been derived from rocky shore or demersal taxa; data on sandy shore species are limited, despite severe threats to many sandy beach ecosystems. To test the effects of past climatic changes on sandy shore species, we sampled 140 smooth plough shell *Bulliarhodostoma* individuals from eight localities and generated phylogeographic data derived from the mtDNA cytochrome *c* oxidase subunit 1 (COI) marker. Nuclear markers (ATPSα, ATPSβ, ANT, SRPS4, TBP, LTRS and ZMP) showed no sequence variation. *Bulliarhodostoma* exhibited shallow genetic differentiation (*Φ* < 0.07, *p* < 0.05) across its range. Isolation-by-distance suggests a stepping-stone model of migration, which is expected given the species’ direct-development life-history strategy. Demographic reconstruction suggests a post-LGM (Last Glacial Maximum) range expansion, concordant with the signal of shallow genetic differentiation. Phylogeographic patterns obtained suggest that, during lower sea levels than current, *B. rhodostoma* could have been restricted to the South-West Coast, the central Agulhas Bioregion and probably also the East Coast. When climatic conditions changed and temperatures began to rise after the LGM, the species began a rapid westward range expansion from these refugial regions.

**Key Words:** cytochrome oxidase, demographic history, Pleistocene climatic changes, structure, sandy beach, ecosystems, sea level

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346. The Impact Of Fish And Drought On Frog Breeding In Temporary Waters In Zimbabwe

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ABSTRACT

The breeding of frogs in four ponds near Harare, Zimbabwe, was investigated during a wet rainy season (2000/01) and a dry one (2001/02). During 2000/01 eight and nine species bred in two ponds in abandoned gravel pits that never contained fish, but only four species bred in these in 2001/02 and the relative abundance was reduced by about 50%. Pond 3 was a small dam that filled after the rains and was invaded by fish once it overflowed. Five species bred in it in 2000/01, but breeding activity was curtailed once it was invaded by catfish, Clariasgariepinus, some of which were found with frog remains in their stomachs. The pond did not overflow in the following season, and was therefore not invaded by fish; although only four species bred in it their relative abundance was considerably higher. Pond 4 was a permanent pond that always contained fish. Only three species bred in it and the relative abundance of tadpoles was always low. Species belonging to the Ranidae seemed to be most severely affected by drought and this may explain the absence of some species, such as the African bullfrog, Pyxicephalusadspersus, that was once abundant around Harare.

Key Words: frog breeding, predation, drought, Zimbabwe


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“When In Joburg Relatives Show Their True Colours”: The Changing Role of the Family as a Source of Social Capital among Zimbabwean Migrants in Johannesburg

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ABSTRACT
This study analyses the changing role of the family as a source of social capital in aiding migration, settlement and social integration of Zimbabwean migrants. The study is based on qualitative interviews with 58 Zimbabwean migrants in Tembisa and Kempton Park in Johannesburg metropolitan city. The article makes an important contribution to literature revealing how as a result of decreased chances to get a good job, pressure to remit back home and expectations to look after newcomers, Zimbabwean migrant families are experiencing economic strain resulting in tense and hostile relations and rejection of new migrants.

Key Words: Family, hostility, migrants, opportunity structure, Social capital

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The Uses of Social Capital among Zimbabwean Migrants in Johannesburg

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ABSTRACT

This paper analyses the role of family and church networks as sources of social capital in aiding migration, settlement and social integration of Zimbabwean migrants. It also shows how these networks sometimes inhibit migrant integration into the host community. The study was carried out among Zimbabwean migrants in Tembisa and Kempton Park in Johannesburg. This study adds to the growing literature on bonding and bridging social capital while at the same time revealing how social capital is both a blessing and blight to Zimbabwean migrants. This paper makes an important contribution to the literature by arguing that while sometimes migrant social integration is hindered by the activities of the host population (e.g. xenophobic attitudes among South African locals), in some cases, the migrants themselves could hinder their own social integration through their migrant social networks. I argue that this is an unintended consequence of migrant family and religious networks.

Rate of Land-Use/ Land-Cover Changes in Shurugwi District, Zimbabwe: Drivers for Change.

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ABSTRACT
Shurugwi district lies around the mineral-rich geological formation commonly referred to as the Great Dyke. The formation also has fertile soils ideal for agriculture. The district has been experiencing a lot of land-use and land-cover changes induced both by the people and machinery in recent years following the Government's Fast-Track Land Reform and Resettlement Program and the exploitation of different minerals, including gold and platinum. This study sought to determine the rate of land-cover change that has occurred in Shurugwi district since 1990. This was achieved through the use of Geographic Information Systems (GIS) and remote sensing techniques. The study also attempted to establish the factors contributing to land-use and land-cover changes and this was achieved through semi-structured interviews with key respondents. Field observations and measurements were also employed to validate results from remotely sensed data. Results show that the rate of land-cover and land-use change has been significant in Shurugwi district and that the greatest change occurred in 2000-2009. This accelerated change is mainly attributable to cultivation (and related activities) linked to the Fast-Track Land Reform and Resettlement Program, as well as mining and gold panning activities. The study recommends that the Environmental Management Agency (EMA) monitor the cutting down of trees in newly resettled areas through the promotion of tree alternatives for fuel and construction purposes. EMA should also stop panning activities, as well as ensure that all new mines undergo full environmental impact assessments as per EMA statutes in order to reduce land degradation in the district.

Key Words: Geographic Information System, Remote Sensing, Land use, Land cover

Crop Diversity Measurement at Dufuya Gardens and Insukamini Irrigation Scheme in Lower Gweru Communal Lands

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Midlands State University

ABSTRACT
Dufuya wetland gardens and Insukamini irrigation scheme in Lower Gweru communal areas of Gweru district are two examples of how rural communities can be self-reliant if they are capacitated. This study sought to compare crop diversity between these two vegetable producing schemes. The location of the two areas and the selected plots were determined using the GPS (global positioning system) hand receiver. Maps of the quadrants were produced in a GIS (geographic information system) on a computer. Simpson’s index $D = \sum (Pi^2)$ was used to measure crop diversity while the Shannon-Weiner index ($H$) was used to measure crop evenness. Results show that although both schemes are viable, Dufuya Gardens have higher crop diversity than Insukamini irrigation scheme. The study recommends that AGRITEX officers at Insukamini scheme advise farmers to diversify their crops in order for their produce to be more competitive on the market and also to cushion farmers against the effects of natural hazards. Given the success of the two schemes, the government must seriously consider sustainable utilization of the many small-scale dams and wetlands lying idle across the country for crop production in order to empower poor rural communities as well as alleviate poverty.

Key Words: Crop diversity, evenness, Simpson’s index, Shannon-Weiner index.

ABSTRACT
The article presents and discusses children’s game songs (mitambo yevana) usually performed during children’s play time. Each game song is transcribed and discussed to unpack the role the game plays in developing certain skills and concepts in children. The article is a follow up of an applied action research carried out at Chemhanza Mission on Hwedza District of Mashonaland East province of Zimbabwe. Children are products of the social fabric whose social experiences are woven within the nexus of social webs generated by social power vested in the social system. One way in which children develop physically, intellectually, socially and morally skills through playing games that are accompanied by either rhymes or songs. The games discussed in this article are motsiro, zai rakaora, vana vana huyai, sarura wako, kana ndikadayi, chamutswinye mutswinye, chitima, chinyunyunyu, sapero, and maringoringo.

Key Words game song, rhyme, children
Mbira Dzavadzimu And Its Space Within The Shona Cosmology: Tracing Mbira From Bira To The Spiritual World.

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ABSTRACT
Mbira dzavadzimu is a musical instrument commonly associated with the Zezuru, a sub-ethnic group of the Shona of Zimbabwe. Its popularity arises from its ability to ensnare the spirits in spirit mediums. It is a common belief that the Zezuru, like any other African ethnic group, have a very strong relationship with their ancestors. This progeny-progenitor relationship depicts an everlasting relationship between the living and the dead and ultimately acts as the basis of the Shona philosophy that death is not the end of life but a breakthrough into a totally new world of the invisible which they call nyikadzimu. In this article the writer will unpack the indigenous knowledge system that informs the Shona cosmology as it relates to mbira dzavadzimu and its space in Shona spirituality. The data that furnishes this article is part of the writer’s unpublished Master’s thesis (2009) in which he establishes the relationship between mbira dzavadzimu modes and spirit possession. The study adopted an ethnographic paradigm in which empirical data was collected through participant observation during a field study in Chikomba and Hwedza districts. The data was then analysed qualitatively and the findings revealed that both the mbira instrument and the pieces performed on it belong to the ancestors; hence there is a very strong and permanent relationship between mbira pieces and spirit possession. It is from this relationship that mbira music draws the power to evoke spirits in spirit mediums (masvikiro) during all-night ceremonies (mapira). Consequently the whole Shona cosmology greatly depends on mbira dzavadzimu.

Key Words Mbira dzavadzimu, bira, spirituality, spirit medium, possession
Solid Waste Management Practices in the Informal Sector of Gweru, Zimbabwe

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ABSTRACT

This paper contributes to the debate on the role of the informal sector in solid waste management by examining the effectiveness of informal sector solid waste management practices in transforming waste into non-waste in the city of Gweru in Zimbabwe. The study focused on 589 informal enterprises that were surveyed using questionnaire interviews and focus group discussions with key informants. Analysis of solid waste management in the informal sector of Gweru has revealed that large amounts of waste are generated indicating poor material efficiency in the enterprises, especially in food market areas where huge amounts of biodegradable material and vegetable wastes are generated and disposed of haphazardly. Analysis of the key factors that include solid waste generation rates, collection frequencies and transportation, waste minimisation and reduction practices showed that the current waste management system is unsustainable in the long run. The Municipality of Gweru needs to provide more resources for financing, training and manpower to enable effective provision of an environmentally friendly solid waste management system in the city, including the informal sector.

Key words: Solid waste, waste minimisation, collection, disposal, safety, environment, informal sector.

Analysis of Institutional Solid Waste Management in Gweru

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ABSTRACT

Of all environmental problems that have come into focus in Gweru, institutional solid waste management has been the slowest to develop either direction or regulatory mechanisms. This study examines the characteristics of waste generated and the effectiveness of the waste management system in the institutions. Measurements were used to determine the quantities of waste generated and interviews and questionnaires were employed to assess the soundness of the system. The general picture is that significant quantities of waste are generated in the institutional sector, but there are no sound practices for managing the waste. This paper attempts to provide a framework for policy and planning strategies relating to solid waste management in public and private institutions in Gweru. Presently institutional solid waste management is an area in which our ignorance still exceeds our knowledge.

Key words: Institution, solid waste, sound practices, environmental problems, Gweru

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Schools as Theatres of War: Towards Pacific Settlement of Disputes in Zimbabwean Schools

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ABSTRACT
Conflicts have become part and parcel of schools’ administration world over. This indeed is a paradox because of the amount of energy and resources expended by schools to prevent and resolve conflicts. A total absence of conflict would be unbelievable, boring, and a strong indication that conflicts are being suppressed. Understanding the causes of conflicts may help us resolve current conflicts or even prevent future ones from occurring. The objectives of the study were to identify the causes of conflicts, establish the type of conflicts, find out how conflicts are managed, identify conflict management methods and determine techniques for conflict resolution in schools. The study adopted a qualitative design using a case of Zaka district. The target population was 40 schools in Zaka district with a population of over 400 teachers. Conflicts in Zimbabwe’s primary and secondary schools have become a major problem that all stakeholders in education should take a great concern. It affects the community, the school administration and the government directly or indirectly. If allowed to continue, it will ruin educational institutions and education itself. This paper recommends pacific settlement of disputes to improve the quality of education in our schools.

Key words: conflict, conflict resolution, Pacific dispute settlement
ABSTRACT
Access to quality child care and education is an important support feature for Early Childhood Development children (ECD) in societies. This study investigated the culture of inclusion of children with hearing impairment within primary school setting. The objective of this study was to establish the current status of inclusion regarding ECD children who are deaf. A qualitative case study methodology, where data was collected using observations, in-depth and focus group interviews from a sample of participants consisting of school heads, parents and teachers from three public primary schools in Masvingo Urban was used. Most participants reported positive attitudes towards the philosophy of inclusion. Findings also reflected that ECD services are not easily accessible to children with hearing impairment (HI). Conventional schools prefer children with mild hearing problems to those who are totally hard of hearing. This is because of inadequate training in special education, lack of resources, late discovery of the deafness and high teacher-pupil ratio. It is concluded that ECD centres require improved access, specialist teachers, adequate support in terms of assistive technologies and positive attitude from school Heads, parents, teachers and Education Officers as critical stakeholders to raise awareness and increase support for deaf ECD children.

Key Words Early childhood development, inclusion, hearing impairment, educational access.
ABSTRACT
During toddlerhood years, children are rapidly developing patterns of behaviour and psychosocial skills that can be long lasting. It is the duty of early childhood Development caregivers to create optimal opportunities that try to identify and respond effectively to children’s total development. The aim of this qualitative research was to explore the Day-care caregiver’s understandings of temper tantrums, insights into their basis and management strategies that caregivers employed in order to limit negative behaviours that were associated with them. The study employed a case study design in which the purposive sampling strategy was used to select twelve teachers who participated in the study. Data was collected using the observations, questionnaires, and interviews. The major findings of the study were that caregivers had some working knowledge of tantrum behaviour in toddlers but lacked knowledge on how to manage them. Caregivers did not report consistent practices of regulating temper tantrums; hence the study concluded that management of toddlers temper tantrums in day care centres was poorly handled therefore in-service workshops for tantrum management and curriculum upgrading for teacher training institutions was recommended.

Key Words: Early Childhood Development, toddlers, caregivers, temper tantrums and Day-care

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ABSTRACT

The purpose of this paper is to explore the influence best Career Management practices have on both individual and organizational performance. The proposed framework intends to add a leaf on the understanding of specific processes and activities that mediate between best career management practices and the organizational performance. A range of relevant literature is explored and a conceptual model is proposed and discussed. This paper however proposes answers to “how best Career Management practices can influence the performance. It is suggested that Career management practices play a very crucial role which lead to superior organisational performance hence gaining a competitive advantage. The paper can assist all organisation stakeholders to understand the necessities of career management practices at both organizational and individual level in leading to a superior and sustainable performance. Quantitative and qualitative research methodologies were used and 30 randomly selected respondents from Pick and Pay retail Supermarkets in Masvingo urban represented retail supermarkets in Masvingo. Self-administered questionnaires were distributed to respondents to give a clear comprehension of the relationship between best career management practices and the organisational performance. It was established that organizations should place high value on career management practices as this positively influence high organisational performance. The results and the recommendations of the study give a positive guide to Retail Supermarkets whose future is based on high performance and best industry competitive advantage.

Key Words: management, career, performance, organisational practices.
ABSTRACT
It is the mandate of Higher Learning Institutions to foster strategies that enhance knowledge and motivationally encourage creativeness and innovativeness for the economical growth of the Global Society. This paper comprehensively discussed the inseparable relationship between the society and the designing of Higher Education curriculum. Curriculum design follows a dynamic trend that is multi-factorial in nature. Influential factors such as environmental, political and social are seriously considered in formulating adaptable curriculum that reflects the societal needs in the field of Education. Of concern is societal factor that tends to be the most influential among others. The curriculum designers are forthwith find ways to protect cherished society beliefs not to argue against each other. The designing of curriculum should assume that certain accepted values are promoted without imposing one denomination’s belief or practice. The designing process should also promote change and protect the roles of Higher Learning Institutions and the laws of the land hence the curriculum and society mirrors each other. Data was both quantitatively and qualitatively analysed to give a clear comprehensive understanding of the importance of merging the two issues. The study will go a long way in guiding the curricularists in formulating curriculum design policies locally, regional and internationally.

Key Words: curriculum, design, society, innovativeness, economical growth.
The 21st century has seen Information and communication technologies (ICT) becoming commonplace entities in all aspects of life and especially the cornerstone in teacher education in Zimbabwe. The use of ICT in education lends itself to more student-centred learning settings. But with the world moving rapidly into digital media and information, the role of ICT in teacher education is becoming more and more important and this importance will continue to grow and develop in the 21st century. The integration of information and communication technology (ICT) in teacher education provides more opportunities for student teachers to work better in an information age. However, some barriers may discourage student teachers to fully enjoy the merits of ICT usage. Examining the barriers for using ICT in teacher education can assist the educators to overcome the obstacles and integrate the ICT in everyday education. This case study of three teachers colleges in Masvingo province aims to investigate the student teachers’ perceptions of the barriers and challenges preventing teachers to integrate ICT in their training.

Key Words: Information and communication Technology, teacher training,
ABSTRACT
This study examined manifestations and patterns of child labour as it relates to ECD children’s learning and development. A qualitative research approach was used in this research. Participants of this research were selected through purposive sampling. Interviews and document analysis were used to collect data. Participants included parents and children from Gweru urban and peri-urban schools, farms, mining areas and sub-urban residential areas. Data from transcribed interviews and documents was thematically analysed in line with the qualitative research approaches. The study revealed that Early Childhood children participated in working activities ranging from weeding, gold panning, caring for the sick, vending and begging in streets. The study concluded that parents violate children’s rights through child labour, which deprives children from developing and learning effectively. To curb child labour and protect the rights of children, the study recommends enforcement of policies, budgeting for free primary education by the Government to allow working children access ECD and refrain from working activities, and holding awareness campaigns on children’s rights.

Key Words: Child, Early Childhood Development (ECD), exploitation, child work, child labour and poverty

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ABSTRACT
Albert Schweitzer was a Missionary medical doctor to Africa. Apart from his academic excellence, his missionary experiences and observations reveal the tension between colonization and civilization. This research serves to reveal that colonialism and civilization are incompatible. Schweitzer, in his books On the Edge of the Primeval history and Man from the Primeval Forest (in one volume) (1948) exposes the evils of colonization which hinders progression of civilization. The colonial government has no heart for the lives of the natives but that which promotes their own interest. A critical evaluation of his experiences and observations would probably reveal the antagonism between colonialism and civilization.

Key Words: Colonisation, obstacle, civilisation, antagonism
ABSTRACT
Leviticus 19:35-36 prohibits the use of ‘dishonest standards when measuring lengths, weights or quantities’ and encourages the use of ‘honest scales and honest weights, an honest epha and an honest hin’. The use of dishonest measures negates the use of justice, while justice can be fully realized in use of correct calibrations when measuring. The question which may rise is that: would there still be a measure of justice in a dishonest scale since some measured quantities will be provided to some extend? It seems that, literarily dishonest measures would entail more or less quantities while honest measures would be the exact quantities. If the dishonest measurer is more it may not sound to be injustice at all. A socio-rhetorical exegesis of Leviticus 10:35-36 may guide us to advocate for justice as far as measures are concerned.

Key Words: dishonesty, injustice, standards, measures.
ABSTRACT

Even though many early childhood development centres are equipped with the latest computer technologies, multiple studies seem to be pointing to the fact that these are not used functionally for the benefit of the learners. This qualitative study explores the teachers’ perceptions and practices regarding the use of computers for instruction in early childhood development settings. The study employed the case study research design and used the purposive sampling strategy to select twenty teachers who participated in the study. Data was collected using the observation, questionnaire and interview. The major findings of the study were that: teachers had a limited understanding of the value of computer education for young children, they also lacked requisite knowledge and skills in computer operations, and as a result most of them did not use computers for instruction. The study concluded that computer education at early childhood development centres is not being effectively implemented due to various challenges. It is recommended that relevant school authorities and stakeholders find ways of providing quality computer facilities, equip teachers with the necessary knowledge and skills in computer literacy, and supervise the implementation of computer education in preschools.

Key words: Early childhood development settings, computer, perceptions, practices

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**ABSTRACT**

Early childhood years serve as an essential foundation for the entire child’s successive literacy development. Despite some improved attention given to children’s early literacy development, there are still gaps in terms of understanding what actually takes place in home environments. The purpose of this qualitative research study was to explore the extent to which parents supported preschool children’s emergent reading initiatives within home settings. A case of a considerable number of parents was selected using purposive random sampling from one high density suburb in Zimbabwe. Questionnaires, interviews and observations were administered. Results show that parents did not value emergent reading, especially for pre-schoolers and did not engage themselves well for reading with young children. The study recommended, among other recommendations, that parents be educated on the value of emergent reading especially for pre-schoolers.

**Key Words:** emergent reading, pre-school children, home environments
ABSTRACT
The researcher was born and bred in the Karanga family community in Chivi District of Zimbabwe and is at home with Karanga traditional beliefs and practices experiencing the deep rooted community in their ancestral religion. While Christianity on the other hand calls for a complete turn round into it still the element of being an African with my religion remains. There seems to be resistance with many even some who have become part of the Christian community to make a complete turn round, which forces the researcher to be interested to trace the African origin of Christianity. The question that remains as a puzzle is if the merging of the two religions were on submission or on understanding. This paper seeks to summarize the African origin of Christianity looking at how it originated, African people’s reaction and parts of Africa affected, time, where originators came from, and who they were will be covered in this paper.

Key Words: traditional. Beliefs, Christianity, karanga, religion
ABSTRACT
The necessity of advancing international competence for Africa's higher education students is becoming more apparent as the international community becomes more interdependent and connected. We are all aware today that we live in a global community with forces that directly affect our lives being shaped by persons and events far away from us in places we have never seen or visited. Internationalisation of education is now very high on the agendas of national governments, international bodies and institutions of higher education. The question that begs for an answer is; are universities and colleges in Africa preparing their students to function effectively in a global society in which time and space no longer insulate the nations, people and markets of the world? This paper aims to discuss the framework for a comprehensive global higher education system that encompasses global issues and challenges. The authors have noted in their discussion some gaps that need to be added to the global perspective on international education. They argue in the article that educationists in Africa, for the most part are not adequately prepared to teach learners with special needs and even those who wish to do so face a lot of challenges given the multiple demands on special needs education. Extraordinary commitment is therefore necessary to integrate special needs education into the internationalisation of higher education programme in Africa.

Key Words: Globalisation, Global competence, International education, Internationalisation, Special needs education
AbSTRACT

Disabled people throughout the world, as all other human beings, undoubtedly desire to fully participate in ordinary activities of life such as working, playing, gaining education, striving for success, raising families, expressing their sexuality, involvement in community development and participation in larger social and political enterprises. However, their needs have generally been ignored, efforts stifled and their quest for positive disability representation has regrettably been mediated by other ‘more powerful’ entities such as Government agencies, non-governmental organisations and various other global institutions, chief among them being the media in all its forms. Consequently, In Zimbabwe for example, disability imagery has therefore inevitably been framed within the realm of charitable and medicalised discourses in which the primary focus is on individuals’ impairments, and hence, disability representation and portrayal is ‘clichéd’, ‘stereotyped’ and ‘archetypal’ which crystallises the ‘objectisation’ of persons with disabilities by society. While the advent of social media ushered in a great sense of hope for disabled people in the ‘Global North’ where there has clearly been wider politicisation on issues to do with disability rights and the significance of self-expression, I would argue that in the ‘Global South’, most disabled people’s priorities are focused on the need for survival. Therefore, even if social media could bring them numerous benefits including being a platform on which they can tell their own stories, through which they can lobby for and advocate their issues and ultimately attempt to ‘reconstruct their battered image’, in practice, this will remain a dream for some time to come. The prohibitive costs for acquiring devices which are compatible with social media platforms, gadgets with the appropriate adaptability for people with various impairments, and the unaffordable charges for internet connectivity are an incredible hindrance to social media accessibility. The more than 90 percent of poor disabled people in these low-income countries such as Zimbabwe, also lack the necessary education and training, as well as adequate politicisation which are prerequisites for useful utilisation of social media technology.

Key Words: disability inclusion, social media, information and communication technology

369. Application of Corporate Governance Recommendations to Reduce the Ugly Head of Corruption in Zimbabwe

Mr C.M.A. Mutiwanyuka

ABSTRACT

‘Governance’ refers to the way in which something is governed and to the function of governing. The governance of a country refers to the powers and actions of the legislative assembly, the executive and the judiciary. Several authors have proffered several other definitions which cover the governance of companies and their management thereof. Despite control measures that prop governance methods and elicit for best ways to keep the stakeholders happy, some members of management have devised ways and means of enriching themselves at the expense of the investors. The paper exposes how millions have been siphoned out and how, as a result, management and auditors, who are the protectors of the investors, have been discredited. The perpetrated frauds have, over the years, resulted in the creation of the governance code to reduce these adverse activities. Zimbabwe, as a country, has become prone to corruption and seems to have lost the breaks to reduce the ugly head of corruption. To this end, the paper proposes solutions to reduce corruption by encouraging transparency, honesty, risk reduction, control and ‘whistle blowing’, good governance and standardised corporate reporting.

Key Words: Defining corporate governance; purpose of corporate governance; protection of shareholders’ assets; millions of dollars stolen; Zimbabwe falling into the fraud ring; recommendations to reduce corruption.

Presented by Mr C.M.A. Mutiwanyuka at RIE 2014
Reserve Bank of Zimbabwe

370. Assessing the Impact of the Real Effective Exchange Rate on Competitiveness in Zimbabwe

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ABSTRACT
This paper attempts to estimate the equilibrium real effective exchange rate for Zimbabwe, with a view to determine the level of adjustment required to attain both internal and external balance. The macro-balance approach which is a standard model used by the International Monetary Fund (IMF) to assess equilibrium exchange rates was applied to estimate the medium-term value of the exchange rate that is consistent with internal and external balance. Based on the calibrated current account balance to the Gross Domestic Product (GDP) norm of 11 percent and exchange rate elasticity with respect to current account of -0.31, the analysis found that the real effective exchange rate would need to depreciate by about 45 percent to eliminate the disparity between the current account norm and the medium term current account forecast. However, given the lack of policy autonomy on the exchange rate front to undertake external devaluation, the disparity can only be removed through a fiscal or an internal devaluation process. Fiscal devaluation measures entail reducing taxes on labour and increasing value added tax on imported products, while internal devaluation can be achieved through relative price changes and improvement in productivity. This entails removing structural bottlenecks in the economy and promoting investment in infrastructure to reduce the cost of doing business. The policy implication is the need for Government to come up with strategies for undertaking fiscal and internal devaluation to eliminate the competitiveness challenges caused by the real effective exchange rate overvaluation.

KEY WORDS: External Balance, Real Effective Exchange Rate, Macroeconomic Balance Approach

DATE AND WHEN THE STUDY WAS COMPLETED
ABSTRACT
This paper attempts to estimate the yield curve for Zimbabwe under a multiple currency environment. The paper was motivated by the lack of a properly discernible yield curve that has typified the economy since the adoption of multiple currencies in 2009. This study uses the uncovered interest rate parity approach, which relates domestic interest rate to foreign interest rate and exchange rates. The estimation of the yield curve is based on foreign yield curves adjusted for observed credit risk premium and inflation differentials. The yield curve was simulated to be in the range of between 700 basis points to 800 basis points. The estimated rates are, however; significantly lower than the observed rates in the market averaging 14000 basis points. Results of this study underscore the need for banking institutions and monetary authorities to find a lasting resolution to the high interest rate regime that has characterized the multiple currency regime. Specifically, the paper recommends the need to align the interest rate structure in the economy to the implied yield curve which is based on macroeconomic fundamentals.

KEY WORDS: Interest Rate, Yield Curve, Credit Spread.

DATE AND WHEN THE STUDY WAS COMPLETED
Completed in 2015 and to be published in the RBZ Working paper series
An Econometric Study of the Determinants of Foreign Direct Investment (FDI) In SADC Countries

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ABSTRACT
The growing global competition for foreign direct investments (FDI) has seen many countries and regional economic blocks adopting innovative and bolder investment promotion strategies and policies to attract FDI. Against this background, this paper reviews the experiences of SADC countries in attracting foreign direct investment and explores the major determinants of FDI in the SADC region. A cross-country panel regression analysis using data from 1996-2011 for SADC countries was applied to ascertain the determinants of FDI. The estimation results from a panel of SADC member countries show that agglomeration, credit to private sector, urban population share, trade openness, market size and infrastructural development have a positive significant relationship with FDI inflows in the region. The major recommendation from the study is the need to improve both institutional and governance indicators to create a conducive business environment for FDI. There is also need for SADC member countries to remove restrictions on market seeking and locational advantage FDI. Member states also need to strengthen regional integration and greater diversity on investment matters for the region to benefit from synergetic effects of regional integration through the halo effect.

KEY WORDS: Foreign Direct Investment, Panel Data Analysis, Hausman Test, Fixed Effects, Random Effects

DATE AND WHEN THE STUDY WAS COMPLETED

Accepted and awaiting publication in the African Integration Review Journal. The paper was also published as a Working Paper: FDI in SADC Countries on the SADC Website
An Empirical Assessment of Binding Constraints to Zimbabwe’s Growth Dynamics

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ABSTRACT
This paper provides an analysis of the growth diagnostic for Zimbabwe using the framework proposed by Hausman and Velasco (2004). An econometric approach is also applied to assess the sources of economic growth during the period 1980 to 2013. The results suggest a significant decline in productivity and capital stock during the period from 2000 to 2008. The contribution of capital to economic growth was, on average, negative between 1990 and 2008, largely reflecting a contraction of gross fixed capital formation (-3.2 percent). Labour force participation has remained fairly static, which implies that it might not have been a binding constraint to Zimbabwe’s growth. The subdued growth rates for Zimbabwe have, therefore, mainly been attributed to decline in the capital stock and productivity. As such, addressing capital and productivity constraints is critical in jump-starting the economy into a positive growth trajectory. There is, however, need for a clear-cut transition from igniting growth to sustaining it into the foreseeable future. This requires government to put in place appropriate contingency plans to respond to external shocks that have the potential of throwing economic growth in disarray.

KEY WORDS: Growth Diagnostic, Macroeconomic shocks, Cobb Douglas, Regression Analysis

DATE AND WHEN THE STUDY WAS COMPLETED
Completed in 2015 and to be published in the RBZ Working Paper Series
Dynamics of Interest Rate Spreads In a Multiple Currency Environment: The Case for Zimbabwe

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ABSTRACT

This paper assesses the dynamics of interest rates spreads under a multiple currency environment. The analysis involves examining the determinants of interest rate spreads. The results suggest that bank operational inefficiencies have been the major drivers of high interest rate margins under the multicurrency environment. The higher interest rate spreads are also a reflection of deepening of the financial sector into retail and SME lending or lending to riskier clients. Although this may reflect more diversified lending, which would have the positive benefit of increased specialization and deepening of knowledge of certain sectors, it could also have a downside risk in that it could give banks more market power. Higher spreads across all banking institutions despite size might also be a reflection of collusion among banks and not reflecting operational viability. The results underscore the need for banking institutions to come up with measures to reduce operational inefficiencies to reduce costs and expand their market size to increase operational efficiency instead of increasing the interest rate margins.

KEY WORDS: Interest Rate Margin, Efficiency, Multiple Currency Regime.

DATE AND WHEN THE STUDY WAS COMPLETED

Completed in 2015 and to be published in the RBZ working paper series
ABSTRACT
This paper provides an analysis of the effects of fiscal policy on the monetary policy transmission mechanism in Zimbabwe under a dollarised environment. The analysis was conducted using an Unrestricted Vector Auto regression model to identify shocks to fiscal variables and their impact on the monetary policy transmission mechanism. The variables analysed are interest rates, budget deficit, inflation, money supply and a proxy for economic activity over the period 2009 to 2014. The impulse response functions and variance decompositions are used to study the effects of identified shocks. The results suggest that nominal interest rates respond positively to a fiscal deficit shock. Furthermore, the results suggest that the response of inflation and money supply are muted, reflecting the limited role played by fiscal policy in influencing money supply and inflation under the dollarized environment.

KEY WORDS: Structural VAR, Fiscal deficit, Monetary Policy, Transmission Mechanism

DATE AND WHEN THE STUDY WAS COMPLETED
Completed in 2015 and to be published in the RBZ Working Paper series
Assessing Banking Sector Competition in Zimbabwe

Dr. K. Mlambo and Dr. N. Mupunga

Reserve Bank of Zimbabwe

ABSTRACT
This paper assessed the extent to which banking sector consolidations under the multicurrency regime promoted banking sector competition in Zimbabwe. The assessment was conducted by applying the Panzar Rosse (1987) model, which estimates bank competition using the H-statistic. The paper also applied the Lerner index which measures the degree of market power of banks for the same period. The H Statistic was estimated to be 0.52, which implies that the Zimbabwean banking sector follows a monopolistic competition. The Hefndarl Hischamn index which is also a measure of competition declined significantly following the introduction of the multicurrency regime. It can, therefore, be concluded that the consolidation of the banking sector under the multicurrency regime enhanced competition in the banking sector, along with the ensuing benefits in terms of enhanced safety, soundness and resilience of the sector. The results were also confirmed by the Lerner index which was declining since 2009, suggesting declining market power of banks in the setting of prices. The results of this study calls for authorities to consider competition policy when making amendments to banking regulations and when approving further banking sector consolidations. Moreover, the need to re-orient policies toward competition is highly critical to avoid the welfare loss emanating from increased market power of banks.

KEY WORDS: Competition, Learner Index, Panel Data, Regression Analysis, H-statistic

DATE AND WHEN THE STUDY WAS COMPLETED
Completed in 2015 and to be published in the RBZ Working Paper Series
**ABSTRACT**

Flat plate and concentrator solar water heaters are widely used for domestic and process heat generation. The flat plate solar collectors that are available in the Zimbabwean market can adequately provide thermal energy at temperatures below 80°C for domestic applications. A study by the SIRDC revealed that various industries in Zimbabwe require process heat in the medium-to-high temperature range (80 to 300°C). This project aims to design, develop and characterise a medium-to-high temperature parabolic trough solar water heater. Up to now only very limited experience exists for this temperature range. Optical and thermal models of the concentrated solar system will be developed. The fabricated prototype has to be suited to the Zimbabwean weather conditions as opposed to the current scenario whereby Solar Water Heaters are imported from Europe or Asia without adaptation to suit local conditions. The Parabolic Trough solar water heater has wide applications in industry, the domestic sector, food processing and in agriculture.

**Key Words:** Solar water heater, Parabolic trough, concentrated solar energy

**Expected completion date:** 31 December, 2016

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ABSTRACT

Energy is a critical factor in the development of any society. Dwindling fossil fuel energy resources, and the climate change challenges associated with large scale use of fossil fuels requires that alternative and clean energy sources be developed. Fuel cell technology is one such technology that shows promise as a clean alternative energy source. The wide spread commercialization of fuel cells has been hampered by high capital costs. It is with this in mind that a low cost polymer electrolyte membrane fuel cell is to be developed by SIRDC using locally available raw materials. Zimbabwe is endowed with the vast majority of materials used in the fabrication of fuel cells such as platinum for the catalysts. The research seeks to find ways of reducing the cost of fuel cells by substituting components with locally available raw materials. This is expected to reduce the cost of the fuel cells and thus make them more appealing for local adaptation. Areas targeted for local substitution include the polymer electrolyte membrane, platinum catalysts as well as the equipment for the fabrication.

Key Words fuel cell, polymer electrolyte membrane; low cost

Expected date of completion: June 2016
379. Estimation of Maize Yield Using Vegetation Condition Index

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ABSTRACT
Maize is a key crop contributing to food security in Southern Africa yet accurate estimates of maize yield prior to harvesting are scarce. Timely and accurate estimates of maize production are essential for ensuring food security by enabling actionable mitigation strategies and policies for prevention of food shortages. In this study, we regressed the number of dry dekads derived from vegetation condition index (VCI) against official ground-based maize yield estimates to generate simple linear regression models for predicting maize yield throughout Zimbabwe over four seasons (2009-10, 2010-11, 2011-12, and 2012-13). The VCI was computed using Normalized Difference Vegetation Index (NDVI) time series dataset from the SPOT VEGETATION sensor for the period 1998-2013. A significant negative linear relationship between number of dry dekads and maize yield was observed in each season. The variation in yield explained by the models ranged from 75% to 90%. The models were evaluated with official ground-based yield data that was not used to generate the models. There is a close match between the predicted yield and the official yield statistics with an error of 33%. The observed consistency in the negative relationship between number of dry dekads and ground-based estimates of maize yield as well as the high explanatory power of the regression models suggest that VCI-derived dry dekads could be used to predict maize yield before the end of the season thereby making it possible to plan strategies for dealing with food deficits or surpluses on time.
ABSTRACT
Zimbabwe’s economy is currently recovering from a decade (2000-2008) of economic crisis that saw economic output cumulatively declining by more than 45% (Zimstats, 2014). The trend in agricultural production indices also showed a similar trend for the period 2004 to 2009. The food processing sector, which is heavily dependent on agriculture for raw materials, also shrank leading to loss of jobs and incomes as well as food shortages. The study was aimed at conducting value chain analysis of selected subsectors in the Agro-industries/Food and Beverages sector. Specifically, to identify policies, measures and strategies to enhance competitiveness of the selected value chains. This entailed the selection of specific commodities which included cereals and cereal products; meat and meat products; horticulture; beverages; dairy and dairy products and confectionery. About 150 representative agro-industries/food and beverages value chain players throughout all the agro-ecological zones of Zimbabwe participated. The sample pool consisted of various stakeholders in the value chain including farmers, processors, marketers, regulatory authorities, research institutions and farmer organizations. Data was collected through reference group meetings, focus group discussions, questionnaires and structured and unstructured interviews of key informants. The UNIDO value chain analysis tool (2010) was adopted for the analysis. The study showed that more than 90 % of the stakeholders faced challenges of funding and liquidity. In particular, producers faced a challenge in meeting lending requirements (collateral). Processors attributed their failure to adopt new technologies and expand operations due to liquidity constraints. The financiers on the other hand also cited high default rates on loans issued. High cost and erratic supply of utilities was also pointed out as a major limitation to capacity utilization. The technologies used in the manufacturing plants were out-dated and required replacement with newer technologies in order to improve the economies of scale and thus have competitive pricing of the final product. Other limitations to competitiveness were; post-harvest losses, unfair trade environment, poor linkages between partners within the value chain and unfavourable policies and regulations. It was realised that all value chains were broken, hence, the coordination between stakeholders to remove bottle necks and aiding production was noted to be a key driver into improving these value chains.

Key Words Agro-Industries, Food and Beverages, Value chain analysis, Viability, Competitiveness Zimbabwe.
Seke Teachers

381. Women’s Participation in Community Development Projects: A Study of the Factors That Hinder or Promote Participation in Ward 2 of Zaka District, Zimbabwe

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ABSTRACT
This study seeks to establish the factors that militate against women’s participation in community development projects. A total of sixty five women were sampled for the study. A mixed method approach was used in the study. Multistage sampling technique was employed to select sixty five participants made up of fifty women from the villages in ward 2, community project officer, the ward coordinator, village head and the councilor for the ward 2. Observations and interviews were used to collect data in this study. The main findings of the study were that many women were not participating in community development projects because of family and career commitments, some were restricted by their husbands, lack of access to loans, and lack of business viability due to lack of knowledge on how to run the projects and limited markets. The study recommends that the Ministry of Gender, Women and Community Development should make sure that the projects in communities are well funded and maintained. The government should avail loans to women without attaching prohibitive aspects like collateral security. The government should equip women with entrepreneur skills to run projects that are viable. It therefore recommends that a further research be instituted to explore and establish the qualitative impact of each determinant here identified.

Key Words: Community development, collateral security, entrepreneur, business viability

Dates; 17 – 7-14 to 10-01015
382. The Age Of Consent: Is There A Shared Understanding Of What It Really Mean?

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ABSTRACT
The world over the age of consent is used as a child empowerment, protective and preventative tool. Philosophically, it has been argued that the age of consent supports teenagers as they negotiate the most profound aspect of adulthood; their sexuality. In Zimbabwe, the age of consent has become a subject of debate following comments by prosecuting authorities insinuating that could be as low as 12 years. During this stage in their lives teenagers face abuse, bodily violence and exploitation. There are mixed feelings from religious sects, legal experts, cultural and customary beliefs over the age of consent. Zimbabwe is a signatory to key international and regional instruments such as United Nations on the Rights of the Child (UNCRC), the African Charter on the Rights and Welfare of the Child (ACRWC) and the Convention on the Rights of the Child (CRC). The Constitution of Zimbabwe and the Child Protection Act are some of the statutes whose main import is to protect children from abuse and exploitation in Zimbabwe. The study sought to analyse the perceptions and understanding of Early Childhood Development (ECD) educators on the age of consent. The main objectives of the study were to analyse the views and perceptions of ECD educators on the age of consent and to highlight the problems of violence and exploitation these children experience. The interpretivist philosophy guided the methodological design of the study where in-depth interviews, focus group discussions and document analysis were used as methods of collecting data. Purposive sampling was used to select 20 lecturers to participate in the study. The major findings were that there is no shared understanding of the meaning of age of consent among ECD educators. The age of consent should be set at the same level as the age of majority (18) because one will be mature. It was recommended that the age of consent should be the same age for both and girls and it should be set at the same level as the age of majority which is currently at 18 years.

Key Words: age of consent, legislator, minor, ECD educator

Date 22 July 2015- 15 October 2015
ABSTRACT
The study is an exploration for opportunities for distance and open learning in the primary school system. Distance and open learning has become the buzz word in higher and tertiary education. One of the greatest benefits attributed to distance and open learning is its individualised approach. However the freedom involved in distance education may prove to be beneficial and harmful to some. How do primary school learners cope with such eventualities? The study is conducted using Government Primary Correspondence School experiences. The Government Primary Correspondence School is the only primary school in Zimbabwe and in Africa that offers distance and open learning to pupils in the primary school. A register created during their 2014 "open day" was used to systematically randomly select 50 parents and 50 pupils. The school Principal, 12 teachers and 5 Ministry of Primary and secondary Education who also took part in the study were purposively sampled. In-depth interviews, document analysis and observations were used as methods for data collection. The study found the primary correspondence system to be an effective and alternative to formal education. It is recommended that the school should be resourced and supported as it complements the formal system.

Key Words: Correspondence, open and distance learning, formal education

Research conducted from 10 March 2013-7 December 2014
ABSTRACT

The study was conducted to find out the patterns of violence against women as perceived by working – class females in a Nigerian City. A total of one hundred and fifty respondents were selected from the target population using the multi-stage sampling procedure. A fifteen-item questionnaire tagged “patterns of violence against women questionnaire” was designed and used to elicit the required responses from respondents. The questionnaire was both face and content validated and the reliability determined using the test retest method. The correlation coefficient between the two administrations was 0. 76. Data collected were analysed using the descriptive statistics (frequency counts and percentages) for the demographic characteristics of respondents, while t-test and analysis of Variance (ANOVA) statistical procedure were used to test the hypotheses. Results indicated that the most common form of violence against women is the physical violence while the least is economic violence. Based on the findings of this study, it was recommended that there be more enlightenment campaigns on violence against women and women be encouraged to talk about it. Culture has to change in order to eliminate all forms of retrogressive practices against women including violence against women.

Key Words: Violence, Pattern, Perception, Working – Class

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The Impact of Speech and Language Disorders on Pupils’ Learning and Socialization in Schools of Kalomo District-Zambia

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ABSTRACT
This study investigated the impact of speech and language disorders on pupils’ learning and socialization in schools of Kalomo District, Zambia. The Descriptive research design was employed for the study. The sample consisted of 48 pupils with speech and language disorders purposively selected from 6 schools. The instruments used for data collection were a questionnaire and a test for speech and language disorders. The instruments were both faced and content validated by experts. The questionnaires and test items were taken to experts at the University of Zambia and the Zambia Institute for Special Education (department of speech and language disorders) for validation. The questionnaire and the test were administered to the sampled students. The data collected were coded and analysed using the Statistical Packages for Social Sciences. Descriptive statistics and the regression analysis were employed. The result of the study revealed that the performance of pupils with speech and language disorder in English Language was low, but were average in their socialization. It was also discovered that 77.2% variance in academic performance was accounted for by the level of speech and language disorders. The positive beta value of 11.885 showed that, the less the severity of speech and language disorder, the better was the academic performance of pupils. The study also revealed that type of disorder and socialization accounted for 79% variance in academic performance. Type of disorder accounted 77.2% while socialization accounted 1.8%. The positive beta value of 11.648 for the type of disorder, and 6.099 for socialization indicated that, the less the severity of the disorder and the more pupils with speech and language disorders socialize the better is their academic performance. Type of disorder had greater influence on their academic performance.

Key Words: Speech disorder, Language disorder, Learning, Socialization, Disabilities, Articulation disorder, Communication disorder, Stuttering.

ABSTRACT
This study examined the predictive validity of entry criteria on academic success of students in the Faculty of Business Programmes at Solusi University. The predictors are the modes of entry and qualifications for admission into the university while the criterion is the Final Cumulative Grade Point Average (CGPA) at the end of university education. The sample for the study consisted of four hundred and sixty three (463) faculty of Business students who graduated in years 2007, 2008 and 2009. The stepwise regression was used for data analysis. The major findings of the study are that in general, ordinary level Mathematics and advanced level Accounts are predictors of academic success, and that the Cumulative Grade Point Average (CGPA) at the end of pre-university examination predicts academic success of the pre-university entrants.

Key words: Entry criteria, Predictive validity, Predictor, Criterion, Academic success

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ABSTRACT
This study examined the sources of National Youth Service Corps (NYSC) pre-posting anxiety among final year tertiary institution students in Ilorin metropolis of Kwara State, Nigeria. The descriptive survey method was adopted for this study. Two tertiary institutions were purposively selected for the study using a sample size to 200 respondents. The instrument for the study was a self-developed questionnaire which was both face and content validated and the reliability determined using the Cronbach’s Alpha reliability method. An Alpha reliability co-efficient of 0.76 was obtained. The questionnaire was administered personally by the researchers. The data collected were analysed using the descriptive statistics, the t-test and Analysis of variance (ANOVA). The results revealed that graduates that about participating in the NYSC Program do experience various forms of anxiety and that male are more prone to pre-posting anxiety than their female counterparts. Based on the findings, recommendations were made.

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Comparative Study of Effectiveness of Cooperative Learning Strategy and Traditional Instructional Method in the Physics Classroom: A Case of Chibote Girls Secondary School, Kitwe District, Zambia

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ABSTRACT
The purpose of the study was to compare the effectiveness of cooperative learning strategy and Traditional instructional method on pupils’ academic achievement and their motivation to learn in the physics classroom at Chibote Girls Secondary School in Kitwe District of Zambia. The research was a Pre-test- post-test control group design. The population of the study consisted of 625 Grade Eleven pupils studying at Chibote Girls Secondary School in Kitwe District and the Five (5) teachers teaching physics subject at the school. A sample 60 pupils and two (2) teachers were used for the study. Simple random sampling was used to select the teacher to teach the Traditional instructional method (control) class and convenience sampling was used to select the teacher to teach the cooperative learning (experimental) class. Pre- and post- motivation survey questionnaire of the five point Likert scale of strongly agree to strongly disagree and pre- and post- tests were used for data collection. The motivational survey questionnaire was face and content validated while the tests were drawn from standardized past physics examination questions of the Examination Council of Zambia. The reliability for the pre- and post-motivational questionnaire survey was determined using the Cronbach’s Alpha reliability method. The reliability coefficient of 0.334 and 0.901 was obtained for pre-motivational survey and post-motivational survey respectively. Factor analysis was carried out on the pre- motivational questionnaire survey and the communalities of the items on the pre- motivational survey ranged from 0.438 to 0.854 an indication that all the items on it were reliable. The two motivational questionnaires were therefore, used for the research. The data collected were coded and analysed using the Statistical Packages for Social Sciences (SPSS). The one way Analysis of Variance (ANOVA) and Univariate Analysis of Variance and ANCOVA were employed. The study revealed that the use of Cooperative learning strategy do improve pupils’ academic achievement as well as pupils’ motivation to learn than the Traditional instructional method. Therefore, it is evident that Cooperative learning strategy is more effective in the teaching and learning of physics than Traditional instructional method.

Key Words Effectiveness, Cooperative Learning Strategy, Traditional Instructional Method

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ABSTRACT
The purpose of the study was to determine the degree to which the implementation of differentiated instruction was carried out in Primary schools. The research design was descriptive. The population for the study consisted of all the 43 Primary schools of Kabwe District with a total population of 1817 teachers. The sample for study was made up of 15 randomly selected schools and 241 teachers selected using the simple random sampling technique. The instrument for the study was a self-constructed questionnaire of the five point Likert scale. The questionnaire was face and content validated and the reliability of the instrument determined using the Cronbach’s alpha reliability method following a pilot study using 30 respondents from two schools that were not part of the main study. An alpha reliability coefficient of 0.740 was obtained. The data collected were coded and analysed using the Statistical Packages for Social Sciences (SPSS). The descriptive statistics and regression analysis were employed. The study revealed that differentiated instruction was implemented in schools. Findings from the study revealed that teachers frequently adapted the curriculum to pupils’ needs and were sensitive to learners needs. Teachers frequently used classroom strategies in the implementation of differentiated instruction, they enjoy administrative support however teaching materials were not available in all subjects. Regression analysis revealed that administrative support and learners’ background accounted for 37% and variance in the implementation of differentiated instructions. Administrative support accounted for 27.2% while learners’ background accounted for 9.8%. Administrative support therefore is a major factor in the implementation of differentiated instruction. The more there is administrative support, the more the implementation of differentiated instruction. It was recommended that school administrators needed to give more support in the area of resources for the successful implementation of the programme.

Key Words: Assessment, Implementation, Differentiated Instruction

Perceptions Of Teachers And Learners On The Effectiveness Of Civic Education In The Development Of Civic Competency Among Learners In Chipata District, Zambia

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ABSTRACT
The study examined the Perceptions of Teachers and Learners on the Effectiveness of Civic Education in the Development of Civic Competency among Learners in Chipata District, Eastern Province of Zambia. The study employed the descriptive quantitative method. The variables associated with the study were civic knowledge, civic skills and civic disposition. The total number of secondary schools in Chipata is seven (7) with 228 teachers and 7550 pupils. The sample comprised of three secondary schools (one single sex male, one single sex female and one co-educational). Thirty teachers (10 from each school) were selected randomly. One hundred and eighty (180) pupils (60 from each school and 20 from each of grade levels 10-12) were also selected using the simple random sampling technique. A self-constructed structured questionnaire was used for data collection. The questionnaire was face and content validated. A pilot study was carried out in one co-education school in Chipata District using thirty five respondents (5 teachers and 30 pupils). The reliability of the instrument was determined using the Cronbach’s Alpha reliability method. An Alpha reliability coefficient of 0.829 was obtained. Data collected was analysed using the statistical package for Social Science (SPSS). Descriptive statistics was employed. The outcome of the analysis revealed that both teachers and pupils regard civic education as highly effective in the development of learner’s civic competency in terms of civic knowledge, civic skills and civic disposition. The findings of the study therefore revealed that civic education plays a significant role in the political development of the learner. Civic education is an important component of education that cultivates in learners to participate in public life of democracy, to use their rights and to discharge their responsibilities with the necessary knowledge and skills.

Key Words: Perceptions, Effectiveness, Civic Education, Development, Civic competency, Civic knowledge, Civic skills, Civic disposition.

Attitudes of Stakeholders toward the Inclusion and Teaching of Sexuality Education in Ndola Urban Secondary Schools of Copperbelt Province, Zambia

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ABSTRACT
This study investigated the attitudes of stakeholders toward school sexuality education in Ndola Urban District Secondary Schools. The descriptive qualitative research design was adopted for the study. Eight secondary schools, 377 teachers and 5,737 pupils formed the population for the study. The sample for the study consisted of ninety (90) teachers, ninety (90) pupils and ninety (90) parents (with pupils in the schools) who were randomly selected. The instrument used for data collection was a close ended questionnaire of the five point Likert scale designed by the researcher. The instrument was both face and content validated by experts at Solusi University. To test the reliability of the instrument, a pilot study was carried out in two schools in the neighbouring Maserati District using 40 respondents. The reliability of the instrument was determined using the Cronbach’s alpha reliability method and a reliability coefficient of 0.840 was obtained. Data collected was coded and analysed using the Statistical Package for Social Sciences. Descriptive statistics and the one-way analysis of variance were employed for data analysis. The result of the study revealed that the stakeholders (teachers, pupils and parents) in general had positive attitude toward the inclusion of sexuality education in the school curriculum. However, the teachers, pupils and parents had a negative attitude on the inclusion of topics like sexual pleasure and enjoyment, homosexuality as well as premarital sex as topics in the curriculum. There existed significant differences in the attitudes of stakeholders toward the inclusion of sexuality education in the curriculum as well as on the role of sexuality education in adolescent issues as revealed by the analysis of variance. The multiple comparisons showed that there existed significant differences in the attitudes of teachers and parents as well as in the attitudes of pupils and parents as it related to the role of sexuality education in adolescent issues an indication that pupils and teachers were in better agreement than their parents counterparts. In view of the positive attitude of stakeholders toward the inclusion and teaching of sexuality education in the school curriculum coupled with its benefits to adolescent sexual issues, it was recommended that sex education should be compulsory in schools.

Key Words: Attitude, Stakeholders, Sexuality Education

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ABSTRACT

Bullying among teachers merited interest for many reasons. These included its possible detrimental effects on the students, its ability to cause low morale among teachers, a high turnover of trained staff and, poor quality of pupils’ results. This study examined the experience of workplace bullying among teachers in Kuwadzana Cluster, Harare, Zimbabwe. The experiences included verbal workplace bullying, nonverbal workplace bullying, practical workplace bullying and performance related workplace bullying. The survey research design was used for the study. The population for the study was five hundred and twenty six (526) teachers from Kuwadzana Cluster. The sample for the study comprised of one hundred and eighty (180) teachers from both primary and secondary schools. The research instrument for the study was a questionnaire of the five point Likert scale. The questionnaire was face and content validated and reliability was determined using the Cronbach’s Alpha Reliability method. A reliability coefficient of 0.951 was obtained for the instrument. The data collected was analysed using the Statistical Package for Social Sciences (SPSS). The descriptive statistics and regression analysis was used for the analysis of data. The study revealed that teachers were sometimes subjected to belittling remarks about their work or personal life with a mean of 2.5698. On the overall, teachers in Kuwadzana cluster rarely experienced verbal workplace bullying, nonverbal workplace bullying, practical workplace bullying and performance related workplace bullying. Teachers rarely experienced stress and stress related health problems and mental health problems. They, however, experienced low morale as a result of workplace bullying with a mean value of 2.8111. The more qualified the teachers; the more they experienced workplace bullying as indicated by the positive Beta value of 0.623. The experience of workplace bullying accounted for 49.7% variance and had a high effect on the effects of workplace bullying. Based on these findings, recommendations were made.

Key Words: Workplace Bullying, Experience

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ABSTRACT
Despite the growth in research on academic work and outcomes, academic inbreeding (also known as Institutional inbreeding), continues to be an understudied dimension. While its adverse effect on research out puts and promotion are frequently mentioned in reports, speeches, and opinion articles there remains scant empirical research focused on this topic. The literature on academic inbreeding follows two main perspectives: the relationship between academic inbreeding and research productivity, and the intellectual stagnation of inbred faculty associated with limited connectedness outside of the Alma Mater. This study therefore looked at academic inbreeding in Adventist institutions with a view of calling for policies to curtail academic inbreeding as this may be inimical to academic competitiveness among Adventist and other educational training institutions in Africa and beyond.

Key Words: Academic inbreeding, Academic competency, Inbreed, Non-inbreed

Published: Publication by the Conference of Adventism, Society and Sustainable Development (CASSD 2014)
A Survey of External Parasites of Free-Range Chickens and Their Ethno-Veterinary Control Remedies Used By Resource-Limited Farmers in Eastern Cape, South Africa

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ABSTRACT
In most rural areas, chicken infestation with external parasites poses a challenge to their productivity and associated benefits. External parasites cause anaemia, thus reducing growth, egg production and may lead to death. They are mainly controlled by commercial remedies, although resource-limited farmers resort to using alternative remedies which are available and affordable. This study was conducted to document external parasites of free-range chickens and their ethno-veterinary control remedies used by resource-limited farmers. A questionnaire survey was conducted amongst 93 households, 3 of which were herbalists, in Eastern Cape, South Africa. The farmers considered several external parasites to be a problem: mites (79.6%), stick tight fleas (64.5%), lice (10.8%) and ticks (6.5%). Various ethno-veterinary remedies were used to control the parasites, which included ash (28%), madubula (26.7%) and Jeyes fluid (10%) both of which are comprised of 13% carbolic acid, paraffin (8.4%), plants (5.2%), used engine oil (2.8%), dip wash (2.5%), doom spray (d-phenothrin 0.4%), blue death (permethrin 0.03%) (1.9%), diesel (1.9%), smoke 0.9%) and a few (4.2%) used conventional insecticides namely karbadust (carbarly 5%) and mercaptothion (5%). A small proportion (7.5%) does not use either of the remedies. The materials used by resource-limited farmers in controlling parasites were identified and documented.

Key Words: Chickens; control; ethno-veterinary; external parasites; resource-limited farmers

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Alternative Remedies and Approaches Used By Resources-Challenged Farmers in the Management of Cattle Black-Leg Disease in Umzingwane District, Matabeleland South, Zimbabwe

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ABSTRACT
Cattle productivity has been minimized by the occurrence of diseases such as blackleg. This study was conducted to determine and document how resource-challenged farmers of Umzingwane district of Zimbabwe use alternative remedies to manage cattle blackleg cases. Random sampling was used to select 90 beef cattle farmers who were interviewed using a structured questionnaire. Results of the study revealed that cattle owners (86%) reported blackleg disease to be the most important disease followed by ehrlichiosis (23%) and lumpy skin disease (5%). Almost 71% of the respondents reported having experienced cases of blackleg in their herd in the past three years. Few farmers (22%) used conventional vaccines, whereas the majority (78%) used alternative remedies to manage the disease, which included; hot water (80%), hot iron (78%), Potassium permanganate (10%), Ihlwili (60%), Ricinis communis (5%), Pterocarpus angolensis (7%), Sclerocarya birrea (8%), Diospyros mespiliformis (3%), Gardenia spatulifolia (2%). Some of these remedies (P. angolensis, S. birrea, D. mespiliforms, G. spatulifolia) were believed to prevent the occurrence of the diseases, while hot water and hot iron were used for treatment of infected animals. The study revealed that most resource-challenged farmers in Umzingwane district of Zimbabwe used alternative remedies to manage blackleg infections in cattle.

Key Words: Alternative remedies, blackleg, cattle, clostridium chauvoei

Published: International Journal of Livestock Production, 6(6), pp. 97-102, June, 2014
The Impact of Dip tank Rehabilitation on the Occurrence of Ticks and Tick-Borne Diseases in Umzingwane District, Matabeleland South, Zimbabwe

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ABSTRACT

The objective of this study was to determine the impact of dip tank rehabilitation on the prevalence of ticks, tick borne diseases and the other tick related conditions in Umzingwane district of Zimbabwe. Random sampling was used to select 120 cattle farmers and 3 veterinary officers that were interviewed using a structured questionnaire. About 70% of the farmers owned an average of 7 cattle. Before dip tank rehabilitation programme, handling facilities were not intact. Furthermore, there was no footbath, and no roof and head clamp. As a result, all the farmers (100%) reported poor tick control due to the fact that cattle were escaping from the handling facilities before dipping. About 55% of interviewed farmers lost cattle due to tick related conditions such as tick borne diseases (TBD) and teat damage before dip tank rehabilitation resulting in 17% cattle mortality. About 57% cases of tick borne diseases were reported and 70% farmers reported that their cattle suffered from teat and udder damage, abscess and screwworm wounds due to tick infestation. As a result 78% farmers resorted to the use of alternative dipping remedies such as old engine oil (45%), hand spraying (18%), and hand pulling (15%). In 2009/10, the communal dip tanks were rehabilitated by the Stabex 95 programme. All the respondents reported that dip tank rehabilitation improved effective dipping, eased up the carrying of other management activities such as castration, dehorning, vaccination and deworming and improved their herd productivities. In addition, dip tank rehabilitation resulted in reduction of tick infestation (80%), TBDs (75%), abscesses (95%), screwworm infestation (65%), calf mortalities (78%). Furthermore, there was reduction in the expenses in the treatment of TBDs, abscesses and screwworm worm infestations,. The study revealed that dip tank rehabilitation improved cattle productivity.

Key Words: dip tank Rehabilitation; tick borne diseases

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Lecturers’ Written Feedback: What the Students Expect, a Case of Zimbabwe

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ABSTRACT
Feedback is essential to both the instructor and the learners in the education circles. On the part of the learners, it enhances the learning process since the learners are, in Chireshe (2011)’s words, “the primary consumers of the teaching-learning process”, thus it becomes central and important. To this effect, it is the learners who are in the best position to make a judgment on the effectiveness of the feedback they receive from their lecturers. However, there can be a misfit between the instructor’s feedback and what the learners expect to get. This research focused on Solusi University student's response to their lecturers’ written feedback. Interviews and document analysis were used for data collection. Findings revealed that students are in dire need of lecturers’ feedback which they value very much although, at times, they do not understand it. Also, students’ analysed texts showed that lecturers spend considerable time marking and commenting on students’ work, which have, when understood and put into practice, a positive impact on furthering the students’ academic learning.

Key Words: Evaluative feedback, formative feedback, lecturer evaluation, students’ perceptions

ABSTRACT
This research aimed at determining if there is a relationship between teacher personality and pupil performance in Literature in English. The research was conducted using the quantitative design. A population of 37 teachers was used from the Bulawayo Metropolitan district. The 37 teachers were ‘O’ Level Literature in English. The sample used was 10 teachers from the population. A standard personality test and learners’ performance records in Literature in English were used to collect data. Data was analysed using Statistical Package for Social Sciences (SPSS). The research questions were analysed using descriptive and regression analysis. The findings show that pupils’ performance in Literature in English in Bulawayo Metropolitan District is at 65 (90%). The phlegmatic temperament is the most common personality followed by the choleric, the melancholic and the sanguine had the least representation among the Literature in English teachers. The results also showed that there was a positive relationship between teacher personality and pupil performance. It was revealed that 3.8% of the time teacher personality affects pupil performance.

Key Words: Performance, personality, Literature in English

Published: European Scientific Journal July 2014, 10(19)
Exploring the methodologies That English Language Teachers Use to Teach Listening Skills at Secondary Schools

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ABSTRACT

The purpose of the study was to explore the methodologies that English teachers use to teach listening skills and the challenges that teachers face in their use in secondary schools in the Lubombo Region of Swaziland. The study used a qualitative multiple case study as its design. The population was all Junior Secondary English Language teachers in Lubombo region of Swaziland. Five purposively selected junior secondary English teachers were the study’s sample. Semi structured interview, and class observations and document analysis were used to gather data from 5 English teachers sampled from five different secondary schools in the Lubombo Region. The results of this study revealed that there are two major categories of teaching methods that teachers use to teach listening skills in the classroom; teacher training influenced methodologies and communication influenced methodologies. Teacher trained methodologies include; small group discussion, question/answer, lecture and pair work and communication influenced methodologies include drama, role play, interview, and storytelling.

Key Words listening skills, methodologies, English Language

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ABSTRACT

The relevance of internal audit to the challenges they face in their execution of duties in public sector organization in Zambia desires attention. Today’s internal audit activity is a critical consideration in determining the quality of an organization’s internal control and if its development has made great contribution to modern audit practice. Thus, this research is an attempt to providing an insight to the structure of internal auditor’s challenges existing in public institutions and how they affect the job satisfaction and also recommend steps to be taken in reducing these challenges. The three significant challenges public sector internal auditor’s face in their execution of duties include, reporting structure and profession independence, career development and training and non-availability of audit manuals. These challenges really affect their job satisfaction level, that is to say, the higher the challenges faced by internal auditors, the more they are dissatisfied with their jobs. There are strong relationships in the challenges which are faced by internal auditors and their job satisfaction.

Key Words: Internal auditing, job satisfaction, professional independence, internal controls, public sector, internal auditing challenges.

Challenges of Non-Tax Compliance amongst the Small and Medium Enterprises (Smes) In Zimbabwe

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ABSTRACT
Tax plays an important role in economic development and in the growth of Small and Medium Enterprises (SMEs). However, non-tax compliance among SMEs in Zimbabwe is very high. This study was conducted on SMEs in Bulawayo, Gweru and Harare Central Business Districts (CBDs) to establish and rank the factors that encourage non-compliance with tax obligation by SMEs in accordance with the Zimbabwe Tax Regime. The findings were presented in terms of factor loadings, eigenvalues and percentage variances. There were four factors that ranked high as causes for non-tax compliance of SMEs in Bulawayo, CBD are Complexity of the tax systems, norms, economic factors, deterrence to tax evasion and possibilities of tax evasion. It was found that the complexity of the tax system affect non-tax compliance of SMEs to a greater extent followed by norms and economic factors. Possibilities to tax evasion were found to affect non-tax compliance of SMEs to a lesser extent followed by deterrence to tax evasion. In conclusion, there is a great relationship between non-tax compliance of SMEs in Bulawayo and the existing tax system. Norms have a higher relationship with non-tax compliance but it’s lower than that of the tax system. Economic factors also possess a little higher relationship to non-tax compliance but it’s lower than of norms. On the other hand deterrence to tax evasion has the second least relationship to non-tax compliance. Possibilities to tax evasion possess the least relationship to non-tax compliance as compared to the five factors causing non-tax compliance of SMEs.

Key Words: Tax evasion, non-tax compliance, small and medium enterprises, tax system, economic growth.

402. Impact of Information Systems Success Dimensions on Systems Effectiveness: A Case of Sunplus Accounting Package within the Zimbabwe Union Conference of the Seventh-Day Adventist Church

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ABSTRACT
Information systems’ stock has risen with technological advancement. They do not come cheaply and huge amounts of resources are committed towards successful implementation of a system reckoned to bring value to an organisation. It is worthy taking time out to establish the verity of the returns on this investment. This gives an insight into the areas that may need to be reconsidered with regards to the implemented system, while also providing a guide for future implementations. The D & M information systems success model’s dimensions adopted in this study provide a standard with which a systems’ effectiveness can be assessed. The results of this study indicate that the SunPlus Accounting package is delivering satisfactorily across the 5 dimensions of Information quality, system usefulness, system usage, overall satisfaction and service quality. However, the implementation process needs to be revised if users are to benefit from it. The users overall satisfaction is affected to a greater extent by information quality usage, usefulness and service quality perception than by the implementation process or usefulness. As such, for the organisation to realise more from the users, it should pay more attention to these key dimensions.

Key Words: Information systems, systems success dimensions, systems effectiveness, D & M information systems success model.

ABSTRACT
The broad business benefit derived from formal strategic planning by management within the banking sector in Zambia is the realization of revenue opportunities and losses minimization through management ability to recognize future trends and potential operational risks, resulting from adequate environmental scanning strategies. Based on the findings of this study, bank managers strive for a strategic fit between organisational strengths and weaknesses (internal environmental factors) and opportunities and threats (external environmental factors) to achieve profitability, customer satisfaction, increased customer loyalty, market share, sustainable competitive advantage and high retention rates. This study makes an analysis on the micro and macro environmental factors analysis by management in the banking sector of Zambia.

Key Words: environmental scanning, customer satisfaction, customer loyalty, retention rates, competitive advantage

404. Challenges Affecting Academic Performance of Orphans at Schools in Manzini North, Swaziland

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ABSTRACT

This study discussed the challenges faced by orphaned pupils in Manzini North Junior Secondary Schools in Swaziland and how the challenges affected their academic performance. The research design used was descriptive. The target population for the study was all orphaned pupils who sat for the Junior Secondary Education Examination in year 2011 in the Manzini North region in Swaziland. All the ninety orphaned pupils identified in all the eight schools were used for the study. The instrument for the study was a 30 items self-constructed questionnaire of the five point Likert scale. The questionnaire was face and content validated while the reliability was determined using the Cronbach Alpha reliability method. An Alpha reliability coefficient of .872 was obtained. The 2011 results of the orphans in Mathematics, English Language, Siswati and Science were collected and used as measures of academic performance. The data collected were analysed using the descriptive statistics and regression analysis. Findings from the study revealed that orphaned pupils were highly challenged psychologically, motivationally, as well as in food supply and home environment while they moderately have financial and emotional challenges and that they performed poorly in school. The regression analysis showed that 121% of variance in academic performance was accounted for by home environment. It was therefore recommended that the government considered building more institutionalized home setups as there was none presently in Manzini region. This it is hoped will help improve the home environment and food supply for orphaned pupils with subsequent improvement in their academic performance.

Key Words: Academic Performance, Orphaned pupils.

Organisational Orientations and Their Effect on the Practice of Marketing by Non Profit Organisations in Bulawayo, Zimbabwe

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ABSTRACT
The study sought to analyse the practice of marketing by non-profit making organisations in Bulawayo, Zimbabwe. The research employed a descriptive research design. The population comprised all employees of non-profits in the Central Business District of Bulawayo. A quota sample of 106 respondents was employed. A 5 point Likert scale questionnaire was developed by the researcher. A pilot study was conducted to establish the reliability of the instrument and a coefficient of 0.9357 was obtained. Descriptive statistics was used for the analysis of data. Results indicated that non-profit organisations were organisation centred rather than customer centred, lowly practiced strategic marketing planning, conducted some form of segmentation, rarely practiced targeting, or use the elements of the marketing mix, or the marketing controls selected in the study, and did not practice positioning.

Key Words Non-Profit Organisation, Organisational Orientations, Practice of marketing,

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406. Dimensions of Early Childhood Development (ECD) Learner Social Development in Bulawayo East Primary Schools

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ABSTRACT:
The study was conducted to find out the dimensions in Early Childhood Development (ECD) learner social development. The study comprised of a two stage sampling where 10 schools from the 24 in the population were randomly selected. Next was the purposive selection of Grade 0 to Grade 2 teachers. Fifty (50) teachers and 150 pupils were selected. One research instrument was used for teachers. A pilot study was carried out. The research question was analysed using descriptive statistics and factor analysis. Item communalities ranged from .676 to .870 for teacher’s questionnaire. Findings from the research revealed that ECD learners’ social development comprised of learner acceptance of others, learner use of IT, learner emotional development, learner social development, learner interaction with others, learner non-verbal communication development, and learner health lessons.

KEY WORDS: Early Childhood Development, Learner Social Development.

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407. Oral Health Habits: The Case of Solusi University Community

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ABSTRACT

Oral health is one of the most important aspects of total health but it is neglected by most people. Most people only visit the dentist when they have oral health problems. Researches have shown that most diseases like heart diseases emanate from the bacteria found in the mouth. This study therefore sought to learn the oral health habits of people living in the Solusi University Community. The population of the study was all individuals in the Solusi University Community. Convenient sampling was done by visiting homes in the student married quarters and workers in their offices and those who were available filled in the questionnaire. This was a quantitative study using a structured self-constructed questionnaire. Descriptive statistics was used to analyse the data. The findings indicated that most people know that it is necessary to brush teeth frequently and some knew that they needed to floss although a number of them seemed not to know what flossing was. Thirty percent of the respondents stated they only changed their tooth brush when it became necessary and 55% changed their tooth brushes every three months. A number of the respondents had oral problems. It was recommended that the Solusi University Community be educated in oral health care.

Key words: Halitosis, Oral Health, Gum disease

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Occupational Stress among University Lecturers: A Case of Zimbabwe

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ABSTRACT

In this modern technological era, employees, especially lecturers, could be expected to enjoy their work primarily due to the convenience of technology. However, stress levels seem to escalate with this technological advancement creating a plethora of unhealthy lifestyles. The result is that, one of the setbacks encountered in the present day workplace is increased levels of work-related stress which contributes to various problems both for the individual employee experiencing stress and for the organization for which one works. This study aimed at exploring stress levels, symptoms, and common stressors for lecturers at a certain Christian university in Zimbabwe. A modified University and College Union model stress questionnaire was distributed to 36 full-time lecturers at the university. The collected data were analyzed using Statistical Package for Social Sciences (SPSS) Version 16 as well as analysis of variance (ANOVA). Findings revealed that most of Solusi University lecturers are stressed and others exhausted as indicated by a frequency of 50%. The most common stressors were increased workloads, need to hit targets/deadlines, and long working hours, as indicated by the mean scores of 2.6667, 2.6250, and 2.9167 respectively. Lecturers were heterogeneous in their response with regard to increased workload, as shown by a standard deviation of 1.00722. Finally, there was no significant difference in responses when it comes to gender, age, faculty, as well as workload.

Kye words: Occupational stress, Stress symptoms, Stressors, Exhaustion

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The Impact of Dip tank Rehabilitation on the Occurrence of Ticks and Tick-borne Diseases in Umzingwane District, Matabeleland South, Zimbabwe

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ABSTRACT

The objective of this study was to determine the impact of dip tank rehabilitation on the prevalence of ticks, tick borne diseases (TBDs) and other tick related conditions in Umzingwane district of Zimbabwe. About 120 cattle farmers and three veterinary officers were randomly interviewed using a structured questionnaire. Before dip tank rehabilitation programme, 70% of the farmers owned an average of 7 cattle and handling facilities were not intact. Furthermore, they were no footbath, no roof and head clump. As a result, all the farmers reported poor tick control due to the fact that cattle were escaping from the handling facilities before dipping. About 55% farmers lost cattle due to tick related conditions before dip tank rehabilitation resulting in 17% cattle mortality. About 57% cases of tick borne diseases were reported and 70% farmers reported that their cattle suffered from teat and udder damage, abscess and screwworm wounds due to tick infestation. As a result 78% farmers resorted to the use of alternative dipping remedies such as used engine oil (45%), hand spraying (18%), and hand pulling (15%). In the period of 2009/10, the communal dip tanks were rehabilitated by Stabex 95 programme. All the respondents reported that dip tank rehabilitation improved effective dipping, eased up the carrying of other management activities and improved their herd productivity. Also, dip tank rehabilitation resulted in reduction of tick infestation (80%), TBDs (75%), abscesses (95%), screwworm infestation (65%), calf mortalities (78%). Furthermore, about 83% of farmers owned an average of 13 cattle. The study revealed that dip tank rehabilitation improved cattle productivity.

Key Words: acaricide, handling facilities, tick infestation, Stabex 95

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ABSTRACT
This chapter posits that e-Government constitutes a critical context for social and economic development in both developed and developing countries. In addition to leveraging economic development, e-Government also helps to streamline government services to more social based values of inclusion and citizens’ participation, accessibility and power relationship ratios. It is clear from literature that e-Government is not a new phenomenon in most developed countries and some developing countries in Asia and Africa. These countries have already announced their Open Government Initiatives and data portals. However, e-Government leads to greater information asymmetry among citizens and government. There is also institutionalization and diffusion asymmetry of the practice of the current Openness in e-Government models within developing countries in particular. The study presented in this chapter draws on organizational decision-making research and adopts an explorative research approach that is informed by grounded theory. The findings of the research are that the information asymmetry between citizens and government; asymmetry in institutionalization, and diffusion within developed and developing countries are widely attributed to socio-economic and political variations in developed and developing countries. Unless these differences are skillfully identified and accommodated as such into the development and use models, openness in e-Government efforts would not help achieve the social and economic development goals by developing countries in particular.

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Decision Support Systems: An E-Government Strategy to Enhance Human Resources Output In Public Sector Organisations

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ABSTRACT

E-Government is about using the tools and systems, made possible by Information and Communication Technologies (ICTs), such as Decision Support Systems (DSSs) as a strategy to enhance human resources output in public sector organisations. The aim is to provide better public services to citizens and the business sector. ICTs are already widely used by government bodies, especially in developed countries, just as in enterprises. In Zimbabwe, and in many other developing countries, Public Sector Organisations have already started exploiting DSS, unlike the private sector where such systems have been in use for a long time. DSSs have subsequently improved decision making processes in the private sector. Service efficiency and improved effectiveness are the expected benefits of DSSs exploitation alongside increased stakeholder value. This chapter aims to provide the grounds for building an evaluation theory or a framework for assessing DSS adoption and exploitation in the context of public sector and public services provision. It discusses the results of a study that finds that, to a greater extent, decision support systems can be used as an e-Government strategy that will in turn be highly effective in assisting decision making in Public Sector Organisations.

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In this research, the premise is that sharing data according to the guidelines for publishing open government data ensures greater transparency, delivers more efficient public services, and encourages greater public and commercial use and re-use of government information. This logic, drawn from previous literature and past studies, is extended by examining the interplay between economic benefits of e-Government and social considerations in adoption of e-Government models decisions. Drawing on organizational decision-making research, this research argues that, both early and late adopters respond to framing and interpreting adoption decision situations as opportunities, instead of threats, to enhance transparency and accountability. Following interpretivist research conventions methodology, the sampling plan was purposeful and included a total of 39 interviews. It is found that the social, political, and economic context of developing countries may not readily accommodate current models of openness in e-Government. The conclusion drawn in this research is that motivations for the openness in e-Government to appear legitimate coexist with motivations to realize transparency and accountability. These findings prompt rethinking of the classic institutional, framing, and diffusion model, to suggest openness in e-Government model that developing countries could adopt to suit their social and economic context, as a contribution to the body of knowledge.

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Perceptions of Students on Culture and Its Impact on Web-Based Information Seeking At Solusi University in Zimbabwe

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ABSTRACT
The objective of this study was to identify cultural implications and differences through the perceptions of postgraduate students (male and female) at Solusi University, in Zimbabwe and assess the cultural implications and cultural differences` impact on information seeking, management and evaluation in the information environment and information practices, of an institution of higher learning. Literature has shown that there are differences between the success and failure factors in the developed and developing countries with regard to the development and use of Web-based or online information sources for learning purposes in Universities. There is very little literature, and evidence of attention given to this area of study in Zimbabwe in particular. This study is built on the premise that “information seeking” is socio-culturally bounded and that the success of use of Web-based information is highly related to – if not found at, the intersection between the implied by the perceptions of students, that is, information seekers and learners and the technology applied to achieve the desired information search outcomes. The data were collected by use of an instrument of a questionnaire that was administered among postgraduate students at Solusi University, in Zimbabwe, in 2011. The data were analysed quantitatively with SPSS version17.0 for Windows using mainly cross-tabulations and Chi-squared tests. The statistically significant differences focused on the general Web-based information seeking, management and evaluation in this information environment, and information practices used within the Solusi University. The conclusions drawn from the study were that cultural differences and implications influence the seeking of Web-based learning information and that the impact of cultural differences and implications should be examined more thoroughly in future studies, which should apply both qualitative and quantitative methods.

Key Words: information seeking, management and evaluation, Web-based or online, cultural differences, cultural implications

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ABSTRACT
The purpose of this study is to evaluate whether there is a correlation between the intellectual capital of employees, i.e. top managers (the agent) and the shareholder (the principal) value growth among Zimbabwean companies, listed on the Zimbabwe Stock Exchange. By using these results the aim is to further examine a possible indicator for leveraging the efficiency of intellectual capital in a developing economy as a lesson. In order to perform this investigation, intellectual capital and shareholder value are quantified with, respectively, value added per employee and share price value per employee. These measurements are gathered from 17 Zimbabwean listed companies, divided into five industry sectors, that is, services, manufacturing, agriculture, mining and information technology, and tested statistically in order to find a relationship. This means, according to the researcher`s propositions on the return on intellectual capital, that there also is a correlation between intellectual capital and shareholder value growth. In order to provide an indicator for improving companies` intellectual capital, a statistical examination concerning the relationship between the Intellectual Capital Multiplier (IC Multiplier) and value added is also performed. This examination shows that there is a strong correlation between the IC Multiplier and value added, value added can to a degree of 84 percent be predicted by the IC Multiplier, and that working with the ratio between structural and human capital is an excellent method for companies in developing economies to increase their intellectual capital. In conclusion it can be said that most companies in this investigation show moderately low values regarding the IC Multiplier, leading to an erosion of the companies` human capital. In order to become more stable and lower the degree of risk, these companies must improve their IC Multiplier. What this study demonstrates is that an improvement of the IC Multiplier also will have an extensive effect on the company`s shareholder value growth.

Key Words: intellectual capital, value added per employee, structural capital, human capital, IC multiplier, shareholder value growth

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Performance Implications of Information Systems Strategy Planning Within Zimbabwean Firms: A Context Approach

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ABSTRACT
Context consideration in Information Systems Strategic Planning has been premised as very important by several studies conducted in this area. However, there has not been systematic incorporation of contextual factors and the categorization of factors has not been made explicit and some factors have only been superficially examined. This study sought to examine the interrelationships amongst four domains of context and considered their influence on Information Systems Strategic Planning. The study also examined the corresponding impact of planning on business performance. For the purposes of this study, data was collected from 113 Zimbabwean companies and results revealed that the internal Information Systems context mediated the effects of environmental and organisational level variables on Information Systems Strategic Planning practice. The results further showed that Information Systems planning intensity and degree of integration with business planning was strongly influenced by managerial planning expertise, and had positive effects on business management’s commitment to Information Systems as well as on Information Systems contribution to business overall performance. Results have important implications in organisational Information Systems Strategic planning and overall organisational performance.

Key Words: information systems strategic planning, context, environment, strategy, planning expertise, commitment

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ABSTRACT
The primary objective of Workers’ Compensation Rehabilitation Centre is to provide clinical rehabilitation services to patients who have work related injuries. To do this, the centre requires complete rehabilitees’ data to be transmitted from the referrer to the centre as well as across internal departments for the centre. This is because documentation of medical records is a fundamental tool for communication between health professionals. It informs the care provided, treatment, care planned and the outcome of that care as a continuous and contemporaneous record. However, the researcher was not aware of any clinical audit of documented rehabilitees’ data with respect to compliance with this requirement. This prompted a review of rehabilitees’ data for its completeness as a vital initial step towards optimisation of rehabilitees’ care pathways. The research method was a non-participatory document review of quota sampled discharged rehabilitees’ files using a descriptive and analytical research design. Data were captured using a structured data collection instrument designed and tested by the experts in the medical fraternity. The instrument was designed from information prescribed in internationally referred documents and refined using information prescribed in the Procedures Manual for the centre. Generally, rehabilitees’ information was incomplete thereby making the referral and review of patients difficult. Clinical template forms in use at the research site had inadequate form fields and this was an important factor which modelled the level of completeness of rehabilitees’ information. These inadequate form fields resulted in important facts about the rehabilitees not efficiently transmitted across departments so much that there was practically no meaningful documented dialogue on balancing benefits with the risks to patients. There is need to revise the content of the procedure manual to prescribe that all clinicians file complete discharge rehabilitees’ information in one folder as part of improving documentation in line with the principle of medical care and international standards.

Key Words: documented rehabilitees’ data, clinical audit, workers’ compensation, procedure manual, clinical rehabilitation, data completeness

417. Stakeholders Perception of Socio-Economic Benefits of Rural Electrification Programme in Zimbabwe: A Case of Umzingwane District

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ABSTRACT

The government of Zimbabwe has embarked on the Rural Electrification Programme from 1989. The programme’s objectives are to stimulate socio-economic development in rural areas of Zimbabwe through the provision of access to electricity; to raise the standards of living of rural people through the delivery of enhanced social services in health, education and income generation projects. There is strong belief that the programme will help reverse rural to urban migration. To evaluate the stakeholders’ perception of socio-economic benefits of the programme the study employed a quantitative descriptive approach. Descriptive statistics and stepwise regression analysis were applied to draw relationship between variables understudy. A self-distributed questionnaire based on a Likert scale of 1-5 was administered to investigate the stakeholders’ perception of the benefits of the rural electrification programme in the Umzingwane District for the period 2005 – 2010. A prior or pilot study was conducted to establish the reliability of the instrument and a coefficient of 0.742 was obtained. Data was analysed with the aid of the Statistical Package for Social Sciences (SPSS). Different classes of respondents had different perceptions on the benefits of the Rural Electrification Programme. Mostly literate respondents perceived that Rural Electrification Programme brought more benefits on service delivery especially on health, communication and human resources retention, while the illiterate, who comprised mainly the villagers, perceived that the Rural Electrification Programme did not bring much of benefits to them.

Key Words: rural electrification programme, socio-economic benefit, income generation projects, social services

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ABSTRACT
The increased usage of computer based decision support systems is perceived as transferring decision authority to software programs. This has led to the notion that decision making power has been somewhat transferred from human decision makers and over centralized on the machine in the decision loop. The question is, has this enhanced the effectiveness of the decision support system in selected Universities in Zimbabwe? The findings of this study are that, to a great extent decision support systems are effective in assisting decision making in organisations. Responses from management were concentrated on the higher positive side showing that they agreed that most of the human resource elements were improved by use of the decision support systems. It was recognized that the older the respondent the quicker they solve problems and accurate data collection was found to increase the decision scope.

Key Words: decision support system; decision making; decision scope; decision loop; decision authority

ABSTRACT
This study used a combination of quantitative and qualitative designs so as to gain a deeper insight on strategies used to achieve performance goals (shareholder value growth) in selected hotels in Zimbabwe. A self-administered questionnaire was used to gather primary research data which was analysed by the Statistical Package of Social Sciences (SPSS). The research findings were that all hotels use the financial, customer satisfaction, internal business processes, and innovation and learning strategies in order to achieve shareholder value growth. Apart from customer satisfaction, in which Hotel Group 3 recorded the highest mean of 4.5714 and Hotel Group 4 the lowest mean of 3.6667, the research has proved that generally all hotels apply the financial ad non-financial strategies in the same measure. The PE ratio was perceived to have performed superior with a mean of 3.7333 and standard deviation of 1.07146. EPS and dividend yield ratios also performed well with means of 3.7167 and 3.6500 respectively and standard deviations of 1.02662 and 1.03866 respectively. EPS is mostly driven by internal business process strategy as indicated by a significant correlation of .689 and to a lesser extent by financial strategy which had a correlation of .413. PE ratio had a significant correlation of .599 with internal business process strategy and a weaker correlation of .313 was recorded in financial strategy. Dividend yield growth, on the other hand, recorded a strong correlation of .553 with customer satisfaction strategy and a weaker correlation of .460 was noted with innovation and learning strategy. On the whole, the strongest correlation was found to be with internal business process strategy with an average mean of .611, followed by customer satisfaction strategy with a mean of .567, innovation and learning strategy .499 and finally financial strategy with the least average correlation of .407. EPS was affected by international business process strategy (46.5%) and customer satisfaction strategy (10.3%). Internal business process strategy had a 34.8% effect on PE ratio growth and dividend yield growth was affected by two factors, customer satisfaction strategy and financial strategy which contributed 29.4% and 12.2% respectively. The study revealed that, there is a relationship between hotel performance and strategies employed. Internal business process and customer satisfaction strategy had a bearing on the performance of the Earnings per Share (EPS), while dividend yield growth ratio was affected by customer satisfaction and financial strategies. On the other hand the Price Earnings ratio (PE) was affected by one factor only: internal business process strategy. Overall, internal business process strategy has been proven to have the strongest relationship while financial strategy has the weakest relationship.
**Key Words:** shareholder value growth, earnings per share, financial strategies, non-financial strategies, price-earnings ratio, share price

This paper sought to assess the extent to which NGOs in Zimbabwe apply internal controls in their operations. The researcher used descriptive quantitative design. Data was collected using a self-developed questionnaire that was subjected to expert evaluation for content validity. A pilot study of 20 NGOs was then conducted and it indicated an overall reliability of 0.864. A simple random sampling technique was used to select the 50 NGOs (unit of study). Data was analysed using the Statistical Packages for Social Sciences (SPSS). One-sample statistics and one-sample test were used to assess the frequency of application of internal controls by selected NGOs in Zimbabwe, and the hypotheses were tested at 0.05 significance level. The findings of the study were that, NGOs in Zimbabwe have a sound internal controls system overall in terms of the control environment, controls procedures and monitoring controls. The human resource aspect of the internal control was found to be applied inconsistently from organisation to organisation. Most of the NGOs respondents indicated that their organisations were operating under well constituted boards, qualified and experienced management. The human resources aspect of internal control amongst the NGOs requires a further study or studies in the future.

Key Words: internal controls, organisational operations, control environment, fraud, malpractices, nongovernmental organisations

Socio-Cultural Implications for the User-Perceptions of E-Learning in Universities in a Developing Country: A Grounded Theory Approach

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ABSTRACT

This study is an exploration research into the socio-cultural implications for the user-perceptions of e-Learning. Literature has shown that there are differences between the success and failure factors in the developed and developing countries with regard to the development and use of e-Learning in Universities. The researcher uses Grounded Theory as a methodology for Theory Generation of the socio-cultural implications for the user-perceptions of e-Learning and aims at the promotion of e-learning by identifying key factors for the development and adoption of e-Learning contents and technology infrastructure applied in the different socio-cultural University environments in Zimbabwe. This study is built on the premise that “learn ability” is socio-culturally bounded and that the success of e-learning is highly related to – if not found at, the intersection between the implied by the perceptions of users, that is, learners and educators and the technology applied to achieve the desired learning outcomes. There is very little literature, and evidence of attention given to this area of study in Zimbabwe in particular. It is there for an attempt of this study to provide evidence of socio-cultural implications to content designers and developers as well as learners themselves — with emphasis in one of the less active in e-learning regions of Africa, so as to enable them to address e-learning contents and technology infrastructure applied from a-relevant-to-the-learner and educator point of view, enhancing therefore the potential for e-learning up taking. Based on this view the researcher constructed a model or theory for Socio-Cultural Based e-learning or online design consisting of 23 steps. In terms of this model, step 1, refers to the socio-cultural implications external to organizational context, step 2, refers to those internal to organisational context, steps 3 to 11, to individual and collective perceptions or cognition, and steps 12 to 23 to “learn ability”, that is, user satisfaction. However, the results of this study, based on Grounded theory as a methodology indicate that socio-cultural aspects cannot be neglected when dealing with education, and it is true also for technology-based education.

Key Words: socio-cultural, user-perceptions, implications, e-learning, grounded theory


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ABSTRACT

The increase in computer crime has led to scepticism about the move made by the banks to introduce on-line banking. Some view this as a noble move which has made the banking system more efficient, reliable and secure, while others view it as a risky and insecure way of banking. The aim of this study was to assess whether on-line banking in the developing countries is secure or not. The researcher chose a descriptive-quantitative research design. Data was collected using a self-constructed questionnaire. Convenience sampling and stratified random sampling techniques were used to select the main subjects of the study. Generally on average there was no significant difference between the perceptions of management bank personnel and non-management bank personnel on the security of on-line banking. The study recommends further future studies on the security of on-line banking in developing countries based on the perceptions of the customers themselves, who are using on-line banking services, the Common Criteria for Information Technology Security and also a study of the latent dimensions of on-line banking security as extracted by factor analysis, how they differ from elements of information security as derived from the theoretical framework and literature.

Key Words: on-line banking; on-line banking security; information security; network services; banking system

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Plant Breeding

423. Breeding For Higher Yield in Tobacco

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ABSTRACT
The achievement of higher yields remains one of the primary objectives of variety development programmes. However, breeding for high yield is a difficult task as traits contributing to yield are many and intricate. Drought tolerance is one of most important abiotic constraint that limits yield. In this study, 18 superior breeding lines previously selected on the basis of acceptability of type, high yield potential, good curing styles and multiple disease resistance and five popular cultivars were tested for their germination ability under osmotic stress using a series of concentration of polyethylene glycol (0%, 15%, 22.5% and 30%) at two temperatures levels (20°C and 30°C). The results showed that the selections had good potential and significantly better germination ability under restrictive conditions than the popular cultivars. There is evidence that high germination ability under heat and osmotic stress correlates with drought tolerance. Droughting experiments for these breeding lines are underway in a controlled environment and will also be conducted in the field in the subsequent year. Identified drought tolerant genotypes will be used in the development of drought tolerant varieties, a necessity in the face of climate change.
Breeding For PVY Resistance in Burley and Flue-Cured Tobacco

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ABSTRACT
Potato Virus Y is a virus disease that had not been previously of economic importance in tobacco production due to the cultural practises and legislative control recommended by the Tobacco Research Board and practised by growers for decades. However, lately the non-adherence to legislated dead periods, late planting and tight or non-existent rotations have led to resurgence of aphids and the viruses they transmit. Management options are focussed on eliminating the disease vectors as there are no curative treatments available once the disease establishes. Breeding for resistance remains a cost effective management option. In this study, two and three ways crosses were made between popular flue-cured and burley parentals and the respective resistant lines (TB4 –flue-cured and TN90 burley) and also in an intercross manner. The diverse lines generated were sap inoculated with PVY on each generation. Thereafter, disease strain and severity assessment were performed before the lines were advanced either by the pedigree method or by the backcrossing method for recessive traits to the sixth cycle. Molecular phenotyping of sixth cycle plants using primer sets flanking genes though to be mediate resistance was also done. Three independent lines (two flue-cured type and one line intermediate between flue-cured and burley) showing complete immunity from endemic PVY strains were discovered at the sixth cycle. Molecular phenotyping performed indicated that PVY resistance might be mediated by the absence or mutated form of the ELF4 gene involved in protein translation. The identification of ELF4 represents an expeditious route to breeding for PVY resistance as it can be used as a marker to aid selections practised in the field.
Breeding For Resistance to Pythium Spp in Flue-Cured and Burley Tobacco

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ABSTRACT

Pythium root rot of tobacco seedlings is a major challenge in the float seedling production system. Chemical control with fungicides such as Ridomil (metalaxyl) and No-blite (fenamidone / mancozeb) are currently recommended. However, the costs of the fungicides can be prohibitive and repeated use can result in the development of resistance by the pathogen. It is therefore, desirable to have cultivars that are tolerant or resistant to Pythium root rots, to minimize pesticide usage. In this trial four lines with varying levels of resistance were crossed to popular hybrid parentals creating a total of 193 F1 hybrids. Several seasons of Pythium testing based on seedling survival and severity of infection resulted in 23 selections being chosen as promising. Further, disease tests revealed that these 23 selections had no sufficient utilisable resistance/tolerance. The programme is on-going but has been expanded to screen wide germplasm (landraces, primitive and wild relatives of tobacco and old cultivars) for potential utilisable resistance.
Breeding For Short Season Tobacco Varieties

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ABSTRACT
Weather information available from the Meteorological office of Zimbabwe and other sources support the view that there are noticeable changes in the climactic patterns prevailing in Zimbabwe. Such changes have largely been characterized by the late onset of the rains and generally shorter seasons. Most of the tobacco cultivars in Zimbabwe have been bred to give high yields in long agricultural seasons with adequate rain. The objective for this study is therefore to develop short season varieties that have wide adaptability in different agro-ecological environments and can also fit the current short seasons. Currently, the identification of parentals that fit the ideotype: Less number of days to topping (early maturing), produce at least 20-25 leaves before flowering, moderate ripening rate, good holding capability in the field, rapid dry matter accumulation and at least a yield potential of 2.5 tonnes are being evaluated. A full diallel cross will be initiated to produce hybrids that will be evaluated in marginal and low rainfall areas.
Alternative Uses Of Tobacco: The Search for High Nicotine Content Types

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ABSTRACT
Nicotine and nicotine derivative compounds are important in the pharmaceutical and chemical industries. However, the Zimbabwean tobacco crop is mostly produced for export worldwide for the manufacturing of cigarettes. The push to ban smoking worldwide has led to the development of alternatives to cigarettes that include electronic cigarettes, which require nicotine. However, when using nicotine in the pure form it is ideal to have plants that accumulate high levels of nicotine to ensure productivity. Zimbabwe tobacco cultivars having been bred for the traditional market have low nicotine content (3.0-3.2 % of the total dry matter). The objective for this study is to screen and select tobacco types with high nicotine content (> 8%) that can be used for nicotine extraction for use in commercial applications.
428. Alternative Uses of Tobacco; Extraction and Quantification of Solanesol in Popular Flue-Cured Tobacco Varieties

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**ABSTRACT**

Solanesol is a compound of high medical importance. It is utilized in the synthesis of metabolically active quinones, Coenzyme Q10 and vitamin K analogs which are important as coagulants, antiulcer, energy drinks, for the prevention of osteoporosis and as hypertension treating agent. It has been reported that medical demand for Coenzyme Q10 outstrips supply and prices of up to $US 5000 per kg are uncommon. Tobacco is a rich source of solanesol. The objective of this study is to develop protocols to extract and quantify high purity solanesol in tobacco using low cost equipment available in the country. Additionally the solanesol yields for the different cultivars will be determined from plants at different developmental stages.
Creating Utilisable Genetic Diversity Through Mutagenesis: The Start Of Forward And Reverse Genetics Approaches At Kutsaga

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ABSTRACT

The Plant Breeding program at Kutsaga is renowned for its excellence in tobacco variety improvement. However, such success is also associated with reduction in genetic diversity as breeders increasingly focus on improving the so-called “elite” cultivars. Therefore there is need for a concerted effort for genetic diversity creation. One approach is to create this much needed diversity by a mutagenesis approach. This study aims to create a high quality (broad range) mutant library with wide genetic diversity from which future breeding efforts can derive variability and useful traits. It is hoped that a library of selections with genetically strong and visible characters such as high leaf potential, leaf shape and length (yield), suckering habit, plant architecture (compact plant, leaf inclination), colour etc. will be catalogued. Also, once investment into equipment such sequencing platforms (CE-SSCP) and high throughput assays (LC/MS), macromolecular composition and quantity of bioactive compounds such as nornicotine, nicotine, NNN, lipids, solanesol that are all quality characters that cannot be scored in the field can be rapidly screened within the developed mutant library. Additionally, fascinating basic science on gene functions and associated phenotypes will be possible using forward and reverse genetics approaches.
Spinning Tobacco Stalks into Gold

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ABSTRACT
Tobacco stalks represent a type of abundant renewable resource, with estimated 240 000 tonnes produced per year; and are currently considered agricultural waste since they have very little use in Zimbabwe. The mounting pressure to ban tobacco consumption worldwide will have huge negative impacts particularly on the Zimbabwean economy; especially if imposed without adopting alternative uses or crops as productive and profitable as tobacco. In this article, we explore ways, in which tobacco stalks could be commodified, identify possible uses and respective technologies that could be utilised to make profitable products within the Zimbabwean context. The proposed uses of tobacco stalks considered herein represent an approach that could be adopted to enhance tobacco production in Zimbabwe as well as add value to a product that would otherwise continue to be considered as a waste material. This paper proposes ways in which Zimbabwe could continue to grow tobacco even if a complete smoking ban is effected and even in the absence of that, the use of tobacco stalks in the suggested manner constitutes value addition and beneficiation.
Cooperative Cultivar Trial of Burley Varieties

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ABSTRACT
There has been renewed interest in locally produced root-knot nematode resistant burley tobacco varieties in the region. This is an opportunity for the Tobacco Research Board and the country to promote its existing burley varieties and embark on further burley variety improvement programs. This project aims to increase the number of root-knot resistant commercial burley varieties on the regional market by the reintroduction of some promising root-knot resistant material. Four established (B102, B RK2, B RK4, B RK5) and three promising (SgMD5-14-3-2-3B, CgSgMB5-18-2-2B, SgSDDX4-1-1-5) burley breeding material with multiple disease resistance will be evaluated for agronomic performance and curing quality.
432. Breeding For Combined Resistance to Root-Knot Nematodes and Tobacco Mosaic Virus in Dark Fire Tobacco

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ABSTRACT
Due to renewed interest in Dark Tobacco, a programme to improve the disease resistance of available varieties was initiated. After selecting for suitability and coming up with three morphologically acceptable lines, a breeding program was started to incorporate resistance to root-knot nematode and Tobacco Mosaic Virus into some of the commercially acceptable dark-fire cured cultivars. Backcross 5 (BC5) plant selections were developed in the 2014/15 season. The objective of this experiment is to evaluate the BC5 material and select resistant plants for establishing the BC6 generation.
ABSTRACT
Hybrid seed yield is affected by time of planting, moisture management as well as fertility management in tobacco. In the past, there has been no effort to investigate the maximum potential seed yield of tobacco varieties under optimum field management conditions. With the increasing need for efficiency and judicious use of resources, there is need to investigate the potential seed yield obtainable from each hybrid so as to maximum returns. An experiment was set up at Kutsaga Research Station incorporating five sets of parental lines to study the hybrid seed yield potential of the female parents under intensive management.
ABSTRACT
Early variety development is carried out under the management of the breeder usually on station but eventually the varieties developed, are used by the farmers under different growing conditions. It is therefore very important that after the breeder has selected some lines, these are evaluated on farm, in areas where the varieties will eventually be grown. The objective of this experiment is to evaluate the agronomic performance of 15 tobacco varieties in all the three established tobacco growing regions of Zimbabwe, namely the fast, medium and slow growing areas.
Introducing Root-Knot Nematode Resistance to Bw9

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ABSTRACT
BW9 is the pollen parent of the popular burley tobacco variety B RK4. Its advantage lies in that it has resistance to wild fire races 1 & 2 and angular leaf spot which are a problem in the some burley growing areas such as Chipinge. However, BW9 is susceptible to root-knot nematodes and this makes it difficult for it to stay in the field for long periods required for the production of high volumes of pollen required in hybrid tobacco seed production. The objective of this experiment is to incorporate root-knot nematode resistance in BW9 using the backcross breeding method from the established burley line JH5.
ABSTRACT
Tobacco variety development is undertaken to develop varieties with broad adaptation and resistance to commonly occurring tobacco diseases and with the potential to be grown in any part of the world. It is therefore very important to assess the progress of local breeding efforts relative to achievements made by other breeders across the world. The objective of this experiment is to evaluate the relative performance of exotic varieties under local field conditions on station.
437. An Investigation into the Relationship between Cured Leaf Quality and Heterozygosity or Homozygosity in TMV Resistant Hybrids

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ABSTRACT

Most of the Tobacco mosaic virus (TMV) resistant hybrids have been developed with the single dose TMV genes. There is however a need to have TMV resistance in both parents to guarantee disease prevention and high plant productivity. However, in the USA use of double dose TMV resistance has been reported to negatively affect the quality of the cured leaf although. This has not been confirmed locally. The objective of this study therefore is to investigate the effects of double dose TMV resistance on the quality of cured tobacco leaf under Zimbabwe conditions.
438. Breeding for Multiple Disease Resistance in Dark Tobacco in Zimbabwe

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ABSTRACT
The Tobacco Research Board’s breeding program benefits not only Zimbabwean growers but also those in the entire Southern Africa region. In the recent past (2010 – 2011) there has been renewed interest in the growing of dark fire tobacco among the regional smallholder growers and thus an increase in the demand for high yielding, multi-disease resistant and superior quality varieties. Most of the dark fire varieties available in the Tobacco Research Board’s germplasm bank (Western 86, CDL28, DRV1, DRV7 and DRV10) were however susceptible to Tobacco Mosaic Virus, root-knot nematodes (M. javanica) and alternaria leaf spot (Alternaria alternata). Thus, a breeding program aimed at developing varieties with resistance to the three diseases was initiated. Trials were conducted from 2011 and a dark fire tobacco variety DACR3-6-18 with resistances to all three was used as a source of resistance. Data on fertilizer requirements, plant spacing and cured leaf chemistry on the hybrids was also collected. Results showed that four of the hybrids, developed KDAC 008, KDFC 010, KDFC 070 and KDFC 86 had the three resistance traits and acceptable morphology. Nicotine content for the four hybrids was also acceptable ranging from 4.5 to 5.5 % DM.
ABSTRACT

Alternaria leaf spot caused by the fungus *Alternaria alternata* and Frog eye leaf spot caused by *Cercospora nicotianae* are economically important foliar diseases of tobacco (*Nicotiana tabacum*). They both occur on ripening, mature tobacco leaves causing significant reductions in yield and quality of the cured leaf. An experiment was conducted to investigate the susceptibility of newly developed tobacco hybrids. Results showed significant differences (p < 0.05) among the varieties for resistance to Alternaria leaf spot but no significant differences (p > 0.05) for frog eye leaf spot. The hybrid T60 and experimental line K326 showed the highest resistance to ALS (score of 1.6) and frog eye leaf spot (score of 1.3), respectively. All the other varieties, however, had comparable disease resistance levels to the control variety K RK26. It is concluded that either one or both parental(s) for T60 are resistant to Alternaria leaf spot. The parent K 326R was found to be the source of resistance to frog eye spot. Future breeding programs for these diseases could utilize these two sources of resistance to develop lines with both resistances at elevated levels.
ABSTRACT
In the float seedling production system, water moves up by capillary action from the water pond to the surface where it evaporates. Salts that accumulate after evaporation cause injury of plants. An experiment was carried out at Kutsaga Research Station in Harare to evaluate grass mulch for the control of salt injury. Vlei grass mulch was applied on experimental plots at 0 kg/ m² (0 % mulch), 0.58 kg/ m² (50 % mulch), 1.16 kg/ m² (100 % mulch) and 1.74 kg/ m² (150 % mulch) in two seasons; 2012 and 2013 in July and in August. Germination percentage, survival counts and seedling damage assessments were measured at 7, 21 and 28 days after sowing (d.a.s). The results showed that grass mulch at the rate of 1.16 kg/ m² (100 % mulch) is required for salt injury control in the floatbed.
Remote Sensing: A New Tool For Confirming Tobacco Legislated Dates Compliance In Zimbabwe

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ABSTRACT

Insect pests and diseases pose major challenges in tobacco production in Zimbabwe. Among control strategies is the use of legislated tobacco sowing, planting and stalk destruction dates. Physical monitoring, while effective requires high staff and travelling costs, hence the need for an effective and accurate monitoring method. Remote sensing can provide a reliable, fast and accurate means of monitoring tobacco plantings and stalk destruction. This study sought to evaluate three instruments most commonly used in vegetative monitoring Landsat 7, Moderate Resolution Spectro-Radiometer (MODIS) and Multispectral Radiometer (MSR 5) for delineating tobacco fields with stalks still standing past the stalk destruction date, fields where transplanting had been done prematurely and fields where strict adherence to legislative dates had been observed. Significant differences (P<0.001) were noted between NDVI in fields where stalk destruction was done according to legislation and where this was ignored. Significant differences (P<0.001) were also noted between compliant and non-compliant tobacco fields between 1 August and 1 September using the T-test mean separation technique. The study concluded that reliable monitoring of legislative date compliance can be achieved through remote sensing.
ABSTRACT

Yield estimation in flue-cured tobacco production is essential for effective marketing in Zimbabwe as it enables adequate planning and preparation for the expected leaf volumes for merchants, processors and exporters thus ensuring competitive prices for growers. Traditionally, yield estimates have been done using the Gavin method developed in 1984 which is based on an assessment of in-season development of tobacco variables such as leaf length, width, plant height and dry mass using destructive sampling techniques. The objective of this research was to develop quick and non-destructive methods of obtaining tobacco crop variables using ground-based sensors such as the Multispectral Radiometer (MSR 5). The results showed a positive linear relationship between Moderate Resolution Imaging Spectroradiometer (MODIS) and MSR 5 derived NDVI’s that was sufficient for estimating tobacco crop variables and yield estimates. Five models for estimating leaf length, width, plant height, Geometric mean area and plant height from NDVI obtained from MODIS and MSR 5 were developed. These models can be used to remotely determine factors that influence yield areas to enable more accurate yield estimation.
The Relationship between Ground Based Multi-Spectral Radiometer Sensor Derived Ndvi and Agronomic Variables of Flue-Cured Tobacco for In-Season Crop Monitoring

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ABSTRACT

In-season tobacco crop status monitoring is used to evaluate the effect of cultural practices and environmental interactions that ultimately determine crop yield. In this experiment, the relationship between hand-held Multispectral Radiometer (MSR 5) derived Normalized Difference Vegetation Index (NDVI) and tobacco biophysical parameters were established. From 100 Ha of tobacco crop, sampling sites were randomly selected for reflectance measurements and corresponding leaf length, leaf width, plant height, leaf number counts and above ground biomass. The biophysical parameters data was collected for 12 weeks from the age of 1 week after planting. The coefficients of determination between NDVI and leaf number (R² = 0.88), leaf length (R² = 0.89), leaf width (0.82), plant height (0.86), Geometric mean length (0.863) and above ground dry mass (0.888) were high enough to allow for accurate assessment of crop health using NDVI. In-field variations in crop parameters were also observed on tobacco planted on different dates. Crop biophysical parameters are, hence, positively related to NDVI, and these results can be used in making in-season assessment of tobacco crop health, growth vigor and hence in yield estimation. Key Words: Crop status monitoring, normalized difference, vegetation index, crop biophysical parameters, yield estimation
Development of Mathematical Models for Estimating Tobacco Crop Biophysical Parameters Using Multispectral Radiometer and Upscaled Modis Derived Ndvi

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ABSTRACT

Research on assessing flue-cured tobacco canopy response to cultural management using remote sensing was done using the multispectral radiometer (MSR 5) derived NDVI. MODIS satellite platforms provide adequate spatial resolution for large scale crop assessments but have a low spectral resolution and are susceptible to atmospheric interference. This experiment sought to develop estimation models for flue-cured tobacco agronomic parameters based on established relationships with MSR 5 and MODIS derived NDVI and field measured agronomic parameters. MSR 5 and MODIS reflectance readings were collected weekly from six tobacco fields, between 1 and 12 weeks after planting. Satellite data was ordered from the USGS Glovis Website using the Earth Explorer interface to identify the experimental fields. The linear models for estimating biophysical parameters like leaf length, leaf width, plant height, leaf number and geometric mean leaf area were developed. Using a simple function relating MSR 5 and MODIS derived NDVI, and by substitution of NDVIMSR with the NDVIMOD, the estimation models for the tobacco biophysical plant parameters were also derived. The results from the study can improve the accuracy of tobacco crop monitoring and vigor assessment on a large scale. Key Words: multispectral radiometer, satellite platforms, spatial resolution, biophysical parameters, crop monitoring
Crop Productivity Services

445. Fertilizer Management in Tobacco Seed Crops

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ABSTRACT
Fertilizer recommendations for seed production have been based on those developed for the production of leaf crops. The objective of the trial is to determine the effect of different fertilizer levels and application times on seed yield. Both basal and top dressing fertilizer combinations are being tested. Results so far indicate that increased fertilizer rates improve seed yield.
Effects of Pollen Dilution on Tobacco Seed Yield and Quality

C. Chibudu

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ABSTRACT
Tobacco hybrid seed production can be hampered by pollen shortages due to harsh environmental conditions or non-synchronized anthesis and stigma receptivity from seed parents. Moreover, normal pollen concentrations are wasteful and require large areas of land for pollen parents, thereby increasing production costs. There is need to dilute pollen to improve pollen use efficiency as excess pollen is currently used. The objective of the study was to ascertain the effect of pollen dilution of some hybrid parents on seed yield and quality and to identify the optimum pollen dilution ratio. Pollen was diluted with Talc (Silicate of Magnesium) by volume to give five treatments; 25, 50 75, 85 and 100% pollen (Control). Results so far suggest that 50, 75, 85% pollen dilution treatments were optimal. Seed yield and quality is also similar as when using undiluted pollen.
447. Effect of Planting Date on Seed Yield

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ABSTRACT
Late planting of maternal parents may result in low seed yield because of bushy top and other virus diseases which are prevalent in December and January. The aim of the study was to examine the effect of planting date on seed yield and quality for some Kutsaga varieties. Two hybrid parents were planted in September, October and November. Results showed that the total seed yield decreased by 31% when planting was delayed from September to October and by 79% when delayed to November. Therefore, it was concluded that September is the most ideal date for planting parentals for seed production.
Use of Ethephon in Enhancing Ripening In Leaf Tobacco

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ABSTRACT
The rate of tobacco ripening affects the yield and quality of the crop. In heavily textured soils, nitrogen is in abundant supply and therefore leaf ripening is slow. In such soils, there is need to use an ethylene based ripening agent to prevent leaf disintegration or rotting. Also, in cold environments, such as towards the end of the growing season, tobacco tends to ripen at a slower rate and hence the need to hasten ripening. Moreover, tobacco legislation requires farmers to destroy tobacco stalks by the 15th of May every year. Therefore, to abide by this legislation, ethylene based products can be used to accelerate ripening as well as to reduce the time required for curing the leaf in the barn. The objectives of this trial are therefore to evaluate the response of selected flue-cured tobacco varieties to different ethylene application rates and to establish the optimum time of application.

Key Words: leaf ripening, ethylene, leaf quality, curing, flue-cured varieties
Use of High Analysis Slow Release Fertilizers in Tobacco Production

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ABSTRACT
As part of recent developments in soil fertility management, compound fertilizers with nitrogen protected by a complex bio-organic coating that ensures controlled and sustained release have been introduced. The slow release of nitrogen minimizes leaching losses, thus negating the need for additional nitrogen side dressing and reducing transport and labour costs for the grower. The objective of this trial was to evaluate the effect of a nitrogen slow release compound fertilizer on tobacco growth, yield and quality. The slow release fertilizer was applied at 3 rates. A combination of compound C and ammonium nitrate was used as the standard. Results so far indicate that application of the slow release nitrogen compound fertilizer produced similar growth, yield and quality as the standard application.
The Effect of Manure Use on Growth Yield and Quality of Tobacco

M. Matokwe

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ABSTRACT
Manure is known to have an extended period of nitrogen release. Variations in nutrient composition and release properties of manure have made it difficult for the TRB to recommend application rates with any degree of accuracy; since tobacco ripening is dependent on nitrogen depletion after topping. However, there are reports of growers using cow and chicken manures successfully for tobacco production. The objective of this study is to evaluate the effect of manure (cow and chicken) application on growth, yield and quality of tobacco. Manure was applied as a supplement to the standard fertilizer programme, and also in combination with a reduced standard fertilizer rate. Results will be available in due course and this information will establish if manure application is beneficial.
ABSTRACT
The optimum pH is critical in tobacco production to facilitate adequate nutrient uptake. Liming with solid lime (dolomitic and calcitic) focuses on existing acidity in the top soil and not generated acidity from fertilizer application. The management of generated acidity at deeper depths will lead to better nutrient recovery from applied fertilizers. A liquid lime product was tested for the amelioration of fertilizer generated soil acidity and calcium supply. The product was applied as a foliar, at planting (in the planting hole or dolloping-in after planting). If successful, this will alleviate soil pH problems mainly encountered by small holder growers with no access to calibrated liming equipment.
Nitrogen Applications on New Varieties and Their N Use Efficiencies

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ABSTRACT

New tobacco varieties developed by the Tobacco Research Board are high yielding and it is conceived that they are efficient in the utilization of nitrogen (N) fertilizer and water, but this has not yet been proved. The objective of this study was to evaluate varietal responses to different N application rates, quantify the N use efficiency and establish the optimum N requirements. Various nitrogen application rates are being tested and results will lead to more accurate varietal fertilizer recommendations and profitable tobacco production.
Basal Fertilizer Applications on New Cultivars

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ABSTRACT
Tobacco crops require 60–160 kg P₂O₅/ha for optimum growth, depending on the initial soil available phosphate. Excess application results in luxury consumption and increased costs of production. This phosphate requirement is based on research with earlier lower yielding varieties. In order to precisely recommend fertilization levels for the new higher yielding tobacco cultivars, various basal fertiliser application rates are being tested against the recommended rates obtained from a soil analysis.
Evaluation of Foliar Fertilizers and Organic Amendments on the Growth, Yield and Quality of Tobacco

D. Chinamo

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ABSTRACT

Foliar fertilizers are gaining popularity in the agriculture industry, and the mandate of the Tobacco Research Board is to ensure that any fertilizer used in tobacco production is beneficial and produces the desired leaf chemistry, yield and quality. Various foliar fertilizer brands are being continuously tested. Results so far indicate that all foliar fertilizers have no additional benefit to tobacco growth when used as a supplement or on their own.
Effects of Foliar Application of Calcium Nitrate and Potassium Nitrate on the Growth, Yield and Quality of Tobacco

D. Chinamo

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ABSTRACT

Some growers apply foliar sprays of either Ca (NO₃)₂ or KNO₃ as a replacement for the soil applied nitrogen side-dressing applied at topping (about 8 weeks after planting). This study was conducted to establish the efficacy of foliar applications of either Ca (NO₃)₂ or KNO₃. Current results indicate that foliar applications of both fertilizers at 15% (w/v) results in plant growth similar to soil applied nitrogen fertilizers.
Evaluation of Maleic Hydrazide for Sucker Control in Tobacco

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ABSTRACT
Topping is very important in the production of quality leaf tobacco. Tobacco plants have a terminal meristem that that produces auxins which suppress growth of axillary buds (apical dominance). Axillary shoots (more commonly referred to as suckers in tobacco); begin to grow vigorously as soon as the plants are topped. In Zimbabwe, only contact (Decanol) and local systemic (Pendimethalin) suckercides are registered for sucker control. Maleic Hydrazide (MH) is a systemic suckercide that inhibits cell division that is registered for sucker control in tobacco in other countries including the USA. The current study evaluates the effectiveness of MH for sucker control under Zimbabwean conditions.

Key Words: sucker, Maleic hydrazide, decanol, pendimethalin, axillary, apical dominance
Plant Health Services

Entomology

457. PVY Transmission Efficiency between the Red and Green Colour Characterization of the Tobacco Aphid, Myzus Persicae Nicotianae Blackman (Hemiptera: Aphididae)

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ABSTRACT

Potato virus Y (PVY), the type species of the Potyviridae family, has a wide host range and is distributed worldwide, causing serious crop losses in solanaceous crops such as potato (Solanum tuberosum), tobacco (Nicotiana tabacum), pepper (Capsicum annuum), and tomato (Lycopersicon esculentum). PVY is transmitted by more than 50 aphid species in a non persistent manner, however, the consensus is that Myzus persicae (Sulzer) (Hemiptera: Aphididae) is the most efficient vector. In this mode of transmission, acquisition and inoculation access periods are very short (seconds to minutes) and the aphids remain viruliferous for a very short period of time (minutes to a few hours). Although aphids can acquire PVY during brief probes (5 s) into epidermal cells, longer acquisition (10 s to 1 min) probes increase transmission efficiency. However, prolonged feeding (more than 5 to 10 min) results in poor transmission or no transmission at all. Aphid fasting prior to acquisition access is another factor affecting the transmission of PVY; starved aphids are more efficient PVY vectors than non starved ones. Vector specificity in plant virus transmission is a well-known phenomenon and can be attributed to the genetic properties of the aphid vector or the virus, or to the feeding behavior of the vector. Variation in the transmission efficiency of non-persistent viruses by different aphid species has been reported frequently. This phenomenon also occurs at the intraspecific level and has been recorded in various aphid–virus pathosystems. A strong genetic component in the interclonal variation has also been observed and it is against this background that the aim of this study is to investigate the PVY transmission efficiency between the red and green colour morphs of the tobacco aphid.

Key Words: PVY, transmission, aphids, red, green, morphs
ABSTRACT
Polyphenism, i.e., the production of two or more alternative phenotypes by a single genotype, is a characteristic feature of aphids. During the phase of parthenogenetic reproduction, most species produce a number of morphologically different phenotypes, among which are winged (alate) and wingless (apterous) morphs. Winged morphs are able to migrate and to colonise new host plants and are the basis for the daily aphid monitoring traps around Kutsaga. Winged morphs generally have a longer developmental time and lower fecundity than wingless morphs. This trade-off is fundamental to most wing polyphenic insects and is thought to maintain the polyphenism. In many species, winged morphs are produced only in response to deteriorating conditions, i.e. when individuals are crowded or feed on bad-quality plants however Weisser and Braendle have proved that in the pea aphids, clones differed in their propensity to produce the winged morph, and that in the pea aphid this propensity is linked to the colour of the phenotype. As compared to the 1963-67 trap catches, there has been a significant decrease in the number of winged tobacco aphids caught in yellow traps at Kutsaga from 2011 and this could be possibly linked to the transition from the green morph to the red morph currently found on tobacco. The aim of this greenhouse study therefore is to investigate whether body colour is linked with the propensity to produce winged morphs in the tobacco aphid and possibly explain the current winged aphid population catches.

Key Words: Polyphenism, winged, tobacco aphid, red, green
The Efficacy of Controlled Atmospheres for the Control of the Tobacco Beetle, *Lasioderma Serricorne*, In Flue-Cured Tobacco in Zimbabwe

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**ABSTRACT**

Every year, raw tobacco and manufactured tobacco products are lost to storage pests namely the Tobacco Moth, *Ephestia elutella* and Tobacco Beetle, *Lasioderma serricorne*. Management options for both insects have been maintenance of hygienic storage conditions, cold chamber treatment of baled tobacco, and the use of pheromones traps as well as fumigants. Due to the toxicity of the phosphine fumigants to users as well as the environment, most biologists have been opting for the use of controlled atmospheres which have been proven to be safe and environmentally friendly. Thus, there is need to explore safer and effective alternatives to insect storage pest control in tobacco. The use of vacuum packaging is a safe and environmentally benign method of tobacco beetle control. This study seeks to evaluate the efficacy of controlled atmospheres for the control of the tobacco beetle and the tobacco moth in stored tobacco.

**Key Words:** *Lasioderma serricorne, Ephestia elutella*, fumigants controlled atmospheres
In Search of the Alternate Hosts for the Tobacco Aphid, *Myzus Persicae Nicotiaene Blackman* (Hemiptera: Aphididae)

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**ABSTRACT**

*Myzus persicae* is a cosmopolitan polyphagous aphid species with a wide host range of cultivated and uncultivated plants comprising of over 400 plant species in 40 families. The tobacco adapted form, commonly known as the tobacco aphid is a serious pest of tobacco with a capacity to detoxify substances in tobacco thus causing widespread economic damage to the crop. In Zimbabwe, legislated planting and stalk destruction dates which ensure a dead period between seasons were set up to discourage the carryover of the pest as well as associated diseases such as PVY and bushy top from one season to the next. However, even during the period when tobacco is off-season, tobacco aphids are still being recorded in yellow water pan traps set up at Kutsaga research station for monitoring purposes. Thus an exhaustive survey to determine the off-season hosts of the tobacco aphid was carried out at Kutsaga. Aphid infested plant material will be collected from the field and brought to the laboratory where the aphids and hosts were identified. In addition, tobacco re-growths will be collected from the field and the biochemical components of their leaves determined and compared with those of plants from the current season to establish the reason why they carried dead alate aphids and were free from infestation. Host suitability studies will also be carried out to determine relative establishment of aphids on tobacco re-growths compared to current season crop.

**Key Words:** Host, *Myzus persicae*, tobacco regrowth’s, off-season, tobacco
ABSTRACT

Myzus persicae nicotianae is a polymorphic, cosmopolitan and highly polyphagous pest of economic importance. It has a host range of over 400 plant species including important crops such as cruciferous vegetables and tobacco. Its direct damage is through sucking of nutrient sap of phloem vessels causing wilting, reduction of yield or death of plant. Indirect damage is through viral transmission brought about by their high mobility and extreme polyphagy. Due to this high mobility, the current distribution range of the pest is expected to widen as it invades new areas. To further compound this problem, climate change is fast affecting the distribution of pests worldwide. It is projected that climate change will be much felt in Africa due to the low adaptive capacity of the continent to climate vulnerability. Therefore there is need to develop species distribution models (SDM) capable of determining the realized and potential niches of problematic pests. Such information is useful in long term planning of managing pests of economic importance such as the tobacco aphid. A desktop survey was carried out to determine the current tobacco growing areas in Zimbabwe. Algorithms were applied to temperature and rainfall data prevailing in most aphid prone areas and GPS coordinates of these areas subjected to the Maximum Entropy (MaxEnt) model using AFRICLIM high-resolution climate projections for ecological applications in Africa to map the current distribution and predict future distribution of the tobacco aphid in Zimbabwe then project the distribution to Africa.

Key Words: Myzus persicae nicotianae, MaxEnt, tobacco aphid, predict, AFRICLIM
Evaluation of *Beauveria Bassiana* (Beauvitech) and *Metarhizium Anisopliae* in the Laboratory for the Control of the Tobacco Budworm *Helicoverpa Amigera*; Lepidoptera: Noctuidae

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**ABSTRACT**

The repeated use of conventional insecticides against pests could cause serious ecological problems, including detrimental effects on non-target arthropods, environmental pollution, food contamination, and development of insecticide resistance. These problems have raised concern about the sustainability of chemical approach for pest control. Recently, ecologically compatible strategies to manage pest populations were developed, including the use of entomopathogenic fungi, viruses, nematodes, protozoa, and bacteria as biological control agents. Under controlled conditions, various isolates of *Metarhizium anisopliae* and *Beauveria bassiana* have been shown to be active against adults, larvae and pupae of many diptera, coleoptera and lepidoptera. In this regard, this study seeks to evaluate the effectiveness of a commercial product (Beauvitech) based on a *B. bassiana* isolate as well as *M. anisopliae* against larvae of *Helicoverpa amigera* on tobacco under laboratory conditions.

**Key Words:** *Beauveria bassiana, Metarhizium anisopliae, Helicoverpa amigera, Budworm control*
Evaluation of Beauveria Bassiana (Beavitech) and Metarhizium Anisopliae in the Laboratory for the Control of the Cutworm Agrotis Spp; Lepidoptera: Noctuidae

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ABSTRACT
Entomopathogenic fungi represent a valuable management resource to be utilized within an IPM framework, and will contribute significantly to reductions in chemical pesticide use in agro ecosystems if used consistently. This comes as a result of concerns on development of resistance to chemical insecticides and the deleterious effects of chemicals on environmental and human safety. A diverse assemblage of microorganisms such as viruses, bacteria, protozoa and fungi are currently under consideration as control agents of insects. Of the fungi, considerable effort has focused on the utilization of entomopathogenic Hyphomycetes. Therefore this study seeks to evaluate the effectiveness of B. bassiana as well as M. anisopliae against larvae of cutworms on tobacco in the laboratory.

Key Words: Beauveria bassiana, Metarhizium anisopliae, Cutworm, dead larvae
Plant Pathology

464. Evaluation of AN INTEGRATED PEST MANAGEMENT PROGRAMME OF Three Strobilurins and a Biocontrol Agent Trichoderma Harzianum (T77) For the Management of Pythium Root Rot ON TOBACCO

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ABSTRACT

Pythium root rot is an economically important disease in the float seedling production system in tobacco. While effective, fungicides carry a high risk of resistance building up among pathogen populations. There is, therefore, a need for alternative control methods for use in combination with effective fungicides. Biocontrol agents offer an environmentally friendly alternative for the management of pests and pathogens in crop production. According to literature (Salman, M. and Abuamsha, R., 2012) strobilurins currently registered for the management of frog eye and Alternaria leaf spot, are also effective for the management of Pythium spp. The main objective of this trial is to evaluate three strobilurins alone and in combination with the local biocontrol agent Trichoderma harzianum (T77) for the management of Pythium root rot in the tobacco float beds.

Key Words: Pythium root rot, integrated pest management, strobilurins, float beds
ABSTRACT
Potato Virus Y (PVY) is an aphid-transmitted virus that causes disease in solanaceous crops including tomato, pepper, tobacco, and potato. In Zimbabwe, PVY is one of the most economically damaging plant viruses of tobacco. Currently no resistance has been bred into the Kutsaga tobacco varieties. Thus the main means of control remains the management of the aphid vector with the use of aphicides to prevent disease spread and establishment. While the use of cultural control measures remains the most sustainable and effective option, growers have generally been ignoring the recommended practices such as early planting and timely stalk destruction. Additionally, with continued delays in the arrival of the rains, growers of rain fed crops continue to establish their crops later and later into the season. This study, therefore, is aimed at evaluating additional, environmentally friendly control products such as mineral oils and commercial biological viricides for their effectiveness.

Key Words: Potato Virus Y (PVY), biological viricides, mineral oil
Additional Control Options for the Fungi, *Fusarium* and *Rhizoctonia* on Tomatoes and Potatoes

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**ABSTRACT**

The Plant Health Services Division operates a Plant Clinic where diagnostic and advisory services are offered to growers. Data on samples received show that ~52% of the samples are non-tobacco crops, namely potatoes, tomatoes, ornamental and other horticultural crops and that *Fusarium* and *Rhizoctonia* spp. are among the most prevalent pathogens isolated. A literature search on the recommended agrochemicals for the management of these pathogens in Zimbabwe, show thiabendazole as the most recommended fungicide. However, this fungicide is applied pre-plant and is no longer a viable option at the time of disease diagnosis. To enable the Plant Clinic to assist growers in managing these pathogens there is a need to explore for and evaluate more fungicides, biological control agents and other control options. The main objective of this study is to establish alternative management options for *Fusarium* and *Rhizoctonia* on tomatoes and potatoes.

**Key Words:** potato, tomato, *Fusarium* and *Rhizoctonia* spp., biological control, strobilurins
Economically Important Pathogens of Peas (Pisum Sativum) In Zimbabwe and Evaluation of Possible Management Methods

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ABSTRACT

The Tobacco Research Board has for three seasons grown peas (Pisum sativum) as a rotation crop. The crops that have been grown so far have shown some persistent disease challenges mostly from the pathogens Rhizoctonia, Fusarium and Pythium spp. However, there is very little information on the control methods of pea diseases. The objectives of this project, therefore, are to generate information on the problem pathogens of peas and to evaluate control options such as fungicides and biocontrol agent Trichoderma harzianum. This information will be made available to peas growers in the form of a technical bulletin.

Key Words: pea, Fusarium, Rhizoctonia and Pythium spp., biological control, strobilurins
Control Options of *Fusarium* and *Rhizoctonia* Spp. of Gum Trees (*Eucalyptus* Spp.)

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**ABSTRACT**

The Tobacco Research Board provides gum tree seedlings to tobacco farmers to combat the deforestation resulting from the use of indigenous trees as sources of curing fuel for tobacco. However, *Fusarium* and *Rhizoctonia* spp. have been established to affect gum trees in the float beds. Very little information on the control methods of these diseases on gum trees is available. The objective of this study, therefore, is to generate information on the problem pathogens of gum trees and to evaluate control options such as strobilurin fungicides and biocontrol agents *Trichoderma harzianum* and *T. asperellum*.

**Key Words:** *Eucalyptus* spp., *Fusarium* and *Rhizoctonia* spp., biological control, strobilurins
Nematology

469. Host Status of Leguminous Crops towards Root-Knot Nematodes (*Meloidogyne* Spp.)

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**ABSTRACT**

Among all described phytoparasitic nematodes, root-knot nematodes (RKN) are the most damaging. Their control is most difficult due to their sophisticated biology, host interaction and wide host ranges. Management of RKN has been achieved for decades by use of chemical nematicides. However, concern for the environment has led to the banning and phasing out of the fumigant nematicides. Due to this, scientists are driving their attention to other environmental friendly alternatives and crop rotation is one such option. Inclusion of crops from the family *Leguminosae* in rotations has been reported suppressive to damaging plant-parasitic nematodes, RKN included. The advantage of legume crops is that, they also fix atmospheric nitrogen, the foliage can be used as green manure and they serve as break crops which further minimize the need or use of external inputs. A trial was therefore conducted to evaluate the effectiveness of common bean (NUA 45, Sweet violet, Cherry and Gloria), cowpea (varieties CBC1 and CBC2), groundnuts (cultivars, Ilanda, Tern and Falcon) and sunnhemp for the management of RKN. The first season results indicated that groundnuts are the most effective and gave control comparable to that of sunnhemp, a resistant legume.

**Key Words:** rotation, *M. javanica*, fumigants
The Influence of Tobacco Root Diffusates and Host Age on Hatching of *Meloidogyne javanica*

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**ABSTRACT**

The root-knot nematodes (RKNs), *Meloidogyne javanica*, cause severe damage to economically important crops including tobacco. They are able to survive adverse conditions either at the embryonic stage or the juvenile stage. RKNs achieve this as they undergo a period of dormancy, usually divided into diapause and quiescence. Therefore, dormancy and hatching response of many plant-parasitic nematodes including RKNs is synchronised with the presence of host plants. In some studies, it was discovered that, hatching of some RKN spp. is influenced by stimulus - host root diffusates. However, some other studies generalized that, hatching of juveniles of *Meloidogyne* spp is primarily temperature driven. Kutsaga has over the years developed a number of tobacco varieties that are resistant to the root-knot nematode (*M. javanica*). Work however, needs to continually be conducted to better understand the host/pathogen interaction and develop effective management strategies. Studies on the biology of *M. javanica*, and its host-rkn interactions enable the development of an efficient strategy for its detection and control. The objective of the study was to determine the effects of tobacco root diffusates and host senescence on *in vitro* hatching *M. javanica*. First season results indicated that the root diffusates from K RK66 had the highest hatching percentage followed by T72, T71, K M10, T73, K RK26 and T74 having the least effect on hatching. The results indicate that the root diffusates of the seven tested tobacco varieties had no inhibitory or delaying effects on hatching *M. javanica* J2. It, therefore, appears that, the resistance mechanism of the tobacco cultivars tested in this study is due to the stemy and hard nature of the roots that impedes nematode penetration.

**Key Words:** resistance, root-knot nematodes, root-diffusates
Characterisation of New Kutsaga Rk Varieties for Resistance to the Root-Knot Nematode (Meloidogyne Javanica)

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ABSTRACT
Nematode management strategies in tobacco encompass chemical, cultural, biological control and the use of resistant cultivars. Host-plant resistance is a cost-effective option that complements other control strategies. Kutsaga has over the years developed a number of tobacco varieties that are resistant to the root-knot nematode, Meloidogyne javanica. The objectives of this study are to evaluate the relative resistances of the newly developed varieties to root-knot nematode. This will be done by evaluating the extent of root galling and the nematode reproductive rate on each of the varieties. Additionally, the study will evaluate host-parasite interactions to better understand the mechanisms of resistance.

Key Words: Root knot nematode, reproductive rate, gall-rating, hypersensitive response
ABSTRACT
Chemical nematicides such as halogenated aliphatic hydrocarbons (e.g., 1,3-dichloropropene), methyl isothiocynate mixtures, Oxamyl, Thionazin and Carbofuran are effective in the management of nematodes but are not eco-friendly and in the course of time may cause serious threat to the ecological balance. Recently in tobacco production, there has been de-registration of some hazardous nematicides, increasing pressure on farmers to use non-chemical pest control methods that do not pollute the environment. The use of an integrated approach to nematode control encompassing other cultural and biological control measures is more sustainable. The use of botanical products such as Neem (*Azadirachta indica* A. Juss) for root-knot nematode control is widely documented. However, no botanical products are registered for nematode control on tobacco in Zimbabwe. The objective of this study is to evaluate the efficacy of neem and garlic pellets for the control of root-knot (*Meloidogyne javanica*) in tobacco.

Key Words: Neem, Garlic Pellets, germination, survival
473. Establishment of the Relative Resistances of 12 Kutsaga Varieties to Root-Knot Nematodes

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ABSTRACT
The Tobacco Research Board’s mandate is to develop cost-effective pest-management strategies that enable growers to derive value from tobacco production. Among the most effective root-knot nematode management strategies is the development and provision of resistant cultivars. A number of flue-cured tobacco varieties have been developed with varying levels of rkn resistance with some capable of being successfully grown with no nematicide provided proper rotations are conducted. The objective of this trial is to annually establish a demonstration plot with Kutsaga’s most popular root-knot nematode varieties and evaluate their performance under high nematode population. Two plantings, a mid-October and mid-November will be done on fumigated and unfumigated plots. Growers are then given an opportunity to rate the performance of these varieties, through field discussions.

Key Words: Resistance, gall-rating, bioassay, fumigation
ABSTRACT
A number of nematicides have been evaluated and are recommended for use on tobacco on Zimbabwe. However, the different products give different levels of control and their persistence also varies, with some requiring multiple applications. For growers to be better able to cost-effectively grow tobacco and maximize profits it is important for the cost of the nematicides used to be justifiable from the yield and quality gains. The objective of this trial is to annually establish a demonstration plot where all registered nematicides are applied as recommended. Growers will then have an opportunity to view the trials and evaluate the performance of the crop. Additionally, a cost-benefit analysis (yield gains less cost of nematicide) from using the different registered nematicides on tobacco will be conducted.

Key Words: Cost-benefit, nematicide, yield, tobacco
Optimisation of Nematicide Application Methods for the Methyl-Isothiocyanate Generators Metham-Sodium and Metham-Potassium

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ABSTRACT
The methyl isothiocyanate generators (Metham-sodium and Metham potassium as liquid formulations and dazomet as a granular formulation) are very effective against nematodes and are widely used worldwide. However, although these are broad-spectrum biocides, their performance is inconsistent because of inadequate volatility. The rate of decomposition of Metham-sodium may be influenced by soil temperature and moisture, resulting in poor soil distribution and reduced capability to penetrate and kill woody roots or tubers. Against this background, there is need to optimize the use of these nematicides using current methods of application, for improved efficacy, as the search for alternatives to fumigants, which are being phased out, continues.

Key Words: Metham-sodium, Metham-potassium, tines, fumigation gun
ABSTRACT

The leaf is the most important part of the tobacco plant because of its physiological roles and the fact that it is the product of economic importance. Leaf area measurements are therefore important as they reflect plant growth and may be useful in predicting final yields of the cured leaf. Different approaches to determine leaf area have been used, the leaf area meter, use of photographs, with the most popular method being the model \( A = kLW \) (where: \( A \) = area, \( L \) = length of the leaf, \( W \) = width at the widest part and \( k \) = is a constant). It follows that \( LW \) is the area of a rectangle with dimensions \( LW \). However, if a leaf is superimposed on a rectangular shape, the leaf does not cover the whole area but some proportion of the rectangle. It is for this reason that "\( k \)" a constant is introduced in this model. Leaf shapes differ across varieties of the same species and within the same plant at different leaf positions. Such differences result in \( k \) assuming different values per species, variety or leaf position. We hypothesize that \( K \) values differ across flue-cured tobacco varieties and leaf positions within a variety. Secondly Leaf area can be used as an indicator of growth response and yield predictor. To test these hypotheses, 270 leaf samples will be collected from 3 tobacco varieties, viz K RK26R, K RK66 and T71 from fields at Kutsaga Research Station. For each variety, 3 leaves per plant within the lugs, leaf and tips positions will be collected from 30 plants. Leaf length (L) will be measured at the midrib while width (W) will be measured from the widest part of the leaf. Measured leaves will be collected for actual leaf area determination using the 2 different methods. The first method, will first establish the relationship between paper weight and its area. After that the leaf shape will be traced on the paper and weighed. Using the relationship between paper weight and area, then the actual leaf area will be computed. The relationship between paper weight and its area will be used to determine the area. The second method will be to trace the leaf shape onto a graph paper, and then count the number of squares. The two methods’ results will be regressed to validate their accuracy and consistency. The collected leaves will be oven dried at 80 °C using micro barns and dry mass will be measured after for 48 hours. The relationship between linear measurements \( L \) and \( W \) or their product \( LW \) will be determined by regression modelling against the actual leaf area from shadow graphing results. We expect to develop 2 models, the first one relating linear measurements to leaf area and the second one relating leaf biomass to leaf area parameters at variety and leaf stalk position level. The generated models can be used by researchers in growth response studies and by growers to estimate yields.

**Key words:** Tobacco, Biomass, Leaf, Length, Width, Modelling

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Molecular Biology Services

477. Development of a Loop-Mediated Isothermal Amplification (Lamp) As a Diagnostic Tool for PVY and TMV Viruses in Tobacco

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ABSTRACT
Tobacco viruses cause a wide range of diseases that heavily reduce tobacco quality and yield worldwide. Currently, available diagnostic tools for tobacco viruses especially PVY and TMV require sophisticated equipment and highly skilled personnel to set up experiments and interpret the results. The advancement in genomics, bioinformatics and accumulation of more and more DNA sequence data is transforming the way in which plant pathogens are identified and diseases are diagnosed in an efficient, simple, rapid and cost effective manner. In this study, a LAMP assay that proceeds under isothermal conditions will be designed targeting the coat protein (CP) gene of TMV and PVY. The development of the LAMP assay for identification of PVY and TMV will allow for diagnostic assays to be run directly in the field or at remote locations other than the standard laboratory. Rapid diagnosis can result in accurate and quick implementation of effective diseases control measures.

Purpose: To develop a LAMP assay for detection of viruses and fungi in tobacco production systems

Status (completed/ in progress): in progress

Subject: Pathogen identification

Intended publication: Yes
Genetic Diversity of Zimbabwe Tobacco Landraces

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ABSTRACT

The use of Zimbabwe tobacco landraces in developing varieties better suited to climate change environments may become critical in the future, thus the need to properly characterize the tobacco landraces using molecular based DNA techniques. The occurrence of several landraces with similarity in morphology poses a quandary especially when relying on morphological data which have been shown to be of limited value for modern systematics due to their inherent simplicity, evolutionary convergence, parallelisms and phenotypic plasticity. Thus, this study seeks to determine the genetic relatedness of the Zimbabwe tobacco landraces maintained in the Kutsaga germplasm library for unambiguous use of the accessions in the future.
Development of Qualitative Multiplex PCR for GMO Detection Method

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ABSTRACT
The incidence of Genetically Modified Organisms (GMOs) is increasing worldwide and in no-GMO legislated countries the detection of GMOs plays a vital role in food safety. Development of a reliable yet cost and time saving analytical method to detect GMOs is important. Multiplex PCR has the advantages of being rapid, reliable and offers a huge saving on consumables thus screening and identification of GM materials in samples can be done more efficiently and yet in a cost saving way. Thus, this study seeks to develop and test a qualitative multiplex PCR method for GMO detection in plant materials.
Development of a Quantitative Real-Time PCR Assay for the Detection and Identification of Viruses in Tobacco

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ABSTRACT

PCR-based methods have become the standard for accurate and specific detection of a wide array of plant pathogens including viruses. Currently, a variety of techniques have been established for the detection of viruses in tobacco, including inoculation of indicator hosts, electron microscopy, ELISA and visual inspection. These methods are time consuming and do not provide the sensitivity that is needed to detect low-levels of Tobacco Mosaic Virus (TMV) and Potato Virus Y (PVY) in tobacco. Furthermore, traditional methods are subjective and open to influence by environmental factors. This project, therefore, seeks to develop reliable, precise, rapid and robust qPCR-based protocols for the identification of TMV and PVY in tobacco for effective implementation of disease control measures.
Monitoring By Real-Time PCR the Spread of TMV in Tobacco Seedling Production

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ABSTRACT

Tobacco mosaic virus (TMV) causes significant losses in many economically important crops. Contaminated materials, dried tobacco, tobacco seed and tobacco plants play a role as reservoirs and sources of transmission for TMV. Therefore a specific and rapid method for detecting slight amounts of TMV particles is important and scientifically significant for the prediction as disease management strategy to prevent diseases. A detectable threshold both in field soil/residues and seedlings prior to planting could imply generating a diseased crop and planting can therefore be intercepted. The objective of this study is therefore to monitor the presence of TMV in tobacco seed, tobacco seedlings, and farming equipment using a qPCR approach.
Population Structure and Dynamics of *Pythium* Spp. in Tobacco Float Seedling Production

*F. Mufunda*

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**ABSTRACT**

*Pythium* species are important soil-borne oomycetes occurring in the tobacco float seedling production in Zimbabwe. However, despite the widespread occurrence of *Pythium* spp. in tobacco float seedling production and the significant amount of damage that they cause, little is known about their genetic diversity or population structure. Successful development of disease management programs for *Pythium* can be supported by understanding the population structure and the mechanisms by which variation occurs. This information will assist in the breeding of resistant/tolerant germplasm and, ultimately, the deployment of the most appropriate disease management strategies for specific tobacco growing regions. The objective of this study is therefore to determine the population genetic structure and differentiation of *Pythium* spp. in Zimbabwe.
Validaton of a Method for the Analysis of Synthetic Pyrethroids Residue Levels in Tobacco

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ABSTRACT

The aim of the study is to develop and validate a method for the analysis of synthetic pyrethroids in flue-cured tobacco. The study was necessitated by the increasing popularity of the pyrethroids as pest control agents. Pyrethroids have received a special place in the integrated pest management system of many crops, including tobacco due to their broad spectrum as insecticides as well as their low mammalian toxicity and short term environmental persistence when compared to other classes of pesticides. The analytical method being developed will involve extraction of deltamethrin, tefluthrin, lambda cyhalothrin, fenvalerate, tefluthrin, beta cyfluthrin and cypermethrin by maceration with acetonitrile. Liquid-liquid partitioning using hexane will be the initial clean-up stage followed by column cleanup with activated moisture florisil and ether in hexane. Finally the residues will be dissolved in hexane for analysis using Gas Chromatography coupled with an ECD detector. Measurements to be taken include accuracy, precision, residue level in tobacco, LOD, LOQ, repeatability, reproducibility, ruggedness and linearity.
Comparison of the Nelson-Somogyi (NS) and the 3,5 Dinitrosicylic Acid (DNS) Methods for the Determination of Reducing Sugars in Tobacco

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ABSTRACT

The Nelson-Somogyi (NS) and the 3,5-dinitrosalicylic acid (DNS) methods for the determination of reducing sugars have found wide application including the evaluation of reducing sugars in tobacco. The performance parameters for the two methods are being assessed in order to make a performance comparison. The accuracy, precision, LOD, LOQ and measurement uncertainties for the two methods will be compared. Results for these will be made available as soon as this is done.
485. Method Development and Validation for the Analysis of Organophosphates in Tobacco

M. Mutanhaurwa and C. C. Musuna-Garwe

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ABSTRACT
Crop Protection Agents (CPAs) residues are monitored in compliance with the implementation of Good Agricultural Practice (GAP) in tobacco production. Organophosphates (OPs) form the largest group of CPAs on the CORESTA Guidance Residue Levels (GRLs) list and a multi-pesticide method helps to reduce cost and time for their analysis. The tobacco samples will be ground, macerated in ethyl acetate, filtered, refrigerated and centrifuged before injection on gas chromatography with flame photometric detection instrument (GC-FPD) in phosphorus mode. Accuracy, repeatability, reproducibility, linearity, range, limit of detection and quantification will be determined for the method. The recommended recovery range is between 70% and 120%. The recommended precision is 20%.
Method Development and Validation for the Analysis of 2.4 Dinitroanilines in Tobacco

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ABSTRACT

A simultaneous analysis of six 2.6 dinitroanilines in tobacco is being developed with high performance liquid chromatography tandem electrospray ionisation mass spectrometer (LC-ESI-MS/MS). Residues of Pendimethalin, Trifluralin, Benfluralin, Butralin, Isopropalin and Flumetralin in tobacco will be extracted with soxhlet extraction followed by liquid-liquid partitioning with acetonitrile. The extract will be further cleaned on a Florisil column with hexane and hexane-diethyl ether (9:1, v/v) as the eluant. Measurements done will include accuracy, precision, residue level in tobacco, LOD, LOQ, repeatability, reproducibility, ruggedness and linearity.
Energy and Curing Efficiencies of Current Barns in THE TIPS PROGRAMME: A SURVEY

W. Munanga

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ABSTRACT

The use of indigenous woodlots particularly by small-scale growers for tobacco curing has contributed significantly to deforestation in Zimbabwe. There is therefore a need to develop energy efficient curing structures for sustainable tobacco production. Barn efficiency in tobacco curing is the baseline that needs to be considered for design improvements. This paper discusses the results obtained from a survey that was conducted to assess the current curing efficiency from 120 tobacco growers randomly selected from different districts in Zimbabwe.

Key Words: barn efficiency, small scale, curing efficiency, deforestation.
Establishment of a Reliable System to Estimate Water Requirements in a Tobacco Crop

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ABSTRACT
It is imperative to establish efficient ways of applying irrigation water to maximise productivity whilst ensuring a balance in the soil-plant and water ecosystem. A trial was set up to establish a reliable system to estimate irrigation water requirements to maximize yield from irrigated tobacco. Two irrigation scheduling methods commonly used in tobacco production (the calendar-based and crop water requirements-based) were evaluated. Results showed that the tobacco in the crop water requirement irrigation schedule consistently had greater leaf expansion compared to that in calendar-based schedule. Leaf yield data also showed higher yields in the crop water requirements-based scheduling plot (4030 kg / ha) compared to the calendar-based scheduling plot (3500 kg / ha). Therefore faced with climate change, the crop water requirements-based scheduling was recommended to enhance water conservation and management.

Key Words: irrigation scheduling, calendar based, crop water requirements, climate change.
Evaluating the Curing Efficiency of the Kutsaga Counter-Current 1 Barn in Tobacco Curing

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ABSTRACT
Most small scale tobacco growers in Zimbabwe rely on wood - fuelled old conventional barns because they are viewed to be inexpensive to construct, operate and maintain. However, these traditional barns are known to be inefficient with wood to dried tobacco ratio of 14 kg: 1 kg respectively. This level of fuel wood use is not sustainable as it results in massive tobacco-curing related deforestation. Currently, the rocket barn is the most energy efficient barn being adopted by most small scale growers. However, the limiting factor in the use of the rocket barn has been that it was designed for small hectarages and has a curing capacity of only 0.5 ha. Many small scale growers have since expanded their tobacco production to 1 - 2 ha resulting in the need for larger capacity barns. The objective of this trial was to develop a low-cost fuel efficient barn with a bigger capacity. A barn named the Kutsaga Counter-Current 1 (KCC1) was then developed. The curing efficiency evaluations conducted indicate that the barn utilizes 3.5 kg of wood to produce a kg of cured tobacco within 6- 7 days. Given the high fuel use efficiency, the KCC1 barn is an addition to the array of barn designs available for growers to choose from.

Key Words: deforestation, curing efficiency, sustainable, counter-current.
Evaluating the Irrigation Efficiency of Single Drip Irrigation Lines on Double Row Tobacco Plants

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ABSTRACT
Most small scale tobacco growers in Zimbabwe rely on natural rainfall for the production of their crops. However, with climate change these growers frequently face dry spells that significantly reduce production levels and compromise food security. This therefore necessitates the use of irrigation in tobacco production. Drip irrigation system is the most efficient system with application efficiency as high as 95%, but the cost of setting up a drip irrigation system is high. High setting up costs in drip irrigation systems can be reduced through new designs that increase efficiency. This paper discusses the results of the trial that was set up to evaluate the effectiveness of a single drip line on two rows as opposed to the single row currently used.

Key Words: small scale growers, drip irrigation, climate change, productivity.
491. Supporting smallholder farmers in southern Africa to better manage climate-related risks to crop production and post harvest handling (CLIRCS)

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PROJECT SUMMARY

The overall objective of the project is to contribute to improved and sustained household and national food and nutrition security in southern Africa through better management of climatic risks by smallholder farmers. The project is led by the United Nations Food and Agriculture Organization (FAO) with funding from the European Union following a competitive grant call under Food Security Thematic Programme (FSTP) - Global Programme on Agricultural Research for Development (ARD). Specifically the project aims to: i) Develop and promote innovative techniques, methods and approaches to managing risks to crop production and post-harvest handling associated with drought, floods and cyclones; ii) Strengthen regional knowledge and institutional arrangements on risk management for crop production and post-harvest handling in climate disaster-prone areas. The project is implemented Madagascar, Malawi, South Africa and Zimbabwe. In Zimbabwe the project is implemented in Hwedza (high potential prone to drought) and Mbire (prone to drought and floods) Districts. Both areas have high incidences of malnutrition. The project employs the SOFECSA Learning Centre approach, which brings together national research institutions, public extension (Agritex), private seed and fertilizer companies and farmers. The project also seeks to strengthen postgraduate training among the participating countries through exchanges and joint student supervision. Initiated in 2011, the project is expected to end in June 2016.

Key Words: Climate risks, crop production techniques, soil fertility, Farmer Learning Centres, co-innovation
492. Strengthening African capacity in soil geochemistry to inform agricultural and health policies

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PROJECT SUMMARY

The overall objective of this project is to strengthen capacity and improve knowledge of soil geochemistry in Malawi, Zambia and Zimbabwe through training of PhD students, and technicians and as well as strengthening capabilities in laboratory techniques in participating universities and research institutions in the three countries. The project is funded by the Royal Society (RS) and UK Department for International Development (DFID). Understanding soil geochemical processes is vital to provide the evidence-base for sound policy decisions in agriculture (e.g. effects of liming and nutrient inputs from conventional and organic sources) and public health (e.g. mineral deficiencies/toxicities). The project seeks to establish a cross-disciplinary Doctoral Training Network (DTN) will be established to build a firm foundation in soil geochemistry skills, including: analytical chemistry; experimental design; geospatial data collection and integration; geochemical and statistical modelling; soil management; vocational skills. One of the anticipated outcomes of the project is the establishment of PhD training programs in Malawi and Zambia and international benchmarking of PhD training across the three countries. In Zimbabwe, the project is implemented in Hwedza, Mutasa and Mbire Districts. Started in 2015, the project is expected to end in 2020.

Key Words soil geochemistry, capacity development, food and nutrition security
493. Agro-ecology based aggradation-conservation agriculture (ABACO): Targeting innovations to combat soil degradation and food insecurity in semi-arid Africa

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PROJECT SUMMARY

Research evidence indicate that poor soil fertility and soil physical degradation are major limitations to food security in sub-Saharan Africa, putting many smallholder farmers in a vulnerable position. Degradation of natural resources, caused by population pressure, inappropriate practices and climatic variability, threatens agricultural productivity. Conducted in Hwedza and Makoni districts (2011-2015), the project sought to address some of these challenges through establishment of stakeholder partnerships, and building on emerging SOFECSA innovation platforms in Mozambique and Zimbabwe. The overall objective was to reduce the vulnerability of smallholder farmers to climatic variability by building capacity through co-innovation platforms to design, evaluate and implement targeted technological options for and mechanisms to promote adoption of conservation agriculture (CA) based on agroecology principles to combat land degradation and food insecurity in semi-arid regions of Africa. The project was led by the African Conservation Tillage Network (ACT) and implemented by SOFECSA in Mozambique and Zimbabwe. The specific objectives were: i) To adapt CA systems to local farmer circumstances, evaluating its principles for effects sought by communities in terms of food production and land rehabilitation in the face of climatic variability; ii) To promote the adaptation/appropriation of technologies by local communities through co-innovation platforms; iii) To assess the social and economic viability and tradeoffs of implementing CA at farm and village scales, and across scenarios, to inform policies; iv) To promote dissemination of targeted CA alternatives and approaches through divulgation, training and capacity development; To reinforce existing knowledge networks on CA and build their institutional capacities for research and development partnerships. The project employed a combination of approaches including innovation platforms, farmer learning centres and experimentation to test integrated soil fertility management (ISFM) and conservation agriculture technologies and principles in farmers’ fields. The major outcome included revealing the practical limitations of the approaches and their potential adaptation to suit farmer circumstances and promotes increased productivity to alleviate food security challenges faced by different categories of households in the face of climate change. High labour demands and
lack of mechanization were major factors limiting potential transformation of smallholder agriculture. The project led to the development of options for restoring productivity of soils that are otherwise abandoned by farmers due to lack of response to fertilization.

**Key Words** integrated soil fertility management, conservation agriculture, participatory action research, land degradation, poor soil fertility
College Of Health Sciences

494. Vulva cancer at Harare and Parirenyatwa Central Hospitals

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ABSTRACT

Background/Introduction
The incidence of cancer of the vulva has been noted to be increasing worldwide. There is no information on the incidence of cancer of the vulva among women at Harare and Parirenyatwa Central Hospitals.

Objectives
To determine the prevalence of cancer of the vulva at Harare and Parirenyatwa Central Hospitals and to determine the most common symptoms that are the most common physical findings in patients presenting with the disease and the treatment modalities that are offered.

Methodology
The study is a cross-sectional observational study. In the retrospective component, data will be collected from the records of patients who will have been treated for cancer of the vulva at the two hospitals in the last five years. In the prospective component, data will be collected from patients presenting with cancer of the vulva at the two hospitals over the coming one year.

Setting
The setting is the gynaecological wards and outpatient departments of hospitals as well as the Department of Pathology and the Radiotherapy Centre.

Participants
The participants are patients who have been treated for cancer of the vulva at the two hospitals over the past five years and those who will be treated for the disease over the coming one year.

Intervention
There will be no intervention in the study.

Main Outcome Measures
The main outcome measures will be the incidence of cancer of the vulva, the symptoms that the patients present with and the treatment modalities that they receive.
495. Factors Associated with Human Immunodeficiency Virus First Line Treatment failure in Zvishavane District, Midlands Province, 2014

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ABSTRACT

Background

Globally, reported prevalence of first line Human Immunodeficiency Virus (HIV) treatment failure show inter-region and intra-region variability. However, there has been a significant increase in prevalence of HIV treatment failure over time since antiretroviral therapy (ART) roll out in Sub-Saharan Africa. Zvishavane district had the highest prevalence of HIV treatment failure at 16%, which is well above regional prevalence of 5.5%, in Midlands Province in 2013. The district was the least performer in Zimbabwe on Early Warning Indicator (EWI) 1 (on time pill pick up). While the district achieved 86%, which is above national target, on EWI 2 on retention in care, it fell short of national target on EWI 3 on pharmacy stock outs. The study was conducted to determine factors associated with first line HIV treatment failure in Zvishavane district.

Objectives:

To determine factors associated with first line HIV treatment failure in Zvishavane district

Methodology

A 1:1 unmatched case control study was conducted. A case was an HIV patient who was on first line ART for at least 6 months in Zvishavane district and switched to second line ART regimen because of treatment failure during the 2013/2014 period. A control was an HIV patient in Zvishavane district who was on first line ART, had been on first line ART for at least 6 months and has not failed first line ART. Random sampling was used to recruit study participants. Epi Info™ was used to generate means, frequencies and odds ratios at 95% confidence interval and a level of significance of 0.05. Forward stepwise logistic regression was used to determine independent risk factors for first line HIV treatment failure.

Results

Independent risk factors associated with first line HIV treatment failure were poor adherence (<80% adherence) to ART (AOR=5.14, CI 2.75-9.62), drug stock outs (AOR=3.02, CI 1.20-6.98), CD4 count of <50 cells/mm$^3$ (AOR=3.25, CI 1.47-7.16) and baseline WHO Stage 3 or 4 (AOR=1.95, CI 1.05-3.61). Significant risk factors were drinking alcohol (OR=2.05, CI=1.08-3.90) and long patient waiting time (OR=2.49,CI 1.48-4.19). Significant protective factors were receiving at least one individual counseling on ART (OR=0.35, CI 0.18-0.69), disclosure of HIV status (OR=0.34, CI 0.14-0.80) and having previously undergone Prevention of Mother to
Child Transmission (PMTCT) (OR=0.41, CI 0.17-0.96). Both cases and controls had good knowledge of first line HIV treatment failure.

**Conclusion**

Multiple etiological factors were associated with first line HIV treatment failure in the district. Poor adherence, difficulties accessing ART, CD4 Count of <50 cells/mm$^3$ and baseline WHO Stage 3 or 4 were demonstrated to be independent risk factors for HIV first line treatment failure in the district. Providing counseling, disclosing HIV status and receiving PMTCT were significantly protective in Zvishavane district.
Prevalence of TP53 tumour suppressor gene codon 72 polymorphism in Zimbabwean patients with cervical cancer

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ABSTRACT

Introduction

The polymorphisms in the tumour suppressor gene TP53 have been investigated as candidate genetic markers for the risk of developing cancer. Several studies have shown that the single nucleotide polymorphism (SNP) of the codon 72 of the tumour suppressor gene TP53 which results in an amino acid change may be associated with increased risk of cervical cancer in some populations. The aim of this study was to determine the frequency of the TP53 72G>C (codon 72) polymorphism and their potential association with the risk of developing cervical cancer in Zimbabwean women.

Methodology

Clinical data was abstracted from the records of patients who had histologically confirmed cervical cancer attending the Radiotherapy Centre (RTC) at Parirenyatwa Hospital Harare, Zimbabwe. Consenting participants provided blood samples for genetic analysis. Additional control participants were recruited from the National Blood Service of Zimbabwe (NBSZ). Genomic DNA was extracted from the whole blood samples and amplified by the polymerase chain reaction (PCR). Genotyping of the codon 72 polymorphism was performed using the restriction fragment length polymorphism (RFLP) method. Genotype and allele frequencies were determined and association with other clinical variables was determined using logistic regression and risk of cervical cancer was determined using odds ratio (OR) calculations.

Results

The frequencies of the Arg/Arg; Arg/Pro and Pro/Pro in cervical cancer patients were reported as 15.07%, 43.84% and 41.10% respectively. The association between the TP53 Arg/Arg genotype (GG) and the development of cervical cancer was not statistically significant. (OR=1.78; P-value= 0.29; 95% CI, 0.54-6.12).

Conclusion

The frequency of the Arginine/Arginine genotype was low in cervical cancer women compared to the Proline/Proline genotype as has been reported in other Black African populations. There was no association between the Arginine/Arginine genotype and increased risk of developing cervical cancer.
497. Incidence of Deep Venous Thrombosis in Cervical Cancer Patients before Radiotherapy Treatment

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ABSTRACT

Background/Introduction

Cervical cancer is the commonest cancer amongst female Zimbabweans. Most patients present for radiotherapy treatment with locally advanced disease. HIV infection is common in cervical cancer patients. Deep vein thrombosis (DVT) in cervical cancer patients presents a great challenge to the treating team of physicians due to the high risk of bleeding in these patients during anti-coagulation treatment. Those patients who develop DVT before radiotherapy treatment may have a poor prognosis.

Aim

To determine the incidence of DVT in cervical cancer patients before radiotherapy

Methodology

Design and Setting

This was pilot study carried out at the Radiotherapy Centre, Parirenyatwa Hospital, Harare, Zimbabwe.

Participants

Study participants were 100 consecutive consenting patients referred for treatment with cancer of the uterine cervix.

Methods

All participants were offered a d-dimer test using Cobas 232 Point of Care System. Patients who had a positive d-dimer test and/or had clinical signs of DVT had a Doppler scan to confirm the diagnosis.

Results

Mean age of patients was 51, range from 32 to 84 years. Of the patients who were fully staged, only 12.8% (11/98) had early stage disease (FIGO stage less or equal to 2A). Positive d-dimer test results did not correlate well with positive Doppler scan results. DVT was diagnosed in 15% (15/100) of patients. There was no association between HIV infection and the risk of DVT noted in this study.

Conclusion

There is high incidence of DVT in patients with cancer of the cervix, and this may affect prognosis
498. Transactional nature of occupation: Caring for your own child with HIV

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UZ-CHS Department of Rehabilitation

ABSTRACT

Background

Various calls have been made within the occupational therapy profession to shift focus towards occupation. Gaining an understanding of peoples’ experiences of the occupations that they engage in is one way of shifting towards a focus on occupation. In Zimbabwe there is a growing population of mothers caring for their biological children who are infected with HIV. Many of these children present with HIV-related Neuro-developmental delays (NDDs). This study focused on exploring the experiences of Zimbabwean mothers caring for their child/ren with HIV related NDDSs.

Methodology

A descriptive phenomenological approach was used to uncover their lived experiences of caring for a child with HIV-related NDDs. Data generated from phenomenological interviews conducted with five mothers was analysed thematically using a simplified version of the Stevick-Colaizz-Keen method.

Results

The major themes; Resilient acceptance ‘Ndozvazviri’ and rekindled hope for the future emerged from the findings. The findings revealed the transactional nature of the mothers’ experiences of the occupation of caring for a child with HIV-related NDD. Personal factors interacted with contextual factors such as stigma, culture and socioeconomics to shape their caring experiences, making caring for their child a difficult and demanding role that they could not easily entrust to another.

Conclusion/Recommendations

The findings of this study encourage occupational therapists to consider carefully the transactional nature of occupation and how the mothering role positively shapes identities in the design of interventions for the mothers.
499. Rehabilitation Professionals’ perceptions of treating clubfoot using the Ponseti method

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UZ-CHS Department of Rehabilitation

ABSTRACT

Background
Clubfoot is the most significant foot deformity that develops in a foetus in the womb affecting approximately 1-2 per 1000 live births worldwide (Gavrankapetanović & Baždar, 2011). Worldwide, a conservative technique called Ponseti method is used to obtain and maintain correction of the clubfoot so that a patient has a functional, pain free foot with good mobility. Ponseti was introduced in Zimbabwe 4 years ago and it is now used in most healthcare centres after training of health professionals through workshops. This study’s aim was to get the perception of rehabilitation professionals on treatment of clubfoot using the Ponseti method.

Methodology
A Cross sectional descriptive study using convenient sampling method was used to gather data from 41 Rehabilitation professionals who were trained on the Ponseti method practising in Harare and Chitungwiza. A questionnaire with both open and closed questions was used for data collection. Data from open ended questions was analysed thematically. Data entry was done using Microsoft excel and analysed using simple descriptive methods.

Results
The study showed that all n=41(100%) Rehabilitation Professionals perceived the ponseti as an effective method in the treatment of clubfoot. Those who had previously used other methods 26(63%) revealed that they favoured the Ponseti method because it has better results than the method they have used before. Amongst challenges faced when using ponset method, 25(61%) agreed that caregivers were not compliant to treatment and a total of 22(54%) participants agreed that lack of knowledge by the caregivers of this new method was a challenge which hinders progress in treating clubfoot using ponseti.

Conclusion/Recommendations
Recommendations were that there is need to increase awareness of Ponseti treatment method for Clubfoot as well as decentralised the services to district hospitals to reduce costs for the caregivers and improve compliance.
500. Perspectives of caregivers towards physiotherapy treatment of children admitted with burns in central hospital in Harare: A cross-sectional study

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UZ-CHS Department of Rehabilitation

ABSTRACT

Background

Each year more than 300,000 human beings lose their lives from fire-related burn injuries only. In most cases, three quarters of those deaths are accounted to children below the age of 14 years old in low and middle-income countries. Besides death, burn patients face other greater challenges as more than a million survivors develop burn complications, which include contractures, scarring, physical impairments, and deformities. These problems eventually lead to handicap, stigmatization, and later in life affecting their quality of life. Paediatric burns affect not only the burn survivor but also the caregiver. However, most studies concerning burns focus on the epidemiology, complications, mortality rate, medical and physiotherapy management of burns and a few explore on the role of caregivers. In Zimbabwe, there is a dearth of literature exploring caregivers’ perspectives towards physiotherapy treatment on their admitted children with burns. Considering the important role caregivers’ play in the rehabilitation process of paediatric patients, this is a significant shortcoming and there is a need to consider their perspectives and expectations towards treatment received.

Objective

To determine the perspectives of caregivers towards the physiotherapy intervention being administered to their children.

Methodology

A descriptive cross-sectional study was used with participants conveniently derived from central hospitals in Harare, Zimbabwe. A reliable and content validated questionnaire was self-administered to a sample of 34 caregivers (mean age= 30, Standard deviation=9.87) with paediatric burns patients below the age of 12 years. Data analysis was conducted using Statistica version 12.

Results

Caregivers’ response rate was 91.1% (n=31). The majority of the caregivers (96.8%) indicated that physiotherapy was necessary for the proper healing of burns. Satisfaction with physiotherapy services in general in the ward was reported to be high among 93.5% (n=29) of the caregivers. However, 61.9% of the caregivers were not carrying out ward programmes at all as indicated by the supervising physiotherapists. There was a statistically significant association between caregivers perspectives on the importance of physiotherapy and the explanation of the treatment plan by the physiotherapists [X²(1)=12.90, p=0.01]. The majority of the caregivers stated that, “I’m satisfied with physiotherapy because my child is improving and getting better and she can now do some of the things that she could...
do before she got burnt” and “my child is healing well without disability.”

Discussion

Positive perspectives towards physiotherapy were portrayed, as all of the participants indicated that their children were improving on commencing physiotherapy and that they would all want to continue with rehabilitation regardless of being satisfied or not. There was a significant association between caregivers’ perspectives on the importance of physiotherapy and the explanation of the treatment plan by the physiotherapist to the caregiver prior treatment. However the results showed that about 32% of the caregivers believed physiotherapy made their children cry a lot all the times. It can therefore be assumed that the crying of the children might be one of the reasons why 42% of the participants were not willing to carrying out the ward programme. Procter et al (2010) stated that pain and crying is very common in rehabilitation but can be handled by encouragement and education.

Conclusion

Caregivers viewed physiotherapy treatment for burns as important and necessary for proper healing of burn wounds in children. The study found that it is important for physiotherapists to explain and educate the caregiver on the importance of physiotherapy prior to treatment as this determines willingness of the caregiver to participate in the ward programme.
501. Stress levels and factors associated with stress in outpatient stroke survivors: A case of St Giles Rehabilitation Centre.

Ndowa, P., Munambah, N.E.

UZ-CHS Department of Rehabilitation

ABSTRACT
Background/Introduction

Stroke is amongst the leading causes of death in the world and it is also the leading cause of disability amongst adults in the world. Recovery from stroke is usually coupled by both physical and psychological challenges, which predispose stroke survivors to stress. The effects of stress are very fundamental and can lead to very considerable changes such as being unable to perform activities of daily living thereby fostering dependence on other people. This study as aimed at determining the stress levels and factors associated with stress in outpatient stroke survivors.

Methodology

Consecutive sampling method was used to select thirty-nine (39) outpatient stroke survivors at St Giles Rehabilitation Centre. An adapted P-10 Perceived Stress Scale was used to calculate stress levels of each of the participants and a researcher administered questionnaires were used to collect data on the factors associated with stress in outpatient stroke survivors. Questionnaires were completed as the patients were waiting for treatment and after receiving their treatment. Data analysis was done using Microsoft Excel programme 2013 and Epi info version 7.

Results

The mean age of the participants was 61 years and a greater percentage of the participants 25(64.1 %) were female. Close to three quarters 29(74.4%) of the participants were experiencing their first ever episode of stroke. The average stress level was 21.28, with a standard deviation of 5.69 and a variance of 32.41. Out of the 39 participants, 20(51.2%) of the participants had high stress levels that warranted them for stress management sessions. The average stress levels for stroke survivors who were in their first year of recovery was 23.44 which was the highest, followed by those in their second year 20.92. The factors that were associated with high stress levels included attendance of medical review appointments (33(85.7%)) and being employed 25(65.2 %).

Conclusion

The challenges that come with surviving stroke predispose survivors to stress. The high level of stress noted in stroke survivors warrants the need for treatment and review programmes that assess and manage stress in stroke survivors.
ABSTRACT

Background/Introduction
Diabetes mellitus is a chronic metabolic disorder whose prevalence is on the rise worldwide. Treatments with allopathic medicines come with some disadvantages, which have necessitated the continuous search for alternatives. Scientific search for hypoglycaemic agents from medicinal plants as recommended by the World Health Organisation expert Committee has become even more imperative.

Aim(s)/Objective(s)
The root bark extract of Annona stenophylla that is traditionally used in the management of diabetes mellitus was screened for determination of the hypoglycaemic effects and possible mechanisms of action proposed.

Methodology/Design and Setting
In a laboratory-based experiment performed at the Department of Physiology University of Zimbabwe, powdered plant material was extracted separately with water, methanol or ethanol. Alloxan induced diabetic rat model was used to determine the extract’s hypoglycaemic effects. Extracts effects on glucose uptake were tested using established cell lines. Total RNA was isolated and using RT-PCR, glucose transporters 1 and 4 expression levels were quantified. Translocation of GLUT 4 was assessed using flow cytometry. Plant extract was screened for phytoconstituents, following which toxicity testing was done.

Main outcome Measure(s)
Blood glucose lowering effects, increased insulin levels through inhibition of enzymes and increase in GLUT 4 transporters.

Results
The pattern of decrease in blood glucose for A. stenophylla extract treated groups in alloxan diabetic rats was similar to the glibenclamide treated group (45 % and 46 % decrease respectively). Plant extract long term treatment showed a slight increase in serum insulin levels (0.19 ± 0.01 μg/ml). For carbohydrate metabolizing enzyme assays, the plant extract inhibited α-amylase activity (64 ± 3.0 %). In all glucose uptake assays, different concentrations of A. stenophylla plant extract showed an increase in glucose uptake. A. stenophylla extract was not associated with adverse effects during toxicity testing. Thin layer chromatography of the prominent band peak was proposed to be alkaloidal in nature and identification of the probable compounds was concluded to be either pentyl 2 pyridyl ketone or octyl pyridine.

Conclusions
This study confirms the ethnopharmacological uses of A. stenophylla suggesting that the aqueous extract acts through a combination of mechanisms indicating potential for diabetic products formulation.
ABSTRACT

Background
Nontuberculous Mycobacteria (NTM) are made up of highly heterogeneous bacteria that are found ubiquitously in various environmental sources (water, sewage, soil, food), animals and humans. To date, more than 100 species of NTM have been identified. Some of the mycobacteria are now known to be opportunistic pathogens in humans. Rapid laboratory identification of these bacteria at species level is therefore critical if infections are to be controlled appropriately. In this ongoing ambitious project, we are identifying species of NTM that are prevalent in cattle and humans in Zimbabwe using molecular methods.

Methodology
Cattle cow dung samples are being collected throughout Zimbabwe and NTM isolated and identified in our laboratory at the university. NTM isolates which are stored at the National Microbiology Reference Laboratory (NMRL) are also being identified in our laboratory. These isolates from NMRL were collected throughout Zimbabwe during the National TB survey of 2014 by the Ministry of Health and Child Care. DNA of NTM isolates is extracted and subjected to amplification by polymerase chain reaction before sequencing. Bioinformatics of the sequences is used for molecular identification of the mycobacteria to species level.

Results
So far from a small sample of 26 NTM isolated from cattle, the following NTM species were identified: M. neoaurum, M. fortuitum, M. goodii, M. arupense, M. septicum and M. elephantis. From a sample of 81 NTM isolated from humans, 40 (49.4%) were M. avium complex (MAC) species. The other 41 isolates (50.6%) were identified as M. lentiflavum, M. terrae, M. paraense, M. kansasii, M. moriokaense, M. asiaticum, M. novocastrense, M. brasiliensis, M. elephantis, M. paraffinicum, M. bohemicum, M. manitobense, M. intermedium, M. tuberculosis complex, M. parakoreense, M. florentinum, M. litorale, M. fluoranthavigatorans, M. sherrisii, M. fortuitum and M septicum. Two isolates could not be identified, but were closely related to M. montefiorene and M. phlei.

Conclusions
So far, we have identified several species of NTM in cattle and humans in Zimbabwe. Interestingly, most of the species are known to be opportunistic human pathogens and need great attention. Further studies are ongoing to ascertain the true diversity and prevalence of NTM in Zimbabwe.
504. Developing a curriculum for MBCHB students on point of care tests for medical diagnosis

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ABSTRACT

Objective

To develop a curriculum that ensures that MBChB students acquire the knowledge, skills and competency to appropriately utilise point of care tests POCTs

Methodology

The study involves performing a needs assessment and getting information from key stakeholders in the health sector. Data is collected by use of, a questionnaire, interviews, focus groups discussions, direct observations and literature review.

Design

Needs assessment study

Participants

Key stakeholders in the health sector

Anticipated outcomes

Results of the general needs assessment will be used to development curricular and strategies to prepare and give students the required knowledge, skills, attitudes and confidence to make full and effective use of appropriate point of care tests in various Zimbabwean health points of care settings.
505. Evaluation of Rapid One-Step Prostate Specific Antigen test against an established ELISA method

Nyamayaro T, Mujaji WB, Musarurwa C

UZ-CHS Department of Medical Microbiology

ABSTRACT

Objective

To evaluate the analytical performance of the rapid one-step immunochromatographic PSA assay against an established ELISA method

Methodology

Design

A comparative study conducted between June 2012 and May 2013

Setting

Department of Chemical Pathology, College Health Sciences, UZ

Samples

Serum sample left over from routine PSA testing

Results

The rapid test correctly classified 46 (97.9%) as negative (PSA < 4ng/ml) and 94 (95%) as positive (PSA ≥ 4ng/ml). However one (2.1%) sample and 5 samples (5%) were wrongly classified as positive and negative respectively. All 18 (100%) of PSA RDT performed on female samples were correctly judged as negative. Accuracy, sensitivity, specificity negative and positive predictive values of PSA RDT were 95.9%, 94.95%, 97.87%, 90.2% and 98.95% respectively. There was a strong positive correlation between the ELISA PSA values and the semiquantitative PSA values from the RDT (r=0.91)

Conclusion

The rapid one-step immunochromatographic test is a useful preliminary screening tool from which positive results could be quantified using the established methods and crude indication of the magnitude of PSA elevation can be obtained by semi-quantitative estimation. The test is cheap, simple to perform and avails results within a short period of time.
506. Serum S100B measurement as a diagnostic tool and prognosis predictor in head trauma in resource limited settings: Insights from Harare, Zimbabwe.

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2: UZ-CHS Department of Immunology
3: UZ-CHS Department Surgery

ABSTRACT

Objective

To evaluate serum S100B levels as an additional tool for traumatic brain injury (TBI) diagnosis in a resource limited setting.

Study

A prospective study

Setting

Parirenyatwa Hospital, Harare Zimbabwe.

Participants

90 consenting individuals: 50 TBI suspects (HIP), 20 healthy individuals (AHP) and 20 patients with non neurological conditions (NNCP).

Results

Participants’ median age was 33.0 interquartile range (IQR): 28-43 years, with more males than females being recruited (p=0.001). The major cause of TBI in this study was motor vehicle crushes (78%). Median S100B levels were significantly higher in TBI suspects compared to AHP and NNCP (p=0.001), with high levels associated with high mortality rate. A CT scan result positive for neurological damage and severe head injury based on the Glasgow Coma Scale (GCS) was associated with high serum S100B levels (p=0.003 and p=0.002 respectively). A serum S100B above 350pg/ml with a median of 442pg/ml was uniformly fatal.

Conclusion

Despite the small sample size, our study highlights the potential of S100B measurements in diagnosis and prognosis prediction for TBI cases in settings where CT scan is unavailable and or unaffordable.
507. The diagnostic utility of serum Neutrophil Gelatinase Associated Lipocalin in Acute Kidney Injury at a Central Hospital in a resource constrained setting

Mabaya L (Nee Chekenya), Musarurwa C, Gomo ZAR, Nyamayaro T

UZ-CHS, Department of Chemical Pathology

ABSTRACT

Objective

To determine the utility of serum NGAL as a biomarker of acute kidney injury in patients admitted into medical wards.

Methodology

Design

A comparison study done between Jan 2013 and May 2014

Setting

Parirenyatwa Central Hospital, Harare, Zimbabwe

Participants

Adult patients presenting with suspected acute kidney injury at Parirenyatwa Hospital,

Results

There was a statistically significant correlation between NGAL and urea or creatinine (r=0.85; r= 0.46 respectively). A significant inverse correlation was observed between NGAL and eGFR (r= -0.97). A NGAL value of greater than 600ng/ml of NGAL was highly predictive of renal replacement therapy (RRT) with an area under curve of 0.64

Conclusion

Serum NGAL measurement seems to be a suitable biomarker for AKI because it correlates closely with renal function and allows timely identification of high-risk patients. NGAL levels are a good estimator of glomerular filtration rate.
508. Host serum vitamin d levels and related gene polymorphisms in resistance and susceptibility to *Mycobacterial tuberculosis*

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3: UZ-CHS Department of Obstetrics and Gynaecology

**ABSTRACT**

An estimated one-third of the global population is asymptomatically colonized by *Mycobacterium tuberculosis* but only about 10% of these develop active disease. Questions arise whether some individuals are naturally more prone to developing active pulmonary TB (pTB) than others or whether other factors besides socioeconomic factors are important triggers for disease development. Genetic makeup of the host and bacterium has been reported as mediating immune response to TB.

Several genes have been reported to be associated differentially with susceptibility to TB in different ethnic groups. Among these are the polymorphisms of vitamin D binding protein (VDBP) and of the vitamin D receptor (VDR and serum vitamin D levels. Studies from different geographical settings have reported different findings. No such studies have been done in Zimbabwe so far yet the knowledge of the effects of serum vitamin D levels and different types of VDR or VDBP may contribute to the design of new therapeutic strategies including vaccine development. The objective of this study is determined the role serum vitamin D levels and polymorphisms of VDR and VDBP in determining resistance/susceptibility to pTB.

A case control study involving 532 study participants with confirmed human immunodeficiency (HIV) and TB status. The cases are 266 consenting participants with confirmed pulmonary TB and the controls are 266 participants with no pTB. Stratified sampling was used to enrol equal numbers of participants to generate the following participant strata pTB+ve/HIV+ve, pTB+ve/HIV−ve, pTB−ve/HIV+ve and pTB−ve/HIV−ve. Thus, serum vitamin D levels and the frequencies of the different genotypes will be compared across the four strata to determine association with pTB susceptibility.
Malaria Rapid test kits

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UZ-CHS Department of Medical laboratory Sciences

ABSTRACT
The mainstay of malaria diagnosis has been the microscopic examination of blood, utilizing blood films. More recently, modern techniques utilizing Plasmodium antigen tests or polymerase chain reaction have been discovered, though these are not widely implemented in malaria endemic regions. Rapid tests are still regarded as complements to conventional microscopy but with some improvements they may well replace the microscope. Many of the test kits used in Zimbabwe produced outside the country. Rapid technologies are simple and there is no reason why they are not tested and designed by local scientists, provided they are given support from industry, government arms and institutions of higher learning. There is a need and opportunity for accelerated growth in our health setting through development, evaluation and utilization of rapid tests. The antigens used in many currently available commercial assays include surface proteins such as: histidine-rich protein-2 (HRP-2). However, variants that escape monoclonal recognition have now been identified and may be responsible for false-negative tests. Hence the need to develop robust test kits targeting molecules that are stable such as: Plasmodium falciparum lactose dehydrogenase (pLDH), Plasmodium falciparum glutamate dehydrogenase (pGluDH) and Plasmodium falciparum DNA. Our research project will carry out experiments aimed at developing rapid test kits for diagnosis of malaria due to Plasmodium falciparum.
510. Trends of rubella incidence during a 5-year period of case based surveillance in Zimbabwe

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ABSTRACT

Background

Rubella is a disease of public health significance owing to its adverse effects during pregnancy and on pregnancy outcomes. Women who contract rubella virus during pregnancy may experience complications such as foetal death or give birth to babies born with congenital rubella syndrome. Vaccination against rubella is the most effective and economical approach to control the disease, and to avoid the long-term effects and high costs of care for children with congenital rubella syndrome as well as to prevent death from complications. Zimbabwe commenced rubella surveillance in 1999, despite lacking a rubella vaccine in the national Expanded Programme on Immunization, as per the World Health Organization recommendation to establish a surveillance system to estimate the disease burden before introduction of a rubella vaccine. The purpose of this analysis is to describe the disease trends and population demographics of rubella cases that were identified through the Zimbabwe national measles and rubella case-based surveillance system during a 5-year period between 2007 and 2011.

Methodology

Data from the Zimbabwe National Measles Laboratory for the 5-year study period were analysed for age, sex, district of origin, seasonality, and rubella IgM serostatus.

Results

A total of 3428 serum samples from cases of suspected measles in all administrative districts of the country were received by the laboratory during this period. Case included 51% males and 49% females. Of these, 2999 were tested for measles IgM of which 697 (23.3%) were positive. Of the 2302 measles IgM-negative samples, 865 (37.6%) were rubella IgM-positive. Ninety-eight percent of confirmed rubella cases were children younger than 15 years of age. Most infections occurred during the dry season.

Conclusions

The national case-based surveillance revealed the disease burden and trends of rubella in Zimbabwe. These data add to the evidence for introducing rubella-containing vaccine into the National Immunization Programme.
511. Characterization of Cryptococcus species in HIV-Cryptococcal meningitis co-infected patients in Harare, Zimbabwe

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ABSTRACT

Background

The invasive fungal disease cryptococcosis is caused by members of the basidiomycetous yeast genus Cryptococcus, although the existence of over a hundred Cryptococcal species only a few are able to cause disease. Identification of pathogenic Cryptococcus species is important in guiding management of patients as well as in describing their epidemiology. This study was aimed at characterizing Cryptococcus species in HIV-CM coinfected patients and their association with patient survival outcome.

Methodology

This was a descriptive longitudinal study, which investigated the prevalence and characteristics features of Cryptococcus species isolated from HIV-CM coinfected patients. This study was conducted at a tertiary teaching hospital in Harare in patients aged ≤18 years. Bio typing and genotyping assays were used to speciate the Cryptococcus isolates into species and sub-genotypes.

Results

One hundred patients with a median CD4+ count of 27 (interquartile range 12-50 cells/mm3) were enrolled. C. neoformans sensu stricto was isolated at prevalence of 77% (57), C. gattii sensu lato 17.6% (13) and inter-species hybrids 5.4% (4). Bio typing and genotyping assays had a good agreement in speciating the Cryptococcus isolates. The overall mortality was 49% and there was no association between the clinical outcome and isolated Cryptococcus biotype (p=0.306).

Conclusion

The study demonstrate the accuracy and reliability of bio typing methods in differentiating the different pathogenic Cryptococcus species causing HIV associated Cryptococcal meningitis in Zimbabwe and further supports the information gathered from other studies around the world.
Faculty of Commerce

Samuel M. Gumbe and Isaac Chaneta

ABSTRACT
Zimbabwean firms particularly those in manufacturing have been greatly affected by the opening up of the economy which has seen the influx of cheaper foreign goods. This has created intense competition for the sector as customers opt for the more affordable foreign products. The result of this competition has been the decline of capacity utilisation by the local manufacturers which has also been accompanied by firms closing down, retrenching staff or at times refusing to award salaries that match the poverty datum line as they seek to survive. On the other hand, employees faced with possibility of losing employment or earning low salaries have accused employers/managers of being self-centered in the decision making process. It is for this reason that this study was carried out to ascertain the extent of employee empowerment in Zimbabwe’s manufacturing sector. The study is confined to large scale manufacturers who are on Confederation of Zimbabwe Industries (CZI) register operating in Bulawayo, the 2nd capital city of the country. The study uses the qualitative approach and is case study of Bulawayo based manufacturers. Proportional representation is used to draw a sample 33 firms from 16 strata that make up the sub-sectors of the country’s manufacturing sector. The study findings reveal that the sampled firms are moderately high on engaging employees in empowerment programmes. However the findings also reveal that managers, to a large extent, treat employee contributions as only fairly important. Thus the study concludes that there are fairly low levels of employee empowerment in the sector in Bulawayo. The study recommends that as a way of raising employee levels of empowerment, the firms should adopt the Strategic Human Resources Management and the Total Quality Management Approach.
ABSTRACT
The purpose of this study was to establish product management strategies that can be employed by firms operating in a multi-currency economic system which is also experiencing depressed demand for consumer goods. The study was based on two cases of the largest consumer goods manufacturers in Zimbabwe. The study’s proposition was that the two firms had adopted aggressive product management strategies which made their products competitive. The results of the study were based on in-depth interviews with marketing executives in both cases and other field observations. The findings confirm that the firms operating in such a restrictive can survive by adopting aggressive product management strategies which include adding new product features, qualities and extending their product lines.

Key Words: deflation; product mix; product range; dollarization; product management
ABSTRACT
The manufacturing sector in Zimbabwe plays a critical role in the economic development of the country like employment creation, contributing to the country’s GDP and saving and generating foreign exchange. It is for this reason the Government of Zimbabwe (GoZ) has crafted a number of programmes aimed at rejuvenating it since it started to decline in the late 1980s. However the programmes seem to have benefitted foreign competitors as the sector experienced further decline resulting in the country becoming a net importer, capacity utilisation in the sector declining and unemployment rising as firms closed shop. This study sought to establish why the sector is failing to identify opportunities that are presented in the government initiated programmes thereby allowing foreign competition to benefit at their expense. The study sought responses from top managers of the sampled 68 manufactures from Bulawayo. The sample was drawn from the 16 sub-sectors that constitute the Zimbabwe’s manufacturing sector. Study findings reveal that the sampled firms have weaknesses in the way the scan the environment. The study is concluded by proffering relevant recommendations.
Challenges affecting establishment and sustainability of tourism public private partnerships in Zimbabwe

J.P. Sai, N. Muzondo and E. Marunda

ABSTRACT
Public Private Partnerships (PPPs) provide governments and businesses with a unique cooperation framework for mutual gain. The major goal of this paper is to identify the challenges influencing the establishment and sustainability of PPPs in the tourism sector in Zimbabwe. Nine variables impeding the establishment and sustainability of PPPs were identified from a critical review of existing literature. A survey of public and private sector organisations that participated in the 2013 edition of the Zimbabwe International Tourism and Travel Fair confirmed that only three of the variables in the theoretical framework were challenges. Consequently, the paper offers a tentative empirical model of tourism PPP establishment and sustainability with two sets of independent variables i.e. challenges and other variables. The academic implications for the study are that future studies should test the tentative model and investigate the determinants of successful PPP establishment and sustainability in general. At least two public policy implications for the government and its agencies can be drawn from this study. To successfully court businesses into PPPs the government needs to, ideally, take into consideration private sector views in fine-tuning its PPP policies. The government also needs to educate its administrative agencies to appreciate that PPPs can be established in any area including mega events and destination marketing.
516. Challenges affecting establishment and sustainability of tourism public private partnerships in Zimbabwe

Judias Peter Sai, Edmund Marunda and Noel Muzondo

ABSTRACT

Public Private Partnerships (PPPs) provide governments and businesses with a unique cooperation framework for mutual gain. The major goal of this paper is to identify the challenges influencing the establishment and sustainability of PPPs in the tourism sector in Zimbabwe. Nine variables impeding the establishment and sustainability of PPPs were identified from a critical review of existing literature. A survey of public and private sector organisations that participated in the 2013 edition of the Zimbabwe International Tourism and Travel Fair confirmed that only three of the variables in the theoretical framework were challenges. Consequently, the paper offers a tentative empirical model of tourism PPP establishment and sustainability with two sets of independent variables i.e. challenges and other variables. The academic implications for the study are that future studies should test the tentative model and investigate the determinants of successful PPP establishment and sustainability in general. At least two public policy implications for the government and its agencies can be drawn from this study. To successfully court businesses into PPPs the government needs to, ideally, take into consideration private sector views in fine-tuning its PPP policies. The government also needs to educate its administrative agencies to appreciate that PPPs can be established in any area including mega events and destination marketing.
ABSTRACT
This paper presents findings of a research that was carried out to establish the buying behavior of low density households in Zimbabwe and how they are influenced by the various forms of advertising. A questionnaire was administered to a sample of 75 respondents representing 75 households in Marlborough, Harare. The results of the study showed that 50% of the respondents strongly agreed that their decision to purchase a product was influenced by advertisements. They also indicated that they understood and preferred outdoor media more than television and print media which came second and third respectively in the order of preference. More than 75% of the respondents agreed that they bought advertised products more than those which are not advertised. The results also showed that consumers in Zimbabwe are slow in accepting and adopting the internet as a form of advertising. It can be concluded from this study that it definitely pays to advertise one’s products. It is also important that an advert should carry a strong message that is convincing to the consumers as indicated by 50% of the respondents. It can also be concluded that the Zimbabwean market has not yet fully embraced online advertising. The study recommends that outdoor media should be used more than any other forms of advertising in low density areas as it is the most preferred and most understood media choice. It is also recommended that since more women than men do the purchases for households in low density areas advertisements should target women more than men.
518. Effectiveness of visual merchandising on customer supermarket choice

Dr A Zinyemba

ABSTRACT
The retail market structure in Zimbabwe has changed from being a monopolistic structure to a perfect competition structure with many players coming in. It has become necessary now more than before for retailers to look at ways to influence customers’ supermarket choice decisions. Previous researchers have established that visual merchandising variable plays a greater role in influencing customer store decisions. This study aimed at establishing the extent to which visual merchandising variables influence customer supermarket choice decisions and at establishing which among the variables, are the most critical in customers’ minds in evaluating supermarket choice. The research was carried out in supermarkets around Harare Central Business District, Msasa and Ruwa. A descriptive survey method was used to get information from customers about their behaviours, attitudes and values. Systematic sampling was used to select the customers (respondents). A total of forty customers were surveyed representing the sample size. Results show that all visual merchandising variables affect customer store choice in varying degrees. Store choice decisions were also found to be influenced by other factors like customer care, promotions, prices, and quality of merchandise with customer care and prices being the most considered by customers in making their choice decisions. The study recommends that retailers should pay particular attention to all visual merchandising variables as results show that all variables have varying degrees of influence on customer store choice. Retail players must also pay more attention on product variety and displays and interior store designs which are the major variables that customers consider when making store choice decisions.
519. The enhancement of sustainable tourism education and training to primary school level and rural communities in Zimbabwe

E. Marunda

ABSTRACT
In a bid to mitigate adverse long term effects in biodiversity and loss of wildlife and to prepare communities for the challenges arising out of tourism and hospitality developments in their vicinity, it is vital that communities living next to tourist attractions be educated so that they practice eco-tourism or sustainable tourism as a matter of priority. This study postulates a model for the development of a curriculum for the education of primary school learners in Zimbabwe and for the training of rural communities living within or neighbouring tourism resorts and attractions. Such a curriculum should equip primary school learners and communities with the requisite knowledge to preserve and protect their environment effectively. Introducing tourism and hospitality education at primary school and community level augments benefits for school learners and rural communities.
ABSTRACT
Sustainable national development is determined by a country’s economic development, its people’s mind-set and their capabilities. Accordingly, an infrequent, minimised frequency of seminar discussions and conferences on research findings by both academia and industry, not only retards the rate of collaboration between the two, but grossly hampers a nation’s economic development as well as people’s standard of living. A critical review of literature and observations underlined the challenges faced in the potential collaboration of academia and industry in Zimbabwe. These include, a varied perception of research findings, misdirected national scholarships, limited opportunities for local academic publications, a few lecturer entrepreneurs, great variation between practice and theory of basic business concepts and business practices abating the guiding philosophy of Unhu /Ubuntu. The conclusion drawn was that, solving socio-economic problems through research by academia and industry takes second place to acknowledging unethical business conduct, which in fact deters academia and industry from collaborating with each other. It is advanced that to effectively promote the academia-industry collaboration, there is need to significantly increase the national research budgets and local on line publication opportunities for researchers. Other measures include implementing government policies designed to allow college and university lecturers run enterprises, increasing funding of technical entrepreneurship education, a well-balanced, transparent disbursement of local national scholarships and the creation of media space for nationwide discussions on research findings. Ultimately, the glue for the academia-industry collaboration lays in encouraging localised seminar discussions on research findings by students on attachment, their college and company supervisors, culminating in conferences for academia and industry.
521. Strategies for Enhancing 21st Century Global Literacy with Zimbabwe in Mind

*Ed. Marunda and El Marunda*

**ABSTRACT**

Global literacy rankings are based on basic literacy, which refers to the ability to read, write and understand in a local language. This traditional basic definition of literacy is in itself a deterrent from exploring and creating a wider literacy definition that also takes cognisance of functional and higher proficiency literacy levels within a wider curriculum context. Secondary research through a critical literature analysis has uncovered findings on the state of traditional basic literacy rates, on the global literacy ranking map. Relationships between traditional basic literacy rates and the economic development of a country have also been examined. Additionally, the secondary research findings also reveal strategies that enhance literacy levels such as e-learning, traditional reading, home schooling, business start-up programme, youth national service, on-line tertiary study programme, summer camps, entrepreneurship training, volunteer programmes and communication for development based research. To further enhance literacy, the article recommends extensive use of connectivity platforms facilitating e-learning and e-teaching, developing expanded home schooling and supporting communication for development based research.
522. Challenges Affecting Establishment and Sustainability of Tourism
Public Private Partnerships in Zimbabwe

P. J. Sai, N. Muzondo, E. Marunda

ABSTRACT
Public Private Partnerships (PPPs) provide governments and businesses with a unique cooperation framework for mutual gain. The major goal of this paper is to identify the challenges influencing the establishment and sustainability of PPPs in the tourism sector in Zimbabwe. Nine variables impeding the establishment and sustainability of PPPs were identified from a critical review of existing literature. A survey of public and private sector organisations that participated in the 2013 edition of the Zimbabwe International Tourism and Travel Fair confirmed that only three of the variables in the theoretical framework were challenges. Consequently, the paper offers a tentative empirical model of tourism PPP establishment and sustainability with two sets of independent variables i.e. challenges and other variables. The academic implications for the study are that future studies should test the tentative model and investigate the determinants of successful PPP establishment and sustainability in general. At least two public policy implications for the government and its agencies can be drawn from this study. To successfully court businesses into PPPs the government needs to, ideally, take into consideration private sector views in fine-tuning its PPP policies. The government also needs to educate its administrative agencies to appreciate that PPPs can be established in any area including mega events and destination marketing.
523. What determines the resilience of retail business in an unstable business environment? Evidence from Harare

Maxwell Sandada

ABSTRACT
Over recent years, a growing number of researchers and practitioners have developed an interest in the concept of organizational resilience. Amid the turbulent, complex and unpredictable business environment, organisational resilience is regarded as useful in helping organisations to thrive. The purpose of this study was to investigate the influence of organizational learning, innovation, organizational flexibility and business networks on the resilience of retail organisations in Harare, Zimbabwe. A quantitative approach was used in this study in which two hundred and three retail managers were randomly selected. The results indicate that both organizational learning and innovation have a statistically significant predictive effect on retail business resilience. The results also indicate that both organizational flexibility and business networks do not have statistically significant impact on retail business resilience. Therefore, to be resilient in turbulent environments, retail organisations need to create an environment that promotes learning and innovation.
ABSTRACT
The size of the informal business and the proportion of working people in this sector continue to grow in Zimbabwe. In order to expand its revenue collection base, the government intends to devise mechanisms to formalise the activities of this sector. However, little is known about the perceptions of informal traders on formalising business activities. To address the identified research gap, the current study sought to explore the perceptions of informal business owners about formalising their business activities. A qualitative paradigm was adopted using in depth interviews to collect data from a sample of 30 participants who were selected purposively selected. The interview transcripts produced four major themes namely: barriers to formality, informality benefits, informality disadvantages, and formality enablers. It became evident that informal traders are aware of disadvantages of operating informally and the benefits of formalising business activities. The results also indicate that entry barriers namely high taxes, tedious and costly registration procedures, corruption government and municipality officials, high rentals of business premises, lack of requisite skills and lack of access to finance inhibit the demand for formality. Recommendations arising from the results of the study and avenues for future research are made.
ABSTRACT
Faced with volatile business conditions and the hyper competitive market environment, SMEs are continuously focusing on finding ways to improve their performance. This paper attempts to establish the effect of mission and vision, environmental scanning and the formality of the strategic planning process on the performance of SMEs. A quantitative research approach was pursued through a self-administered survey questionnaire. Descriptive statistics, correlation analysis and regression analysis were used to analyse the data. The main findings of the study suggest that, the mission and vision statements, environmental scanning and the formality of strategic planning have a positive effect on the performance of SMEs. The formality of strategic planning emerged as the factor with a stronger impact on SME performance than environmental scanning and mission and vision. The study provides some practical insights for SMEs for improving their performance in line with the identified effect of these three factors. Ultimately, improving their performance along these factors is set to reinforce SME sustainability and which will further stimulate their profitability.
526. Voices from Zimbabwe on why men avoid literacy programmes

Dr Davidson Midzi

ABSTRACT
This article is a result of a study conducted in Mazowe district to determine factors that militate against men’s participation in the current Zimbabwean functional literacy programme (FLP). The study aimed to find out which factors in adult literacy programme played a role in shaping the attitudes, experiences and views of men to either take part or refrain. Flowing from the findings, a support strategy has been established to see to it that men receive continuous encouragement to take active part in adult literacy services. The research utilized the case study design based on purposive sampling technique to construct findings through the use of interviews. Through a semi-structured questionnaire and in-depth interviews with focus groups supplemented by observations, the writer was able to generate valuable information on why men avoid literacy programmes. The study has captured the voices of the respondents as to their perceived views regarding the factors militating against men’s participation in literacy programmes. Their voices are informative and could resonate with other voices elsewhere in Africa.

Furthermore, this was an important study because in order to retain male participants in the programme, it recommends that a supportive environment be put in place. Voluntary literacy tutors need to be trained in design and delivery of instruction as well as in mobilizing strategies, so that they are sensitive to male participants’ circumstances. The income generating projects in which men are currently involved, need to be made more viable in order to boost their morale.

Key Words: Voices, Zimbabwe, men, avoid, literacy, programmes
Describing attributes of competent school headmasters: A case study of ten school headmasters in Metropolitan Bulawayo Region—Zimbabwe

Madhlangobe, Lewis, Mawere, Virginia H., and Hungwe, Godwin

ABSTRACT
The purpose of this qualitative research study was to identify and describe specific leadership attributes related to outstanding SI leadership in Zimbabwean schools. The question that guided this study was; how do teachers name and describe the attributes of exceptional school leaders in Zimbabwe? Ten (10) school headmasters, 52-teachers, 81-parents and 82-students participated in this study. Literature reveals that most reported effective school leadership qualities were studied in contexts of developed countries but no study has specifically discussed results related to outstanding leadership in Zimbabwe. For this study we used questionnaires and interviews to collect data related to known cases from participants in Zimbabwean school contexts. Key findings revealed that the participants for this study reported that efficient school heads exhibit the following specific leadership attributes that enhance school improvement that they lead—(a) show clear knowledge, and understanding of cultures of people they lead, (b) exhibit outstanding communication skills and use of current forms of technology; (c) create healthy school climates; (d) create teacher-leadership teams; and (e) they encourage collective ethical decisions making strategies among others. We concluded that school leaders who influence improved learning outcomes and improvement of the schools foster communication skills that enhance workplace relationships that in turn help to uplift educational standards in their schools

Key Words: School Improvement, Leadership practices; Standards for school improvement; Effective leadership qualities; Leadership characteristics/attributes
528. Persistence, Perseverance, and Success (PPS): A case study to describe motivational factors that encourage Zimbabwe Open University (ODL) students to enrol, persist, and graduate with master’s and doctorate credentials

*Lewis Madhlangobe, Jennifer Chikasha, Onias Mafa, Primrose Kurasha*

**ABSTRACT**

The purpose of this qualitative study was to describe motivational factors that increased open distance learning (ODL) students’ capacity to successfully graduate with masters and doctoral credentials. Study background revealed that Zimbabwe Open University (ZOU) persistently experiences increased levels of student dropout and competition from conventional universities that introduce ODL through “block-release” programs. We used a descriptive qualitative research approach to collect and analyse data—hence, data collection through audio-recorded open-ended semi-structured interviews helped to maintain accurate accounts of data. We presented data through themed reporting enhanced by direct quotes from participants. Our research broadly concluded that once participants registered to study, perceived attention from various social angles created immense motivational factors ranging from institution motivators, personal factors, and social-generated motivators such as fear of what society would think of them all motivated them to persist and graduate with proposed credentials.
School improvement strategies: a case study to understand teacher self-reported experiences with effective leadership approaches used in primary and secondary schools in Zimbabwe

Dr. Lewis Madhlangobe, University of Zimbabwe; and Dr. Tawanda Madhlangobe, Seabrook College, Essex, UK

ABSTRACT
The purpose of this mixed methods study was to understand and describe self-reported experiences with effective School Improvement strategies used by school heads in primary and secondary schools. Focus group interviews and surveys with parents, school heads and teachers helped to inform the research questions identified for this study. The overall findings reveal that schools’ organizational efficacy is collectively achieved when school headmasters practice and implement instructional leadership strategies and behaviours gleaned through the following five broad professional growth-oriented themes emerging from this study: (a) using inclusive leadership strategies; (b) encouraging team-work among teachers; (c) teacher participating in collective information gathering to create a shared school vision; (d) and leadership helping to fulfill contractual agreements among teachers, students and parents; and (e) ensuring availability of instructional resources and technology. From the findings of the current study, we reached the general conclusion that information availability and processing at school level will always allow for increased collective participation by teachers in the school improvement (SI) agenda through the enhancement of holistic organizational learning power. Schools that learn as organizations improve fast.

Key Words: Collaborative efforts; School Improvement (SI); School Improvement Strategies (SIS); Organizational learning; Organizational effectiveness; Teacher professional growth
The power of culture in the teaching-learning approaches for teachers within the Zimbabwean context: A follow-up of the publication on Culturally Responsive Leadership (CRL)

Dr. L., Madhlangobe

ABSTRACT
The purpose of this theory to practice paper was to introduce and discuss the inclusive and responsive instructional teaching model that may be adopted to help Zimbabwean teachers to reduce the impact of learning problems related to diversity among students’ learning needs, leading to continuous development and school improvement. The context reveals needs for conceptualization of the philosophy that diversity in Zimbabwe is becoming a reality in the classrooms. Meanwhile, teacher training colleges and universities continue to produce teacher graduates with skills that fit the pre-independence era. Students’ under-achievement, drop-out rates and post-secondary unemployment reveals widening gaps between students’ learning experiences and instructional approaches. The model we suggest first introduces a need to understand that knowledge and reality about teaching approaches should be placed under continuous improvement. That approach has the potential to benefit teachers, professional development organizers, teacher-training curriculum and the policy makers—each group in its own diverse way. Learning for students from one grade level and school level to the next will show seamless benefits for students since instructors will uniformly show deeper understanding of students’ learning needs. Our broad conclusion and summary suggests that once teachers understand the role of culture in the way students process new information, they will use inclusive strategies that we perceive will help motivate students to learn effectively.
531. Self-perceived problems experienced by novice teachers: A descriptive case study of twenty-three Zimbabwean teachers

Dr. Madhlangobe, L

ABSTRACT
Educating children successfully is a relationship of behaviours that connect to teacher preparation and the work environment that the teacher performs in. Teacher credentials define the success of the teachers and that of the students that they teach. There is need to view student learning outcomes in the light of the teacher preparation levels. The purpose of this study is to find answers to the question, how novice teachers view their early experiences in the real early experiences? Findings of this study have the potential to respond help shape the teacher preparation curriculum to match the requirements of the modern Zimbabwe classrooms at primary schools level. The answers to the research question will attempt to satisfy the expected learning standards.

Key Words: curriculum implementation; teacher influence; student’s ways of knowing; students’ culture; and learning styles
Instructional practices that work with Zimbabwean high-school students in transitioning between topics: A qualitative case study with three outstanding of Physics, Chemistry and Mathematics teachers in the Midlands Province in Zimbabwe

L. Madhlangobe

ABSTRACT
The purpose of this study will be to answer the question, what works, and how do we know it works in the teaching and learning of critical science subjects? Educating children successfully is a relationship of effective teacher behaviours that help to bond teaching approaches to students successful learning outcomes. Findings will help influence other science teachers to use creative ways to influence students’ learning outcomes, interests in science and mathematics and increase teacher student creativity. Teacher influence on student learning outcomes determines national development. In Zimbabwe in particular, findings of this qualitative research study have the potential to respond help shape science curriculum delivery requirements to influence graduates who will help develop the national development.

Key Words: curriculum implementation; what works; teacher behaviours; students’ ways of knowing; learning outcomes; and learning styles
Evaluating the impact of parental involvement in learning outcomes: A report from secondary and primary school children and their parents in the Midlands Province in Zimbabwe

Madhlangobe, Madhuku, Chivandire & Nyakudya

ABSTRACT
The role of parents of parents in the success of their children is demonstrated in diverse ways. There is need to understand how parents value the importance of the success of their children. Similarly, describing the approaches that school leaders that succeed through involving parents in the education of their children is critical to the way educational leadership credential may be designed. Currently in Zimbabwe, there are many blame games that exist in the sphere of educating children. It is the purpose of this current study to collect qualitative data that may be used to initiate discussions on parental involvement

Key Words: parental involvement; ways of knowing; students’ culture; and learning styles
534. Coping with Global Warming: Using the Zimbabwean cultural and religious beliefs as human compliance behaviour determinants for reducing global warming

L Madhlangobe., & F. Machingura

ABSTRACT
The potential that indigenous knowledge has to inform the understanding of, and shape responses to climate change is showing increasing attention, especially if we embrace the view that scientific ways of knowing are less accessible to the rural majority. Perceptions around new knowledge and strategies for regulating and dealing with climate change are constructed, operationalized, and largely delimited to the narratives within the western domains. While Zimbabwean indigenous populations may not share equal responsibilities for the effects of climate change as their developed-world counterparts, responsibilities for future consequences rest in their human climate-change compliant behaviours. This co-authored paper aims to translate local theoretical appreciation of knowledge about causes of climate change into the practical daily lives of the Zimbabwean indigenous knowledge systems when contrasted with the western ways of understanding and strategizing to control climate change. The dialogue will be guided by the question; how do Zimbabwean indigenous people use their cultural and religious ways to adapt to current trends in climate change? Understanding indigenous people’s use of their combined cultural and religious knowledge systems to make sense of; and respond to climate change may offer innovative ways for directly engaging indigenous communities in practical partnership strategies and ethics for solving climate change concerns. It may help to integrate indigenous knowledge systems and interpretations of developing environmental processes to a collective strategy for fostering climate-change-compliant behaviours.

Key Words: indigenous ways of knowing; climate change; knowledge systems; culture; and religion
Denoting HIV and AIDS: the language of stigma in the Shona language

Liveson Tatira

ABSTRACT
This paper argues that language plays a very important role in human communication. Thus, language can be used in a positive way when it comes to HIV and AIDS issues. The paper argues that in denoting HIV and AIDS in Shona language, the terms used are not positive in fighting against the stigma of the disease. Language is best used in such a way that it creates hope for the people who are infected with HIV and AIDS. At the present moment, the language used to denote the illness leaves people helpless and disillusioned. The paper does not proffer alternative terms to denote HIV and AIDS for fear of being prescriptive but rather challenges society to discard terms which are in present use. By sensitising society of the negative terms, it is hoped that new and friendly terms would be generated by the same society which introduced the existing unpalatable terms. We take cognisance of the fact that terms generated by society itself are more likely to be acceptable and have a greater impact than those prescribed by the academics.
536. Depiction of polygamous marriage in selected pre-colonial Shona narratives

Liveson Tatira

ABSTRACT

This chapter examines the depiction of polygamous marriage in the pre-colonial narratives which are also referred interchangeably to as romances and Old World Novels in the discussion. An interrogation of the romances shows that the depiction of polygamous marriage is tainted with negativity. The men involved in polygamous marriage are portrayed as ruthless in their acquisition of women. The Shona chiefs are painted abusing their power, especially in the process of adding one wife after another. They risk the lives of their fighters as they wage fierce battles in order for them to capture women they want to marry.

In some instances, a polygamous man is depicted in a very unrealistic way, he is very weak administratively, drunkard, lazy and violent. All the expected attributes of a polygamous man are negated. The issue that polygamous marriage served a functional purpose in the pre-colonial period is not reflected and at worst distorted. The chapter, therefore, argues that the stereotypical unfavourable depiction of polygamous marriage in the Shona narratives is meant to serve a purpose. The narrative writers seem to be on a calculated mission of demonising polygamy in order to scare off readers who might be cherishing the practice. The writers might be feeding on the colonial myth that considers pre-colonial Shona marriage as deficit in moral values. The colonialists, through their writings about the Shona marriage, wanted Shona people to believe that prior to colonialism, they led a chaotic life, which illicitly begged for a colonial redemption.
The role of indigenous Shona cultural beliefs and practices in the conservation of the environment

Liveson Tatira

ABSTRACT
This chapter interrogates the role of indigenous Shona cultural beliefs and practices in conserving the environment. The chapter explores and investigates the importance of such beliefs and practices in conserving the environment. The chapter argues that the Shona beliefs and practices help to enforce environmentally friendly behaviour. It is through the beliefs and practices that the Shona people are discouraged from destroying their environment. There are a wide range of taboos, among other things, which are meant to conserve trees, animals, both domestic and wild, land, bodies of water and birds, to mention but just a few. The chapter argues that the conservation of the environment becomes effective because it is not human-policed but is perceived to be supernaturally enforced. Among the Shona people, supernatural enforcement becomes a way of life rather than a mere human externally cohesive force.
The Shona children traditional games

Liveson Tatira

ABSTRACT
This paper is an attempt to show the richness embedded in the Shona children games. The Shona children games if not properly analysed would pass for any other pastime activities for children. However, Shona children games were much more than pastime games. Through the various games, children were afforded the opportunity to exercise their bodies and keep them fit. Children games offered children a variety of skills and knowledge. Cognitive skills were developed as children got involved in games that challenged their cognition. Children learned issues of negotiation, skills to evade potential enemies, skills for quick problem solving and skills for dancing, all which were/are very important for their day to day survival. The games also taught them to live in harmony with others as well as to obey authority and to cooperate with others.
539. Zimbabwe’s ‘Four-Pathway’ Schools’ Proposal for Technical and Vocational Skills Development: Implementation Challenges, Benefits and Prospects

Hardy Chitate

ABSTRACT
The first Commission of Inquiry into Education and Training (CEIT) was instituted on 2 January 1998. The commission reviewed completely Zimbabwe’s education system against the background of the demands of the Third Millennium and made several recommendations. One of those recommendations was the establishment of a ‘four-pathway’ senior school system designed to develop technical and vocational skills among Zimbabwean students that are usable in their future formal employment or informal self-employment. Regrettably, the new education structure has not yet been fully implemented up to now. This paper makes a modest contribution to the on-going debate about challenges associated with renewed attempts to vocationalise secondary education in Zimbabwe. Through a critical analysis of related documents and interviews with key stakeholders, evidence is marshalled in support of the view that the innovative ‘four-pathway’ skills empowerment project, unlike Education With Production (EWP) of the 1980s, which failed to take off, is a product of a wide consultative process. Because of its commendably public approach, the innovation seems to enjoy a secure ground-base with the generality of Zimbabweans. However, chief among other factors in an apparent situation that exists in which some recalcitrant technocrats in the relevant ministries are prepared to scuttle what is arguably the best education system ever designed in the post-Independence Zimbabwe right at the shoals of its implementation. For, the proposed curricular change project has far-reaching implications for staffing in the affected ministries. At best, some of the key personnel may be redeployed, at worst retrenched. Hence the sluggish structural reform of the current Zimbabwean education system. The project has massive potential to increase supply of skilled manpower and participation of Zimbabwean future citizenry in the economic development of the country. Such a noble experiment at curriculum diversification, therefore, needs the full support of all Zimbabweans.
540. Interrogating the irrationality of the rational and child sexual abuse in Zimbabwe: The call for education for Hunhu / Ubuntu

Ngoni Makuvaza

ABSTRACT
This paper bemoans the current scourge of child sexual abuse as well as the recent disturbing phenomenon of female rapists bedevilling the nation. It is particularly disconcerting when it is reported that, “there are over 2000 child rape cases reported each year in Zimbabwe” (Daily News, Saturday 2, November, 2013). We consider this as a serious problem which needs urgent attention. However, it is our claim that, this scourge is concomitant with man’s broad search for ‘happiness’. Thus, we put it that; this insatiable search for happiness has regrettably created a dilemma or paradox for 21st century man in Zimbabwe. This paradox hinges on man’s incessant and insatiable thirst for rational goods (happiness) through irrational means. Essentially, this has culminated in what this study refers to as the ‘paradox of the rational’ or the paradox of the ‘irrationality of the rational’.

To interrogate this problematic malady, we posit the following theses: (a) there is need to revisit and ‘renegotiate’ the dominant perception regarding the rationality of man, (b) Zimbabwe is systematically sliding towards the ‘irrationality of the rational’, and lastly (c) it is not jails and stiffer penalties (not even ‘fencing’) on the offenders that can contain this scourge but probably a ‘cultural rationality’ anchored on chivanhu and hunhu. To this end, we posit education for hunhu / Ubuntu as having potential to address this problem. In this paper, ‘man’ shall refer collectively, to both male and female.

Key Terms: happiness, human nature, rational, irrationality, cultural rationality, group / communal rationality, education for hunhu, chivanhu, hunhu.
541. Chivanhu/Isintu and children’s philosophical dispositions to philosophise: Reflections on children’s inquisitiveness and a call for philosophy for children in Zimbabwe primary schools

Ngoni Makuvaza & Oswell Hapanyengwi

ABSTRACT
The thesis being defended in this paper is that, the disposition to philosophise is inherent in all children. However, this characteristic propensity is to a large extend, enhanced or compromised by the world-view in which the child is born and grows. Accordingly; among the Shona of Zimbabwe, we put it that this disposition is being seriously compromised by chivanhu. We present chivanhu as the world-view of the Shona as well as the indigenous black Africans of sub-Saharan Africa, from which arises their philosophy of life as well as the resultant sensibilities and consciousnesses. Necessarily, chivanhu conceived as a world-view of the Shona determines the manner they interrogate and interpret the world in and around them. To this end, we present three propositions, firstly; we think the school is strategically positioned to address this problem by emphasizing on dialogical as well as learner-centric pedagogy. Secondly; we urge that, the adult members of society who are the custodians of chivanhu should transform from being inhibitors to facilitators of children’s’ philosophizing. Essentially; we argue that, philosophy should be introduced into the primary school curriculum in Zimbabwe, because it also has potential to enhance the learning of the child in general.

Key Words chivanhu, hunhu, philosophising, gnosiological cycle, teacher-centric pedagogy, dialogical pedagogy
542. *Hunhu/Ubuntu* and the idea of Shona personhood: A tripartite perspective

*Ngoni Makuvaza*

**ABSTRACT**

The thesis defended in this paper is that; on the basis of Samkange and Samkanges’ presentation of the concept of hunhu/ubuntu, the Shona conception of personhood presented a conundrum. This was based on the claim that, the Shona seem to have a unique conception of personhood, which we considered as tripartite. Consequently, three types of vanhu (human beings or persons) among the Shona were identified, notably; munhuwo (mere human being), munhuwo zvake (mere person) as well as munhu kwaye (an ideal person). Essentially, these three categories of people were conceived as the basis for the stated claim for a tripartite view of personhood among the Shona. However, it was noted that ordinarily this sounded like illogicality especially to ‘outsiders’. Accordingly, this paper was premised on ‘unpacking’ this apparent obfuscation. To that end, the paper interrogated the three conceptions of a person identified above, which were posited as the basis of the tripartite view of personhood among the Shona.
ABSTRACT
The study investigated gender differences in academic /main subjects study at Madziwa, a primary school teachers’ college in Zimbabwe. The study focused on, inter-alia, trainee teachers’ choices of academic/main subjects, participation and performance in those subjects. The sample consisted of 77 student teachers and 17 lecturers. Amixed methods approach with triangulation was used to gather quantitative and qualitative data using questionnaires, semi-structured interviews, focus group discussion and document analysis. Findings indicated that: in performance there was no extreme qualitative difference between male and female trainees, but quantitatively males were distinctive in sciences and females in languages. Differential treatment of male and female trainee teachers by lecturers, trainees’ efforts and attitudes towards academic subjects also influenced the trainees’ performance. The study recommended increasing: the pool of main subjects from which trainees could choose, balancing gender when recruiting lecturers in order to have enough role models for the trainees and enrolling students and sensitising college stakeholders on policies of fair gender practices, in remedying the gender differences. Key Words: Gender differences, academic/main subjects, mixed methods research, triangulation INTRODUCTION The Constitution of Zimbabwe Act (2013) Amendment number 20, section 17,
544. Labelling of learners in Zimbabwean secondary schools: A psychological and social challenge

M. Rwodzi, K. Gotosa and F. Muchenje

ABSTRACT
This paper advocates for the (greater) utilization of Carl Rodgers’ humanistic principles in the post-colonial Zimbabwean classrooms focusing especially on (primary and secondary school) classroom practice, which includes learner identity, development and the language of instruction. The colonial classroom was by nature eurocentric (Mazonde, 2009), oppressive, dictatorial, prescriptive, task and teacher centred. But now that Zimbabwe is an independent state, the paper argues through a review of existing literature that the traditional transmission frameworks that guided colonial classrooms resulting in the production of dehumanized learners (Shizha and Kariwo, 2011), should be relegated to the dust bin to pave the way for greater engagement of humane ones based on humanistic principles which foster independence and freedom in the education system, particularly in the learners. Further, the paper advocates that classroom practice in post colonial Zimbabwe should be founded on the humanistic perspective which centres on the satisfaction of human interests, human culture, and fulfilment of human potentials and the democratic ideal of humanity as a whole, in its bid to re-Zimbabweanise/re-Africanise the learner in particular (and the education system in general). This should allow for maximization of the innate capacity of the student to achieve, create personal and social meaning, and become a valuable contributing member of the Zimbabwean society. Zimbabwean values enshrined in, inter-alia, our heritage; indigenous languages/mother tongues, ‘hunhuism’ and ZimAsset would be promoted resulting in the moulding of a Zimbabwean brand of a learner-cum- citizen who can hold his/her own amongst other peoples of the world.
ABSTRACT
The plight of persons with disabilities is a reality and conspicuously thrives in Zimbabwe. It is demonstrated by massive marginalisation in most areas of development. The employment sector is where such persons are most aligned. Solutions to this dilemma have remained elusive. Entrepreneurship, a process of starting one’s own business can be a mitigatory measure in transforming this undesirable tendency thus giving more flexibility to the disabled to control their working environments. This study attempted to identify ways in which people with hearing impairment could be empowered to become entrepreneurs. A theoretical perspective based on the Emancipatory Disability Model was used. A survey was conducted on fifty hearing impaired persons. Ten interviews to ascertain strengths, weaknesses, opportunities and threats that surrounded business establishment opportunities in Zimbabwe were conducted. Results showed that some of these persons were self-employed in small scale, non-sustainable businesses. These were vending activities on commodities such as vegetables, cell phone accessories and stationery. Their environment of operation was not stable. They needed technical training, advisory and financial support, to become fully established entrepreneurs.

Key Words hearing impairment, disability, entrepreneurship, employment, business, marginalised
ABSTRACT
The purpose of the study was to find out if primary school teachers knew that their curriculum was organised according to Howard Gardner’s Multiple Intelligences Theory. The study fell into the qualitative research domain. A case study was used in which only one rural school was purposively selected on the basis of ease of accessibility and convenience to the researchers. All the 11 teachers at the school participated in the study. Interviews and focus groups were used to collect data. The study established that teachers did not know that the primary school curriculum was organised according to multiple intelligences. Teaching concentrated on those subjects that are examined at the end of the seventh year course. Assessment was skewed towards the traditionally valued core subjects like English and Mathematics. Subjects like Art and Design, Music and Physical Education were not assessed at all. However, participants showed their keenness to develop and assess the traditionally neglected subjects if resources, facilities and support were made available.

Key Words: Curriculum, Multiple Intelligences, Challenges, Assessment, Facilities.
Grade seven pupils’ perceptions towards English composition tests as an instrument of performance measurement: A case study at Karoi Junior Primary School, Zimbabwe.

P.Goronga, T. Kufa, R. Gatsi and D. Gasva

ABSTRACT
This study sought to find out Grade Seven pupils’ perceptions towards English composition tests as an instrument of performance measurement. Twenty (N=20) pupils participated in the study. Questionnaires and interviews were used as data gathering instruments. The study established that, generally, Grade Seven pupils have positive perceptions towards English composition writing. It was also found out that teachers teach composition writing in their classes and it again emerged that handwriting of pupils influenced the award of marks by teachers. The study recommends that teachers should take advantage of pupils’ zeal to write English compositions by giving them as much practice as possible as well as giving timeous feedback on written compositions. There is also need by parents to take an active role in the education of their children by assisting them in English composition writing at home.
Developing strategies for the promotion of indigenous knowledge systems in Africa’s development: A perspective from the south

F. Muchenje and P. Goronga

ABSTRACT
This paper seeks to show the role of a reformed school curriculum in promoting the use of Indigenous Knowledge Systems and thus creating an appropriate technology base. An overview of the Marxist theory as a guiding theoretical perspective is also presented. The paper goes on to define Indigenous Knowledge Systems and their utility in medicine, agriculture, and nutrition and ethno veterinary science. The paper takes the position that unless the current education system is reformed so as to incorporate Indigenous Knowledge Systems, investment made in education will not bear much fruit. The significance of using different school subjects as vehicles for the transmission of Indigenous Knowledge has also been highlighted. The paper concludes the discussion by showing the challenges facing Indigenous Knowledge Systems where issues such as documentation (to preserve the Indigenous Knowledge Systems from being unnecessarily lost) and patenting (legitimatising ownership of Indigenous Knowledge Systems) are presented.
From whose perspective anyway? The quest for African disability rights activism

Tsitsi Chataika, Maria Bergs and Abraham Mateta and Kudzai Shava

ABSTRACT

In this chapter, we illustrate how disability rights are still framed within charitable and neo-colonial approaches. We expose the links between the disabling norms and values of neoliberalism, and how rights become included in development discourses and debates (i.e. linked to poverty reduction work). We, thus note a top-down flow of information, terminology and discourses of ‘rights’ and ‘empowerment’, which pander to a stratification of Africa, and stereotypes of disabled people in particular, as on the lowest levels of global society. Using examples from Southern and West African contexts, we show how the existence of external and internal gate-keeping and tokenism, as opposed to an open debate on genuine disability mainstreaming and inclusion. This is linked to the ways in which ‘rights’ discourses are becoming commodities used by donor-linked funding and programme cycles for development aid. While a lot of hope is on the Convention on the Rights of Persons with Disabilities, we show how genuine partnership is rarely achieved. Rather, there is a focus on ‘soft’ rights. In reaction to this, we challenge the African disability movement and its allies to reclaim notions of rights in their own terminology (i.e. Ubuntu), and work on ‘hard’ rights, leading to change in policy and practice. Our quest is to push for a legitimate ‘marriage of commitment’ between the global north and Africa in the rights debate. We believe that it is from this form of African renaissance that can emancipate the disability movement in Africa. Eventually, we hope that social justice, empowerment and genuine partnership would promote African disability rights, and ensure the realisation of the post-2015 sustainable development agenda.
ABSTRACT
This ‘must read’ book presents an accessible, personal style and diverse content, which is clearly a reflective product of conversations, ideas and experiences Arlene Kanter has shared with several people in the fields of disability and law. She provides unique insights into the Convention on the Rights of Persons with Disabilities (CRPD) and how it evolved from its foundation as an international legal framework. A unique feature of this book is the author’s involvement in the CRPD generation process. Hence, the narrative reflects upon all aspects of the CRPD from personal and interactive perspectives. The author’s personal experiences clearly exhibited in this book, sets it apart from most disability rights texts, while at the same matching well-thought out academic writings. In this book, Arlene Kanter examines the status of the rights people with disabilities under the international law prior to the adoption of the CRPD. She further critically analyses the CRPD drafting process, its potential for achieving disability rights and its complexities from an insider’s perspective. This is so because Kanter made known her participation in the CRPD drafting process, an aspect that significantly enriches this text. Kanter further argues that by articulating what she refers to as the ‘new human rights’ (for example, the right to live in the community, accommodations and support) as well as new interpretations of existing human rights (for example, liberty, security, integrity, access to justice and freedom from torture and ill-treatment), the CRPD is not only significant for people with disabilities, but for the general development of international human rights law. Kanter strongly believes that the success of the CRPD rests on the extent to which individual countries enforce their own domestic laws and policies, guided by this international instrument. Apart from domesticating the CRPD, Kanter also takes the changing of societal attitudes towards people with disabilities as a critical element in ensuring access to disability rights.
551. Global institutions and their engagement with disability mainstreaming in the south: development and (dis)connections

Tsitsi Chataika and Judith A. McKenzie

ABSTRACT
With the increase of disability activism internationally, various global institutions and international development organisations have started to mainstream disability in their work, mostly at the level of rhetoric. Many have also developed disability statements and policies to guide their work. This chapter explores these developments, examining what strategies such organisations have adopted to introduce the disability strand in their work. At the same time, we provide a critique of how efforts at mainstreaming or including disability in their work is translated into practice. In the process, we expose some barriers that continue to maintain disability on the peripheries of inclusive development; and practices that sometimes may work to the detriment of disabled people’s emancipation. We also briefly reflect on the World Report on Disability, exploring the possibilities of it being used as a catalyst to the institutions’ disability mainstreaming efforts. We draw on additional examples emerging from Africa where we reside, in the search for promising practices, where there is genuine disability mainstreaming by international agencies in trying to understand disability as an ubuntu and development agenda.
Faculty of Veterinary Science

552. The epidemiology and ecology of *Bacillus anthracis* infections (anthrax) in wildlife/livestock interface areas in Zimbabwe

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**ABSTRACT**

**Problem Statement**

This is an epidemiological study of anthrax at the wildlife / domestic livestock / human interface areas in Zimbabwe. The project is aimed at studying the incidence and pattern of anthrax outbreaks in wild and domestic animals at the interface and establishing the possible role of each animal species in disease propagation. Samples will be collected from known past anthrax carcass burial sites to isolate and identify the bacterial strains and elucidate the relationships of the various isolates by molecular techniques (molecular epidemiological study). Similarly, samples will also be collected from fresh cases as may occur during this project. Both wild and domestic carnivores will be studied through serology for their potential as sentinels for anthrax in the range. The project has three study sites namely, Great Limpopo Transfrontier Conservation Area (GLTFCA), Kaza-Kavango TFCA and Mana Pools each with three interface types denoting intensity of animal species interaction - porous, semi-porous and amorphous. These interface types alongside environmental and meteorological factors will be taken into account in this study for the better understanding and control of anthrax at the interface.

**Expected outputs / or outcomes from the research:**

The research will lead to a better understanding of the interaction of factors in the epidemiology and ecology of anthrax at the wildlife / livestock interface. This will improve predictability of anthrax at the interface and therefore enhance timely preemptive measures such as vaccinations to save domestic livestock and endangered wild animal species at the interface. This way, wildlife conservation alongside profitable livestock production will be promoted while also minimizing an important zoonosis from infecting humans. Further, the identification of *Bacillus anthracis* strains will lead to better understanding of the epidemiology of anthrax at the interface vis-à-vis the differential impact on animal species. The *B. anthracis* strains obtained will add to the global pathogen gene bank maintained by the world Organization for Animal Health (OIE) for development of diagnostic tests and vaccine development.

Other outputs will include improved surveillance for anthrax for better disease prevention measures, at least four publications in referred journals and a Doctor of Philosophy degree awarded by the University of Zimbabwe.
Milk production in goats on veld hay supplemented with selected legume forages

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ABSTRACT

Problem: Nutrition is a major constraint in smallholder livestock production; hence, the use of alternative sources becomes essential. Snyman, (2010c) observed lower kid mortality in supplemented does compared to those not supplemented during lactation. Alternative affordable sources of feed such as forage legumes that provide protein, vitamins and mineral elements, which are lacking in mature natural grassland pastures, especially during the dry season (Baloyi et al. 2008), can be an option. Therefore, this research was designed to investigate the effects of supplementing Desmodium uncinatum, Mucuna pruriens and Vigna unguiculata forage legumes to low quality veld hay on milk production in indigenous goats.

Findings: There was significant (P<0.05) difference in the milk yield of the goats on different treatments. Milk quality parameters were not significantly different (P>0.05) among goats on different treatments. Daily live weight loss was significantly higher (P <0.05) in goats on diets supplemented with Cowpea compared to the commercial goat feed, Silverleaf desmodium and Velvet bean. Feed conversion ratio was highest in goats supplemented with the Silverleaf desmodium, followed by Cowpea, however, they were not significantly different (P >0.05). These supplements have high protein level. Animal suffer from malnutrition in dry season thus affecting their potential performance. Hence the use of these feeds lead to better performance.

Expected outcome: The three selected legume forages used reflect that they can provide good quality forage for use as supplement to relatively low quality basal diets of veld hay on animals in the smallholder communal areas. Milk produced by these indigenous goats has unique characteristics (higher fat and protein content) making it better than the milk of specialised dairy goats.
554. Occurrence of zoonotic viruses of importance among bat populations in Zimbabwe and the risk factors involved

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Professor Gift Matope - UZ Faculty of Veterinary Science
Professor Lovemore Gwanzura/UZ College of Health Sciences
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COLLABORATING INSTITUTIONS/PARTNERS:
CIRAD Agricultural Research for Development
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SUMMARY/DESCRIPTION OF PROJECT
Bats have been recognized as carriers of important disease-causing zoonotic agents, such as rabies and filoviruses (Ebola and Marburg). These viruses can be transmitted directly from bats to people, or via livestock and companion animal host, or they can be transmitted indirectly via fomites. The study aims to identify zoonotic viruses in circulation among bat populations in Zimbabwe, the role of ectoparasites in viral transmission, seroprevalence among the human population at risk and the risk factors involved in the transmission of these viruses. A total of one thousand, two hundred blood and tissue samples will be collected from six bat species at specific sites, namely *Eidolon helvum*, *Epomophorus wahlbergi*, *Rousettus aegyptiacus*, *Nycteris thebaica*, [*Micropteropus pussilus* & *Nycteris cambiensis*]. Ectoparasites found on the bats will also be collected. Blood samples will be collected from persons within the local community on a voluntary basis that is in-contact with infected bats populations. The serum samples from both bats and human will be tested for the presence of antibody using the ELISA, and the bat tissue samples and ectoparasites, will be tested for the presence of the viral genome using the RT-PCR, for both lyssaviruses and filoviruses. The risk factors involved in the transmission of zoonotic viruses from bats to human and domestic pets will be determined through the administration of a questionnaire among the local community.
555. Pharmacological and phytochemical studies of some Zimbabwean Ethnoveterinary medicinal plants used for animal wound management

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Dr S Khoza - Pharmacology College of Health Sciences University of Zimbabwe
Prof. T Mduluza - Biochemistry University of Zimbabwe

ABSTRACT
This research project is focussed on the development of local or indigenous knowledge systems for the enhancement of public health and animal welfare. It was motivated by the realization that modern/conventional medicines though effective have disappointed many especially on issues to do with drug resistance, side effects and/or adverse drug events among other negatives associated with modern pharmaceuticals. Communities have knowledge systems passed from generation to generation that have sustained both human and animal life. Also it is important to note that many (humans and/or animals) world over are relying on herbal medicines form their primary healthcare needs. It is also factual that most modern medicines were derived from nature. The knowledge and practises in communities will guide much of the research activities to be done particularly which plants to investigate, methods of extraction, methods of assay, potential uses as well as possible drug developmental pathways to follow. Pharmacological (e.g. antimicrobial, anti-inflammatory, mutagenicity, etc.) and phytochemical (qualitative and quantitative) studies will be conducted on Cissus quadrangularis (Muvengahonye or Murunjurunju) steam and leaf, Adenium multiflorum (Chisvosve) and Erythrina abyssinica (Mutiti) bark and leaf extracts. Isolation and possible identification of promising compounds will be done. Also samples will be collected in a way that will minimize the impact on results of variations due to issues like seasons and geographical locations. Clinical trials will be conducted on relevant samples.
ABSTRACT

Babesiosis is a disease of worldwide significance and there are 12 Babesia species affecting dogs. Three main subspecies of large Babesia infect dogs – B.canisvogeli, B.caniscanis and B.canisrossi, each transmitted by different vectors and differing in pathogenicity and geographical distribution. B.canisvogeli and B.canisrossi are thought to be endemic in Zimbabwe but no research has been done to confirm this. The small babesia, B.gibsoni and B.anna (B.microti-like) are thought not to be present in Zimbabwe. The main vectors of B.canis are Rhipicephalus sanguineus and Haemaphysalis leachi. Transmission to the vertebrate host is through saliva during blood meals, and the sporozoites directly infect red blood cells. The severity of babesiosis in dogs ranges from subclinical infection to mild anemia to widespread organ failure and death, depending largely on the Babesia species. Other factors include age, immune status and concurrent illness. The most common clinical signs of babesiosis are hemolytic anemia and thrombocytopenia. Imidocarbdiproprionate and diminazaineaceturate are the most widely used anti-piroplasm drugs and can be supported with IV fluid s and blood transfusions Babesia specific species present and causing disease in Zimbabwe are not known. No research has been done on the presence of specific species of Babesia in Zimbabwe. Babesiosis is one of the most important vector-borne diseases in Zimbabwe and the presence of different species presents a significant challenge to practitioners with regard to diagnosis and therapy.

Information from this study could aid the development of vaccines.

• Vaccination against babesiosis is registered in some countries but cross-immunity studies have shown that there is little or no cross-protection between the Babesia species due to antigenic differences. (Kramer, 2009)
• Combination vaccines show greater protection against heterologous challenge (Schetters et al, 2001), and have been developed in South African and Japan, but without confirmation of the species prevalent in Zimbabwe, there is the risk of introducing new species into the country

Main Objective: To characterise the Babesia species present in ticks found on dogs in Chinamora, Zimbabwe by PCR

Objectives

1. To determine the occurrence and prevalence of Babesia canis in ticks removed from dogs
2. To determine the Babesia canis subspecies present in ticks in Zimbabwe
**Methodology:** Babesia species will be determined by PCR in ticks collected from dogs in Chinamora.

**Expected outcomes:** Prevalence and types of babesia species causing babesiosis in dogs will be determined.
557. Role of mechanical vectors in the transmission of *Anaplasma Marginale* in Zimbabwe.

*Dr Mudavanhu Nyagura*

**ABSTRACT**

**Problem statement:** *Anaplasma marginale* in Zimbabwe is transmitted by *Boophilus*. Mechanical vectors are also reported to play a significant role in the transmission of *Anaplasma marginale*. The role of mechanical vectors has not been quantified and experiments to determine the relative efficiency of transmission of the boophilus ticks and the mechanical vectors have not been done in this country. Control measures against anaplasmosis in this country are mainly targeted at controlling the tick vector and little attention to mechanical vectors for example tabanid flies without any data on relative efficiency of transmission of the parasite by these different vectors. Little is known about the genetic diversity of *A. marginale* isolates within individual herds in Zimbabwe.

**Expected results:**

The following data is expected from this study:

- The genetic range of *anaplasma marginale* in Zimbabwe
- The relative efficiency of transmission of *anaplasma marginale* by the *boophilus microplus* tick and the tabanid flies
558. Morphological, biochemical and behavioural effects of Boophonedisticha administration in induced neurodegenerative amnesia animal models

Ellen Mwandiringana

ABSTRACT
The specific cure for amnesia of Cognitive Dysfunction Syndrome and Alzheimer’s disease is still unavailable and under investigation. However, prevalence of the conditions is increasing since modern medicine has increased the life span across many species. There is need to approach this situation at various angles including herbal options. Despite vast literature on traditional applications of Boophonedisticha for memory enhancement, the mechanism of action is not known, hence the need to investigate this aspect as well.

Histological sections of the hippocampus were evaluated for dentate gyrus arm width, cellular layers, cellular morphology and mature, immature, apoptotic, astrocytes and microglial cell counts. The sections for all the groups showed two molecular layers of the dentate gyrus with upper and lower granule cell arms made up of mature, immature, astrocyte, microglia and apoptotic cells all compactly packed in layers. Between the arms was the hilus with pyramidal cells (large cells with long processes), astrocytes and microglial cells.

Results revealed that low dose B.disticha (10mg/kg) caused increased number of immature cells indicative of neuro-regeneration and is consistent with histological findings of Fluoxetine treated rats. High doses of B.disticha showed high number of mature cells, apoptotic cells and low number of immature cells suggestive of unabaitedneurodegeneration.

In conclusion, B.disticha hydroethanolic extract has a potential to treat neurodegenerative diseases at low doses (10mg/kg) because it caused neurogenesis in neurodegeneration-induced rats. However neurogenesis could not be solely attributed to B.disticha therapy, therefore it is recommended that immunohistochemistry be conducted in further studies to mark cells produced due to B.disticha therapy.
ABSTRACT
Problem statement: There is a paucity of information with regards to farmers’ perceptions, attitudes and usage of drugs with regards to the disease. Knowledge of these attitudes, perceptions and options will assist animal-health decision makers in developing optimum control and management strategies for bovine dermatophilosis.

Findings
The results showed that 45.4% of the herds were clinically positive for dermatophilosis and most farmers (79.5%) were generally aware that dermatophilosis was a cattle disease. In the event of a dermatophilosis outbreak in a head, 74.1% of the farmers treated their cattle using antibiotics, the proportion of farmers treating cattle did not differ (p > 0.05) across the diptanks. Fifty-two farmers (52/63) indicated that drugs had to be administered four to seven times before an animal recovered from infection. Tetracyclines were the antibiotics used by most farmers (79.3%) to treat dermatophilosis with 19.1% using penicillins. There were concerns raised by farmers about the effectiveness of these drugs against bovine dermatophilosis. Across the study sites, 48.6% and 27.6% of the farmers perceived bovine dermatophilosis to be an important disease at herd and area level respectively. A small proportion (12.4%) of the farmers regarded bovine dermatophilosis as a potential zoonotic disease. The high level of stockowners’ general awareness, with regards to bovine dermatophilosis sets ideal conditions for the mobilization of farmers by animal health authorities, in the control of the disease. Further research however needs to be undertaken to investigate effective antibiotic delivery protocols and the potential zoonotic impact of bovine dermatophilosis in a situation of high disease prevalence.

Expected outputs: Influence policy and direction to be taken with regards to farmer training and management of dermatophilosis
560. Risk factors associated with clinical dermatophilosis in smallholder sector cattle herds of Zimbabwe at the A. variegatum and A. hebraeum interface

D.N. Ndlovu and P.J. Masika

ABSTRACT

Problem statement: In Zimbabwe, research on bovine dermatophilosis has been conducted focusing on its control, prevalence and distribution (Chatikobo et al. 2001, Chatikobo et al. 2004, Chatikobo et al. 2009). Potential risk factors related to bovine dermatophilosis and its association with A. variegatum and A. hebraeum ticks have not been reported.

Findings

A cross sectional study was conducted to investigate factors for clinical dermatophilosis herd level positivity in smallholder dip tanks from Gokwe (Chemawororo, Gwanyika), Kwekwe (Koronika) and Chegutu (Chivero) Zimbabwe between September 2013 and April 2014. A total of 185 herds were clinically examined for disease and tick infestation. Amblyomma variegatum and A. hebraeum ticks were identified in situ with further laboratory confirmation. The potential herd-level risk factors for clinical dermatophilosis were tested using multiple logistic regression with herd infection status (positive, negative) being the binomial outcome and risk factors being predictors. Of the herds examined clinical bovine dermatophilosis was detected in 45% (84/185; 95% CI: 38.2, 52.6%) of the herds. The herd prevalence ranged from 6.9% (95% CI: 0.00, 16.7) to 56.7% (95% CI: 43.8, 69.6) with Chivero and Chemawororo dip tanks recording the lowest, and highest prevalence respectively. Herds infested with A. variegatum were associated with higher odds (OR= 6.8; 95% CI: 1.71, 27.10) of clinical dermatophilosis while the association was not significant (P > 0.05) in A. hebraeum infested herds. A history of having bought cattle (OR=3.5; 95% CI: 1.09, 11.12) compared to not buying was associated with increased herd clinical positivity status. It was concluded that management practices aimed at movement and tick control would help reduce the prevalence of clinical dermatophilosis in cattle herds.

Expected outputs: Animal health decision makers are informed on potential risk factors for dermatophilosis and on how the disease should be managed.

Key Words: Fisher’s exact test, ticks, exudative, univariate
561. Analysis of fat-soluble vitamins in milk by spectrophotometry

C. Mascara

ABSTRACT
Measurements of vitamins A, D, E and K in milk and milk products is being attempted using spectrophotometry as an alternative to more expensive methods like HPLC. This will enable scientists to track the deterioration of milk from milking to consumption, and also verify the data on infant milk fortification.
562. PROMISE: Efficacy and Safety of Two Strategies to Prevent Perinatal HIV Transmission

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University of Zimbabwe

ABSTRACT

There are limited clinical trial data comparing the efficacy and safety of antepartum (AP) antiretroviral (ARV) regimens for prevention of mother-to-child transmission (PMTCT) in women with high CD4 counts.

PROMISE 1077BF/1077FF is an on-going, prospective, open-label randomized trial being conducted in 14 sites in Africa and India among HIV+ pregnant and postpartum women with high CD4 counts. The trial has 3 randomized components, assessing the maternal and infant efficacy and safety of ARV PMTCT strategies during 3 periods: pregnancy through 14 days postpartum; breastfeeding; and after MTCT risk is over. The AP component compared a zidovudine (ZDV)-based regimen (Arm A: AP ZDV + single-dose nevirapine (NVP) at delivery + tenofovir (TDF)/emtricitabine (FTC) tail) and two triple ARV regimens (Arm B: ZDV-lamivudine (3TC) + lopinavir/ritonavir (LPVr); Arm C: TDF/FTC + LPV-r). Efficacy analyses using infant Roche 1.5 PCR, compared MTCT in Arm A to the pooled triple ARV arms. Safety analyses compared all 3 arms. Since Arm C was only open to all women in protocol Version 3 (V3), comparisons of Arms A and B included all women, but comparisons with Arm C only included those randomized under V3.

On 11/4/14, the Data Safety Monitoring Board recommended release of interim AP data through 14 days post delivery. As of 9/10/14, 3529 pregnant women had enrolled, including 1230 women in V3, and 3234 live births had occurred. Baseline median maternal age was 26 years; 97% were black African; median enrollment gestational age was 26 weeks; 97% were WHO Clinical Stage I; median CD4 was 530 cells/μL and 58% had CD4 ≥500 cells/μL. The Table shows significantly reduced MTCT with triple ARVs during pregnancy compared to Arm A. There were no maternal deaths. We found significantly higher rates of Grade >2 maternal chemistry events and moderate adverse pregnancy outcomes with either triple ARV arm compared to Arm A; but no significant differences in very preterm delivery (VPTD) <34 weeks, very low birth weight (VLBW) < 1500 g, or early neonatal death between Arm A and either triple ARV arm. However, among 1229 enrollees in V3, ZDV/3TC+ LPV-r was associated with significantly lower risk of neonatal death or VPTD than TDF/FTC + LPV-r.

These results provide the first clinical trial evidence to support the current WHO PMTCT Recommendations for use of triple ARVs during pregnancy. The safety findings require further study.
ABSTRACT
A phase III, dual-arm, open-label, randomized, non-inferiority study for participants who were on a failing NNRTI-containing first-line regimen. At study entry, all participants discontinued their failing NNRTI-based regimen and switched to one of the following arms, randomly assigned in a 1:1 ratio; lopinavir/ritonavir (LPV/r) plus raltegravir (RAL) or LPV/r plus best available NRTIs.

Purpose: The main purpose of the study was to determine whether the combination of LPV/r + RAL was associated with virologic efficacy that was non-inferior to that achieved with LPV/r + best-available NRTIs by 48 weeks of follow-up. The study also assessed the safety and tolerability of the two regimens. The programmatic intention of the study was to provide information that is applicable to the vast majority of resource limited settings where resistance testing is not used routinely for selection of second-line regimens and where PIs not needing refrigeration are preferred.

Status (completed/ in progress): Completed results pending

ABSTRACT
Smallholder farmers play a significant role in achieving sustainable food security and nutrition. Though they operate on a small-scale, smallholder farming has far larger impacts on several key social aspects such as health, nutrition and employment. In addition to this, historical evidence shows that smallholder agriculture, if adequately supported by policy and public investments, also has the capacity to contribute significantly to economic growth, employment, and poverty reduction. The underperformance of the formal economy, evidenced by company closures, has seen many people resorting to buying and selling commodities, especially agricultural produce. Some urbanites have returned back to rural areas where smallholder subsistence farming is the predominant activity.

This study focuses on developing and advocating for mechanisms that will result in increased smallholder farmers’ market participation through market-based evidence. The research takes into account the opportunities and hindrances to market access, which could be the reason for the mismatch between supply and demand for produce in the market. It is intended to add to the body of knowledge on effective strategies to enhance smallholder agriculture and provide policy options to effectively support the food and nutrition cluster of the national economic blueprint, ZimAsset.

The study employs both qualitative and quantitative analysis of information from literature review as well as stakeholder consultations. Literature review was mostly confined to general problems affecting smallholder market participation, based on previous work around the world and in Zimbabwe. The findings were then contextualised to undertake a survey of farmers in three key farmers’ markets of Harare (Mbare and Lusaka (Highfields)), Bulawayo (main markets in town), Gweru (Kudzanayi) and Mutare (Sakubva). The choice of the places was mainly based on the fact that they are the largest agricultural produce markets in Zimbabwe. Using a structured questionnaire, a total of 169 farmers were interviewed, who are mainly farmers supplying the main markets in Harare, Bulawayo, Mutare and Gweru.

In addition, three focused group discussions (FDGs) were conducted in Harare, two in Bulawayo and two in Mutare. Each focused group had about seven participants,
resulting in 14 participants each in Bulawayo and Mutare and 21 participants in Harare. In Mutare and Bulawayo, the FDGs selection was done in such a way that traders and farmers would be separated. In Harare, a third category, transporters, was included as these play a more pronounced role in Harare than the other two markets.

Based on the discussions, the following can be suggested as recommendations to remove barriers to market access by the farmers:

- Enhance the quality of the output at the farm level
- Mobilise smallholder farmers to take advantage of export opportunities.
- Transport costs need to be contained by ensuring that district and provincial markets are equally as lucrative as Harare.
- Ensure that the market place is conducive and attractive for smallholder farmer participation
- Enhance security to incentivise farming and increase returns from trading, which benefits the economy.
- Improve sanitation at the market place.
- Enhance access to market information

**Key Words:** Smallholder farmers, market access, retail market, farmers’ market, market barriers

**Date when the study was completed:** October 2015
Cost Driver Analysis of the Zimbabwean Economy

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ABSTRACT

ZEPARU undertook this study on request from the Ministry of Industry and Commerce (MIC). The purpose of the study was to analyse the “country’s pricing structure” in response to the current uncompetitive position of Zimbabwean goods and services compared to imports. The study tapped on the cost drivers identified from ZEPARU’s four Value Chain studies on Chemical Industries, Engineering and Metal Products, Cotton to Clothing, and Agro Value Chain. These cost drivers include labour, power, water, finance, transportation costs, duties and taxes, and higher domestic prices for imported inputs (the latter vary by industry) as major cost drivers. The objectives of the study were to:

- Develop a regional comparative analysis of those major cost factors affecting the competitiveness of Zimbabwe industries
- Evaluate Zimbabwe’s costs in light of those comparisons
- Illustrate with two case studies that will look at a given product production structure to disaggregate those cost elements and their impact on its competitiveness
- Highlight the areas in which policy reforms would be needed to increase the competitive position of Zimbabwean goods and services in both domestic and external markets

The study established that in the current context where the confidence of economic agents would preclude the re-introduction of a national currency, the economy needs to adjust to the realities of dollarization and the need for an “internal devaluation” that supposes a downward adjustment in the costs businesses face in their production processes.

With the exception of water and certain IT segments (and even then, some issues are discussed in the relevant sections) the other input factors examined have sizeable gaps in relation to regional competitors. The main factors of production, capital (finance) and labour will impact all the other cost factors in the proportion that each activity uses each factor, but the others examined here are critical as well for a competitive business and economic performance.

Amid the restrictions imposed by dollarization (specifically, the inability to regain competitiveness through a currency devaluation), the Zimbabwean economy cannot
afford the restrictions that are in place in its labour, foreign investment and international trade policies that are increasing the cost of doing business. While there are large investment needs in rail, power, information communication technology (ICT), and road infrastructure to close those cost gaps, a more open, liberalized and unrestricted economy, coupled with a more customer-centric government that improves the quality of its regulation can go a long way in the path to achieve the needed cost reductions to close the competitiveness gap. Indeed, as detailed throughout this report, a significant part of the high costs are policy-inflicted.

This internal devaluation process requires coordinated actions across different government ministries and agencies in Zimbabwe. And for reform processes to work, they need buy-in and mandates at high levels of government. This is recognized in the recommendation to establish a Better Business Regulation Commission, as detailed in numeral 5, below. However, in as far as they relate to cost structures and industry competitiveness, this becomes the central business for the MIC to flag the impacts of these costs to other government structures. In many countries, the role of advocating for a business-friendly enabling environment is also reinforced by investment promotion agencies that become the “guardians of the business environment”.

Within this context, specific actions and policy options that MIC could advocate for reducing costs to private enterprises are as follows:

- Reforms to the labour code and wage-setting practices
- Tariffs Reduction, Streamlining of Permits, and Trade Facilitation
- Update property valuations to reflect market conditions
- Revision of Environmental Standards and EMA regulations
- Establishment of a Better Business Regulation Commission, a permanent unit to review the flow of new business regulations, and introduction of regulatory quality elements (MIC, Office of the President and Cabinet)

**Key Words:** Cost drivers, competitiveness, labour, power, water, finance, transportation costs

**Date when the study was completed; October 2014**
Harnessing Resources from the Informal Sector for Economic Development

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ABSTRACT

In his 2014 National Budget statement, the Minister of Finance and Economic Development announced that the economy had undergone significant structural transformation in the last decade. The economy is now anchored on a vibrant informal sector. This new economic order, where the informal sector is now the dominant sector requires that strategies should be put in place to nurture the sector so that it can sustainably and significantly contribute to the growth of the broader economy. The structural change that has taken place calls for the banking sector to take a proactive approach of harnessing resources currently believed to be circulating outside the formal financial system.

In light of the above, the study was designed with the following objectives:

- To unpack the challenges currently faced by the informal sector in accessing the financial sector;
- To propose solutions on how banks can realize benefits from the informal sector and how the banking sector can nature the informal sector; and
- To proffer recommendations on how the banking sector can harness resources circulating outside the banking system.

The study was based on primary data, which was collected through a survey of informal sector players as well as interviews with representatives of the players. A combination of simple random and purposive sampling was used in selecting respondents in the informal sector for interviews. Firstly, one of the country’s leading institutions in tracing data for agro-based retailing at the traditional trading places throughout the country, eMkambo, was engaged to get access to the farmers as well as retailers who trade in vegetables and livestock at Mbare Musika, Harare as well as at different places in Bulawayo. The farmers and the traders were then selected at random, largely based on convenience, for interviews. Secondly, the Harare Chamber of SMEs as well as the Bulawayo Chamber of SMEs was also engaged to enable access to their members, who mostly operate in the informal sector. The members in both Bulawayo and Harare were then accessed through their Chambers. Thirdly, the Women’s Bureau was also engaged to enable access to their members in Bulawayo. These women were also contacted through the Bulawayo office and interviewed based on availability. Through this process, some of the farmers interviewed who were delivering products to Harare were also from Murehwa, Mutoko, Nyanga, Mhondoro and Domboshawa.
A total of 244 informal sector players were interviewed, for which about 69% were in Harare, 27% in Bulawayo and 4% were from other parts of the country.

The study established that although the informal sector players could have few resources in isolation, they could become a formidable source of resources when combined. Banks should thus engage the informal sector players and embrace the idea of fostering partnerships and clusters. Under this arrangement informal sector players, through the assistance of banks, pool their resources by bringing their capital and expertise together to make a meaningful investment. This also allows them to gain knowledge further and skills from their partners than when operating as individuals. If the small traders come together to work as a group, they should also be encouraged to register their associations to assist in easily identifying their location, assessing their challenges and also make banks aware of their existence.

**Key Words:** Informal sector, bank accounts, bank loans, credit worthiness, sales

**Date when the study was completed:** October 2014
ABSTRACT
Five years after the height of its financial crisis, the country’s economy once again faces substantial challenges. This is particularly true in the corporate and financial sectors, where loans to companies are going unpaid and companies are looking to formal and informal arrangements to address mounting financial distress. Among the companies trying to stay afloat, at least some are already too far-gone to be saved. Distinguishing between the hopeless corporate cases and the ones worth saving is crucial at a time when financial resources and the technical expertise necessary to turn companies around are growing excessively thin.

At least one of the ways of addressing these issues is through resort to laws and institutions that help corporate debtors and creditors to resolve their claims in a structured setting. In Zimbabwe, the Companies Act and the Insolvency Act, as implemented by the High Court, the Master’s Office, and the various appointed liquidators and judicial managers, make up what could be referred to as the country’s insolvency resolution regime.

In the face of these considerable and likely increasing economic challenges, there is a growing sense that the country’s insolvency resolution regime needs upgrading. The Competition and Tariff Commission (CTC), observing the deleterious effect of corporate financial distress on competition and employee welfare, invited the Zimbabwe Economic and Policy Analysis Research Unit (ZEPARU) to collaborate on a study. The goal was a research report that could serve as both a catalyst, and basis, for formulating and implementing an enhanced policy framework for addressing corporate insolvency.¹

The specific recommendations from the study included the following:

- The current economic challenges facing the country are leaving many companies heavily in debt with few avenues for new capital as a result.
- While the underlying legal and judicial framework appears to be reasonably sound, there is both a need and an opportunity to upgrade the country’s insolvency resolution regime.
- An effective insolvency resolution regime, combined with other business and investor friendly policies, can substantially accelerate and improve the

¹ Procedures for resolving personal insolvency are outside the scope of this research report.
effectiveness of efforts of a financially troubled company to resolve and adjust competing claims against it. Such a regime will add to creditor confidence and encourage lenders to offer finance on less onerous terms.

- There are several options to pursue in upgrading the insolvency resolution regime. It seems, however, that either (a) new regulations under existing law combined with a handful of legislative amendments (See Sections 7.2 and 7.3) or (b) adoption of a rescue regime similar to South Africa’s (See Section 7.4) offer the biggest potential for improvement in the shortest period of time.

- In terms of particular substantive reforms, the following should be considered high priority:
  - Establishing more consistent and transparent standards for regulating insolvency resolution professionals and enhancing mechanisms that sanction individuals from deviating from these standards.
  - Increasing transparency with respect to implementing the regime, both within particular cases and in the performance of the system in its entirety.
  - Encouraging the earlier use of schemes of arrangement or other rescue mechanisms that would adjust creditor and shareholder claims to a level that would allow troubled companies the room to resume or increase operations.
  - Giving insolvency resolution professionals or new owners of troubled companies more legal flexibility to streamline operations in order to return to profitability and to repay adjusted claims.
  - Simplifying both rescues and liquidations by consolidating and reducing the number of statutorily recognized classes of creditors.
  - Adjusting downward the current 75 percent approval rule to increase the possibility that reasonable schemes of arrangement or other rescue plans gain approval.

**Key words:** Insolvency, bankruptcy, clean balance sheet, Companies Act, judicial management, liquidation

**Date when the study was completed:** February 2014
ABSTRACT

Although the market is often regarded as the most efficient mechanism for distributing goods and services, there are cases where market failure exists, which would require the intervention of regulation. The regulator’s role would be to force the market to correct itself and become efficient; in situations where the market is operating efficiently, regulation would be an unnecessary burden to the companies. Regulation is needed where competition among suppliers is imperfect, where there is imperfect information and information asymmetry between suppliers and users and where there are negative externalities such as pollution of the atmosphere by the producers. Regulation can however be introduced in situation where it is not necessary. This paper assesses the regulatory burden of firms in three manufacturing sectors, namely timber, chemicals and pharmaceutical. The burden is assessed in terms of both the process required as well as the costs that the firms have to bear in complying with them.

The methodology employed included use of available secondary data and interviews with selected companies that managed to avail information from the chosen sectors. Interviews with all the key regulatory institutions and authorities who enforce the regulations and by-laws that firms in the sectors are supposed to comply with were conducted. In addition, a cross section of firms in the three sectors was selected for interviews. However, due to time and cost considerations, only firms in the two sectors in Bulawayo and Harare were selected. Structured questions were prepared and administered to solicit for information on regulatory fees, rationale, payment mechanisms, penalties and frequency with which these fees have to be complied with. Disaggregated statistics on cost build-up of the firms to assess the overall contribution of fees and other compliance costs were collected and a simple statistical analysis on the collected data was done to give an indication of the burden of complying with regulations to businesses.

The study established that the cost of regulation is a very significant driver in the overall costs of business for all the three sectors. In addition, there was some level on uncoordinated behaviour on the part of the regulators, given that there were some overlaps in regulated activities. Compliance with some of the requirements was also difficult for the firms, as they appeared to have not been properly contextualised to the Zimbabwe economy. Thus the reduction of the charges, harmonisation of regulatory operations and revision of some of the templates used by regulators were recommended.

Key Words Regulation, compliance costs, regulatory fees, regulatory penalties

Date when the study was completed: June 2014
ABSTRACT
The objective of the study is to examine strategies that should be implemented to foster financial inclusion in Zimbabwe. Exploring international experience on financial inclusion and the state of financial inclusion in Africa, the study reviews Zimbabwe’s current financial inclusion policies/strategies and their effectiveness and identifying obstacles cited for barriers to financial inclusion such as lack of enough money to justify having a formal account, administration charges of maintaining an account and distance from banks. The paper develops a comprehensive analysis on designing an appropriate financial inclusion framework which can benefit the poor and also suggests strategies essential for fostering financial inclusion in Zimbabwe.

Using desk research the study analysed available secondary data to make policy recommendations. The strategies suggested as essential for fostering financial inclusion in Zimbabwe include, among others:

- Transforming the People’s Own Savings Bank (POSB)
- Promoting the setting up of microfinance banks
- Promoting technological innovation
- Promoting infrastructure development
- Reviewing banking laws
- Promoting expansion of product portfolio
- Promoting increased cooperation among banks.

Finally, the paper suggests the need to address various barriers to financial inclusion which include high cost of financial services, lack of financial knowledge, contractual and informational infrastructure as necessary for financial inclusion.

Key Words Financial Inclusion, Microfinance, Credit, poverty and Zimbabwe

Date when the study was completed: January 2014
ABSTRACT

Although tourist arrivals in Zimbabwe have been growing since 2010, the growth has been at a sluggish rate compared to the 1980 to 1999 period. A number of factors contributing to the slow growth have been cited. However, very few studies focusing on the impact of the quality of service delivery have been undertaken. The purpose of this study, therefore, was to assess the influence of service delivery within the hospitality industry in the resort town of Victoria Falls. Specifically, the study focused on the gaps between tourist expectations before coming to Victoria Falls and their perceptions or experiences after the visits. The study was justified on the premise that hospitality is about customer care and helping tourists to feel welcome by providing them with the best experience possible. To assess the quality of service delivery, the study used the five dimensions of the SERVQUAL Model, namely, reliability, assurance, tangibility, empathy and responsiveness (RATER). The descriptive survey was adopted while the qualitative method was used to gather data from tourists, employees and management. The quantitative method was also used to collect typically numeric data and to assign a numerical weight to each of the five dimensions of the SERVQUAL model. The study revealed considerable gaps between tourist expectations and perceptions, with tourist perceptions coming far below their expectations in all the five dimensions of the SERVQUAL model. As a consequence, most visitors to Victoria Falls, except for business tourists, were day excursionists who opted to either fly back to their homes or spend the night across the Zambezi River in Livingstone, Zambia. Most managers attributed the low perceptions of service delivery to inexperienced staff. They stated that they had lost a number of well trained and experienced employees between the years 2000 and 2009. On the other hand, several employees blamed management for their failure to invest in training of the new and inexperienced recruits. The study concluded that the poor quality of service delivery was a contributing factor to the slow upturn of the tourism industry. Thus, the major recommendation of the study was the need for the hospitality industry in general and in Victoria Falls in particular, to re-brand itself by investing in continuous staff training and development.

Key Words: hospitality industry, tourist arrivals, service delivery, rebranding.
571. Community Vulnerability to Climate Change In the Lupane District of Matabeleland North, Zimbabwe

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ABSTRACT

Although climate change models predict harsher weather conditions along the Zambezi Basin, very few studies have been carried out at micro or district levels. The purpose of this study, therefore, was to assess the vulnerability of local farming communities in the Lupane District of Matabeleland North Province to climate change. The specific objectives of the study were to establish the changes in local temperatures and rainfall patterns; the frequency of mid-season droughts; the current average length of the cropping seasons; the impact of climate change on crop yields, food and livelihoods. The study was considered significant as an understanding of the vulnerability of these communities could influence the development and infusion of technologies that enhance and stabilize the community livelihoods. The study utilized existing secondary data on the District’s temperature and rainfall patterns; length of cropping seasons; and the status of crop yields and food security. Primary data on local agricultural performance and the food security situation at household levels were obtained from 125 randomly selected households using open-ended questionnaires. To validate data, focus group discussions were held with local opinion leaders such as traditional leaders, school headmasters, business people and leaders of farmer associations. The major findings of the study were that there was a general increase in temperatures as well as a decrease in average annual rainfall. In a district that largely depended on rain-fed agriculture, this had a devastating effect as it was often followed by reduced crop yields, leading to increased food insecurity and starvation within the District. The livestock numbers were also decreasing due to regular droughts. Thus, the study concluded that climate change in Lupane District was intensifying and that, as a consequence of regular droughts, the livelihoods of the farming communities in the District were adversely affected, leading to regular food insecurity and starvation. On this basis, the study recommended that both central and local governments, in partnership with NGOs and the private sector, should develop irrigation schemes to bring about robust farming systems that increase and stabilize agricultural productivity.

Key Words: climate change, vulnerability, community livelihoods, food security
ABSTRACT
The paper seeks to analyze African conflicts exploring these conflicts using Edward Azar’s Protracted Social Conflict theory. What Azar’s theory entail applies to most of Africa’s violent conflicts which emanate from the exercise of power. The paper assumes that the basic human needs are of paramount importance in sustainable peace. Azar asserts that these intra-state and inter-state conflicts are as a result of increasing concern about the conditions of the native environment. The paper explores the basic needs as cultural identity, security, recognition and acceptance, fair access to political institutions and economic participation in relation to the Rwandan, Uganda and Kenya. Investigating how these conflicts have started and their progression, escalation, the parties’ arguments, the countries’ political systems. If the governance system changed, what was its traditional preoccupation. An analysis of the African political system, the minority and the majority, the dominant cultures, national identity and language, to find out what could be the major cause of African conflicts and how they can be transformed in light with conflict transformation theory and Azar’s theory. The paper concludes by analysing peace building employed on African conflicts and whether these were sustainable or not and why.

Key Words conflict, peace, sustainable peace
ABSTRACT
The research seeks to define globalization and examine the cultural aspects, the philosophy governing the Zimbabwean culture *Ubuntu/Unhu* and identify the Zimbabwean family as an institution’s historical background in order to examine the effects of globalization to the social fabric. Through the use of field visits, interviews, group discussions and relevant literature from institutions and organizations dealing with matters affecting the family, in example, the courts, police, chiefs’ courts, churches, the research was carried out over a period of two years in the Great Harare Province of Zimbabwe where almost the population represents almost all provinces of Zimbabwe. The paper identified labour force migration, incurable diseases, economic challenges, urbanization, the formal legal system as factors which have exerted unbearable on the family forcing it to disintegrate. The effects of trade, the media, social media and cultural globalization were examined to evaluate the value the family still has in the society and the paper conclude that the family has lost its status as a socializing agent, integrity, monogamy, chastity, respect all replaced by the zeal for economic and political power. *Ubuntu/Unhu* has lost its relevance and is being considered as some kind of backwardness, the Western culture has overtaken the indigenous culture socially, economically and politically, the ‘we are’ aspect has been replaced by ‘I am’ individual rights supersedes the group rights. The paper recommends policies to be introduced to revive the traditional culture through education, the media, official languages, marriage laws and employment policies.

Key Words: globalization, family, *ubuntu/unhu*
574. The Effects of Globalization on African Weaker Economies

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ABSTRACT

The introduction of new technologies consolidation of world systems into a menology entails a process of advancement and interaction among the world economies through the facilitation of progressive technological changes in locomotion, communication, political and military power, knowledge and skills as well as cultural and value systems and practices interfacing- globalization. What effect this trend of fast advancement on technology has on the weaker African economies is what this paper seeks to investigate. The pace with which these trends move is definitely not bearable on the least developed countries in Africa. The issue of human rights has had a negative impact on African culture. Globalization entails cultural exchange which has exerted so much pressure on African leaders in trying to maintain their state sovereignty. Christianity has spread so fast and so has homosexuality both which has burdened the African culture. Workforce migration has had an effect on Africa and the paper seeks to investigate the major effects and the extent of these trends in development. The desk research sought to analyze the problems of globalization in relation to industrial sector of the African states, socio-economic and culturally through relevant literature, the media, television news and interviews with academics. The paper concludes by analysing how globalization threatens the discretion of the state, its security system, peace and development in the African continent.

Key Words: culture, state sovereignty, globalization, peace, security
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ABSTRACT
The vegetation condition of the study area in the elephant impacted Sengwa Wildlife Area of the semi-arid area of northwest Zimbabwe was randomly assessed in 50 x 20 m permanently marked plots of approximately 80 km². Density, diversity indices, structure and environmental factors were used to indicate vegetation condition after a long period of purposeful elephant population reduction. In the aftermath of culling history vegetation shows a recovery in number of saplings, stem height and canopy cover. Diversity of woody plants increased towards downstream. The results have a bearing on long term management of protected areas.
576. Predicting Human-Carnivore Conflicts Risk Areas in a Conflicting Land Use Zone. A Case Study of Matetsi Community Areas.

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ABSTRACT

Human-carnivore conflicts (HCC) are one of the major problems in wildlife conservation areas. Livelihoods of societies in human-carnivore conflict zones are affected as well as conservation efforts for these large home ranging species. In these interactions carnivores are considered a problem animal and are usually killed. In this study we used a Maximum Entropy (Maxent) to predict the spatial risk of human-carnivore conflicts in the Matetsi Safari Area and surrounding communities using the conflict presence data collected between 2013 and 2015. The aim was to understand if these attacks can be predicted and map high risk areas for potential conflicts and mitigation. The variables used were distance from park boundary (DPB), normalized difference vegetation index (NDVI), land use land cover type (LULC) and human population densities (HPD). Results showed that the DPB highly predicted HCC followed by LULC with, NDVI and HPD lastly. The results showed that at short distances from the park boundary the probability of attack was high (0.6). As distance increased, the probability of attack lowered. Beyond 11 km, the risk was nearly zero. Areas dominated by woodlands had higher chances of HCC than those in grasslands. NDVI highly predicted at approximately 0.1 and the chance declined as NDVI increased. The least predictor, HPD of above 0.07 people/km2 warranted a high risk of attack and remained constant even when densities increased. The AUC Test Data was 0.908. The risk maps show conflict hot spots which will help in issues like policy formulation, future settling of communities, focusing mitigation efforts/resources and improving conservation efforts for carnivore conservation.

Key Words: Livelihoods, hot spots, Maxent, mitigation, home range
Spatio-Temporal Variation of Fire Incidences in Gonarezhou National Park and Adjacent Communities

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ABSTRACT

Fire is regarded as one of the modifiers of the savanna ecosystem. Controlled burning is essential in ecosystems as it maintains their integrity, however uncontrolled fires can be damaging and the need to reduce them is essential. In this study we investigated the spatial and temporal distribution of illegal fires during the fire season in Gonarezhou National Park and adjacent communities between 2011 and 2015 using satellite derived (MODIS) fire occurrences. A Simple linear regression was used to analyze trends in fires incidences, the Diggle’s G function with Monte Carlo simulations and the quadratic kernel density estimation was used to understand the spatial distribution of fire occurrences for the study areas. The Pearson correlation analysis was used to determine the relationship between poaching and fire occurrences. The findings showed that there were no significant increases in number of fires between 2011 and 2015 (P > 0.05). There was significant clustering of fire incidences at all distances both inside and outside the park between 2011 and 2015. A significant positive correlation between poaching statistics and fire occurrences (R=0.98, P <0.05) indicates poaching as a major threat to fire management in Gonarezhou National Park. The study suggests the importance of increased patrol efforts during the fire season and prioritization of fire monitoring along the railway line which pass through the Park.

Key Words: MODIS, Hot spot, Poaching, Diggle’s G Function, Monte Carlo


On Going Research

578. The Sanitation Hygiene Infant Nutrition Efficacy (SHINE) Trial: Rationale, Design and Methods

The SHINE Trial Team

ABSTRACT
Child stunting and anemia are intractable public health problems in developing countries that have profound short- and long-term consequences. The Sanitation Hygiene Infant Nutrition Efficacy (SHINE) trial is motivated by the premise that environmental enteric dysfunction (EED) is a major underlying cause of both stunting and anemia, that chronic inflammation is the central characteristic of EED mediating these adverse effects, and that EED is primarily caused by high fecal ingestion due to living in conditions of poor water, sanitation and hygiene (WASH). SHINE is a proof-of-concept, 2x2 factorial, cluster-randomized, community-based trial in two rural districts of Zimbabwe that will test the independent and combined effects of protecting babies from fecal ingestion (Factor 1, operationalized through a WASH intervention) and optimizing nutritional adequacy of infant diet [Factor 2, operationalized through an infant and young child feeding (IYCF) intervention] on length and hemoglobin at 18 months of age. Within SHINE we will measure two causal pathways. The program impact pathway comprises the series of processes and behaviors linking implementation of the interventions with the two child health outcomes; it will be modeled using measures of fidelity of intervention delivery and household uptake of promoted behaviors and practices. We will also measure a range of household and individual characteristics, social interactions, and maternal capabilities for childcare, which we hypothesize will explain heterogeneity along these pathways. The biomedical pathway comprises the infant biologic responses to the WASH and IYCF interventions that ultimately result in attained stature and hemoglobin concentration at 18 months of age; it will be elucidated by measuring biomarkers of intestinal structure and function (inflammation, regeneration, absorption and permeability); microbial translocation; systemic inflammation; and hormonal determinants of growth and anemia among a subgroup of infants enrolled in an EED sub study. This paper describes the rationale, design and methods underlying the SHINE trial, which is registered at http://Clinicaltrials.gov as protocol NCT01824940.

Key Words: sanitation, hygiene, stunting, anemia, environmental enteric dysfunction, Zimbabwe

Date when the study is expected to be completed: 2018
Design of an Intervention to Minimize Ingestion of Fecal Microbes by Young Children in Rural Zimbabwe

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ABSTRACT
We sought to develop a water, sanitation & hygiene (WASH) intervention to minimize fecal-oral transmission among children 0-18 months in the SHINE trial. We undertook four phases of formative research, comprising in-depth interviews, focus group discussions, behavior trials, and a combination of observations and microbiological sampling methods. The resulting WASH intervention comprises material inputs and behavior change communication to promote stool disposal, washing with soap, water treatment, protected exploratory play and hygienic infant feeding. Nurture and disgust were found to be key motivators, and are used as emotional triggers. The concept of a safe play space for young children was particularly novel and families were eager to implement this after learning about the risks of unprotected exploratory play. An iterative process of formative research was essential to create a sequenced and integrated longitudinal intervention for a SHINE household as it expects (during pregnancy) and then cares for a new child.

Key words: Water, sanitation and hygiene; intervention design research; formative research; stunting, environmental enteric dysfunction

Date when the study is expected to be completed: 2018

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ABSTRACT

The SHINE Trial is designed to measure the independent and combined effects of improved water, sanitation, and hygiene and improved infant feeding on child stunting and anemia in Zimbabwe. We developed and pilot-tested the infant feeding intervention delivered by 9 Village Health Workers to 19 mothers of infants 7-12 months old. Between September 2010 and January, 2011, maternal knowledge was assessed using mixed methods and infant nutrient intakes were assessed by 24-h recall. We observed positive shifts in mothers’ knowledge. At baseline, 63% of infants met their energy requirement and most did not receive enough folate, zinc, or calcium; none met their iron requirement. Post-intervention, all infants received sufficient fat and Vitamin A, and most consumed enough daily energy (79%), protein (95%), calcium (89%), zinc (89%), folate and iron (both 68%). The SHINE Trial infant feeding intervention led to significant short-term improvements in maternal learning and infant nutrient intakes.

Key words: Infant and young child feeding, intervention design research, dietary assessment, complementary feeding, lipid-based nutrient supplement.

Date when the study is expected to be completed: 2018
Using Geographic Information Systems and Spatial Analysis Methods to Assess Household Water Access and Sanitation Coverage in the SHINE Trial

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ABSTRACT

Access to water and sanitation are important determinants of behavioral responses to hygiene and sanitation interventions. We estimated cluster-specific water access and sanitation coverage to inform a constrained randomization technique in the SHINE trial. Technicians and engineers inspected all public access water sources to ascertain seasonality, function, and geo-spatial coordinates. Households and water sources were mapped using open-source geospatial software. The distance from each household to the nearest perennial, functional, protected water source was calculated; and for each cluster, the median distance, and the proportion of households <500m and >1500m. Cluster-specific sanitation coverage was ascertained using a random sample of 13 households per cluster. These parameters were included as covariates in randomization to optimize balance in water and sanitation access across treatment arms at the start of the trial. The observed high variability between clusters in both parameters suggests constraining on these factors was needed to reduce risk of bias.

Key Words Spatial analysis, Water access, water coverage, geographic information systems, geo-referenced dataset

Date when the study is expected to be completed: 2018
Assessment of Environmental Enteric Dysfunction in the SHINE Trial: Methods and Challenges

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Members are listed in: The SHINE Trial Team. The Sanitation Hygiene Infant Nutrition Efficacy (SHINE) trial: rationale, design and methods. Clinical Infectious Diseases 2015; (suppl*):S***-**.

ABSTRACT

Environmental enteric dysfunction (EED) is a virtually ubiquitous, but poorly defined, small intestinal disorder among people living in conditions of poverty, which begins early in infancy and persists. EED is characterized by altered gut structure and function, leading to reduced absorptive surface area and impaired intestinal barrier function. It is hypothesized that recurrent exposure to fecal pathogens and changes in the composition of the intestinal microbiota initiate this process, which leads to a self-perpetuating cycle of pathology. We view EED as a primary gut disorder that drives chronic systemic inflammation, leading to growth hormone resistance and impaired linear growth. There is currently no accepted case definition or gold standard biomarker of EED, making field studies challenging. The Sanitation Hygiene Infant Nutrition Efficacy (SHINE) trial in Zimbabwe is evaluating the independent and combined effects of a package of infant feeding and/or water, sanitation and hygiene interventions on stunting and anemia. SHINE therefore provides an opportunity to longitudinally evaluate EED in a well-characterized cohort of infants, using a panel of biomarkers along the hypothesized causal pathway. Our aims are to describe the evolution of EED during infancy, ascertain its contribution to stunting and investigate the impact of the randomized interventions on the EED pathway. In this paper, we describe current concepts of EED, challenges in defining the condition and our approach to evaluating EED in the SHINE trial.

Key words: Infants, stunting, environmental enteric dysfunction, inflammation, IGF-1

Date when the study is expected to be completed: 2018
The Potential Role Of Mycotoxins As A Contributor To Stunting In The SHINE Trial

Authors list

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ABSTRACT

Children in developing countries experience multiple exposures that are harmful to their growth and development. An emerging concern is frequent exposure to mycotoxins which contaminate a wide range of staple foods including maize and groundnuts. Three mycotoxins are suspected to contribute to poor child health and development: aflatoxin (AF), fumonisins (FUM) and deoxynivalenol (DON). We summarize the evidence that mycotoxin exposure is associated with stunting, and propose that the causal pathway may be through environmental enteric dysfunction (EED) and disturbance of the IGF-1 axis. The objectives of this sub study are to assess the relationship between agricultural and harvest practices and mycotoxin exposure; evaluate associations between mycotoxin exposure and child stunting; and investigate EED as a potential pathway linking mycotoxin exposure to child stunting to inform potential areas for intervention.

Key words: Zimbabwe, infant, stunting, aflatoxin, fumonisins, deoxynivalenol, mycotoxin

Date when the study is expected to be completed: 2018
Assessing the Intestinal Microbiota in the SHINE Trial

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ABSTRACT

Advances in DNA sequencing technology now allow us to explore the dynamics and functions of the microbes that inhabit the human body, the microbiota. Recent studies involving experimental animal models suggest a role of the gut microbiota in growth. However, the specific changes in the human gut microbiota that contribute to growth remain unclear, and studies investigating the gut microbiota as a determinant of environmental enteric dysfunction (EED) and child stunting are lacking. In this paper, we review the evidence for a link between the developing infant gut microbiota, infant feeding, EED and stunting, and discuss the potential causal pathways relating these variables. We outline the analytic approaches we will use to investigate these relationships, by capitalizing on the longitudinal design and randomized interventions of the SHINE trial in Zimbabwe.

Key words: microbiome, microbiota, stunting, linear growth, infant, environmental enteric dysfunction

Date when the study is expected to be completed: 2018
Assessing Maternal Capabilities in the SHINE Trial: Highlighting a Hidden Link in the Causal Pathway to Child Health

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ABSTRACT

A potential bottleneck for increasing the adoption of child health interventions has been limited attention to designing actions that are built on the essential role that caregivers play in determining their effectiveness. In the Sanitation Hygiene Infant Nutrition Efficacy (SHINE) Trial, we utilize the concept of maternal capabilities to examine participants’ skills and attributes that affect their ability to provide appropriate care for their young child, fully engage with trial interventions and influence the response to these interventions at the household level. We hypothesize that the impact of SHINE interventions on child stunting and anemia will be modified by these maternal capabilities. Drawing upon multiple theories, we identify and define critical maternal capabilities domains, and describe how they are measured in the trial. Description of maternal capabilities and their role as potential modifiers on impact will increase understanding of the impact of SHINE interventions, and the generalizability of our findings.

Key words: caregiver capabilities, child caregiving, intervention design, impact evaluation.

Date when the study is expected to be completed: 2018
Theory-Driven Process Evaluation of the SHINE Trial Using a Program Impact Pathway (PIP) Approach

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ABSTRACT

Two reasons for the lack of success of programs or interventions are poor alignment of interventions with the causes of the problem targeted by the intervention, leading to poor efficacy (theory failure), and failure to implement interventions as designed (program failure). These considerations are important for public health programs and randomized trials. In the Sanitation/Hygiene and Infant Nutrition Efficacy (SHINE) Trial, we utilize the program impact pathway (PIP) approach to track intervention implementation and behaviour uptake. In this paper we present the SHINE PIP, present definitions and measurement methods of key mediating domains, and discuss the implications of this approach for randomized trials. Operationally, the PIP can be used for program monitoring and strengthening, facilitating on-going course correction at various stages of implementation. Analytically, the PIP approach may facilitate a richer understanding of the mediating and modifying determinants of intervention impact than would be possible from an intention-to-treat analysis alone.

Key Words: Process evaluation, program impact pathway, intention to treat, per protocol

Date when the study is expected to be completed: 2018
587. Preventing Environmental Enteric Dysfunction through Improved Water, Sanitation and Hygiene: An Opportunity for Stunting Reduction in Developing Countries

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ABSTRACT

In 2011, one in every four (26%) children under 5 years of age worldwide was stunted. The realization that most stunting cannot be explained by poor diet or by diarrhoea, nor completely reversed by optimized diet and reduced diarrhoea has led to the hypothesis that a primary underlying cause of stunting is subclinical gut disease. Essentially, ingested microbes set in motion two overlapping and interacting pathways that result in linear growth impairment. Firstly, partial villous atrophy results in a reduced absorptive surface area and loss of digestive enzymes. This in turn results in maldigestion and malabsorption of much needed nutrients. Secondly, microbes and their products make the gut leaky, allowing luminal contents to translocate into systemic circulation. This creates a condition of chronic immune activation, which (i) diverts nutrient resources towards the metabolically expensive business of infection fighting rather than growth; (ii) suppresses the growth hormone-IGF axis and inhibits bone growth, leading to growth impairment; and (iii) causes further damage to the intestinal mucosa thereby exacerbating the problem.

As such, the unhygienic environments in which infants and young children live and grow must contribute to, if not be the overriding cause of, this environmental enteric dysfunction. We suggest that a package of baby-WASH interventions (sanitation and water improvement, hand washing with soap, ensuring a clean play and infant feeding environment and food hygiene) that interrupt specific pathways through which feco-oral transmission occurs in the first two years of a child’s life may be central to global stunting reduction efforts.

Key Words: stunting, nutrition, disease, infant and child nutrition, early growth, sanitation.

Date when the study is expected to be completed: 2018
Completed Research

588. Water, Sanitation, and Hygiene (WASH), Environmental Enteropathy, Nutrition, and Early Child Development: Making the Links

Francis M. Ngure¹, Brianna M. Reid², Jean H. Humphrey³,⁴, Mduduzi N. Mbuya³, Gretel Pelto¹ and Rebecca J. Stoltzfus¹,*

ABSTRACT

There is scarce research and programmatic evidence on the effect of poor water, sanitation, and hygiene (WASH) conditions of the physical environment on early child cognitive, sensorimotor, and socioemotional development. Furthermore, many common WASH interventions are not specifically designed to protect babies in the first 3 years of life, when gut health and linear growth are established. We review evidence linking WASH, anemia, and child growth, and highlight pathways through which WASH may affect early child development, primarily through inflammation, stunting, and anemia. Environmental enteropathy, a prevalent subclinical condition of the gut, may be a key mediating pathway linking poor hygiene to developmental deficits. Current early child development research and programs lack evidence-based interventions to provide a clean play and infant feeding environment in addition to established priorities of nutrition, stimulation, and child protection. Solutions to this problem will require appropriate behavior change and technologies that are adapted to the social and physical context and conducive to infant play and socialization. We propose the concept of baby WASH as an additional component of early childhood development programs.

Key Words: Water; sanitation; hygiene; child development; nutrition; environmental enteropathy; stunting; anemia

Date when study is expected to be completed: Completed
Traditional Oral Remedies and Perceived Breast Milk Insufficiency Are Major Barriers to Exclusive Breastfeeding in Rural Zimbabwe

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ABSTRACT

Only 5.8% of Zimbabwean infants are exclusively breastfed for the first 6 months of life despite substantial investment in exclusive breastfeeding (EBF) promotion throughout the country. We conducted a survey of 295 mothers of infants <6 months of age who were recruited from rural immunization clinics and outreach sites in the Midlands Province of Zimbabwe. We explored infant feeding knowledge, beliefs and attitudes, and details regarding facilitators for EBF mothers and first foods fed by non-EBF mothers to identify and understand barriers to EBF. Among mothers of infants <1 mo, 1 to <2 mo, and 2–6 mo of age, 54%, 30%, and 12%, respectively, were practicing EBF. In adjusted multivariate analyses, EBF practice was positively associated with belief in the sufficiency of EBF (P = 0.05), belief in the avoidance of cooking oil feeding (a common traditional practice) in the first 6 mo (P = 0.001), and perceived pressure from others regarding infant feeding and traditional medicine use (P = 0.03). Psychosocial support and viewing breast milk as sufficient were reported as primary facilitators of EBF practice. Maternal responses to open-ended questions identified protection, nutrition, and crying as the main reasons for EBF interruption. During the first 2 mo of life, “protection feedings” using traditional oral remedies (such as cooking oil and water) to prevent or treat perceived illness, specifically colic and sunken/depressed fontanel, made up 78.5% of the non-breast milk feeds. From the second month of life, “nutrition feedings,” mainly of water and porridge, were given when mothers believed their breast milk was insufficient in quantity or quality to meet the hunger or thirst needs of their infants. Our findings underscore the importance of exploring cultural beliefs and practices as they pertain to infant feeding and care and present insights for designing and targeting EBF promotion interventions.

Key Words: N/A

Date when study is expected to complete: Completed

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Stunting Is Characterized By Chronic Inflammation in Zimbabwean Infants (620.4)

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ABSTRACT

Background Stunting affects one-third of children in developing countries, but the causes remain unclear. The objective of this study was to investigate whether low-grade inflammation suppresses the growth hormone-IGF axis and mediates stunting. We conducted a case-control study of 202 HIV-unexposed Zimbabwean infants who were stunted (height-for-age Z-score (HAZ) < -2; cases) or non-stunted (HAZ > -0.5; controls) at 18mo. We measured biomarkers of intestinal damage (I-FABP), inflammation (CRP, AGP, IL-6) and growth hormone-IGF axis (IGF-1, IGFBP3) in infant plasma at 6w and 3, 6, 12 and 18mo, and in paired maternal-infant plasma at birth. Adjusted mean differences between biomarkers were estimated using regression models. Multivariate odds ratios of stunting were estimated by logistic regression. Results At birth, cases were shorter than controls and their mothers had lower levels of IGF-1 (adjusted mean difference (95%CI) -21.4 (-39.8, -3.1) ng/mL). From 6w-12mo of age, levels of CRP and AGP were consistently higher and IGF-1 and IGFBP3 lower in cases versus controls; IGF-1 correlated inversely with inflammatory markers at all time-points. I-FABP increased between 3-12mo, indicating extensive intestinal damage, which was similar in cases and controls. In multivariate analysis, higher levels of CRP (aOR 3.06 (95%CI 1.34, 6.99); P=0.008) and AGP (aOR 7.87 (95%CI 0.74, 83.74); P=0.087) during infancy were associated with stunting. Conclusions Stunting began in utero and was associated with low maternal IGF-1 at birth. Inflammatory markers were higher in cases than controls from 6w of age and were associated with lower levels of IGF-1 throughout infancy. Higher levels of CRP and AGP during infancy were associated with stunting. These findings suggest that an extensive enteropathy occurs during infancy and that low-grade chronic inflammation may impair infant growth.

Date when study is expected to be completed: Completed
Acute Illness Is Associated With Suppression Of The Growth Hormone Axis In Zimbabwean Infants

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ABSTRACT

Frequent infections contribute to childhood stunting in developing countries but the causal pathways are uncertain. We tested the hypothesis that intercurrent illnesses suppress the growth hormone axis through reductions in insulin-like growth factor 1 (IGF-1). In a birth cohort of 202 HIV-unexposed Zimbabwean infants, we analysed data on 7-day illness recall and measured plasma interleukin-6, C-reactive protein, alpha-1-acid glycoprotein, and IGF-1 by enzyme-linked immunosorbent assay, at age 6 weeks, and then 3, 6, 12, and 18 months. Children with recent acute illness had lower IGF-1 concentrations than healthy children and IGF-1 correlated inversely (P < 0.05) with inflammatory biomarkers at most time points between 3 and 18 months. Using path analysis, we showed that cough and fever had a predominantly indirect effect on suppressing IGF-1, through the acute-phase response, whereas diarrhea had a predominantly direct effect on IGF-1. Acute illness may therefore impact the growth hormone axis through both direct and indirect pathways.

Date when study is expected to be completed: Completed
Congenital and Postnatal CMV and EBV Acquisition in HIV-Infected Zimbabwean Infants

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ABSTRACT

HIV-infected infants in sub-Saharan Africa have rapid disease progression. We hypothesized that co-infection with cytomegalovirus (CMV) or Epstein Barr virus (EBV) increases mortality in HIV-infected infants.

257 antiretroviral therapy-naïve HIV-infected Zimbabwean infants were tested for CMV and EBV at 6 weeks of age by real-time PCR; if positive, birth samples were retrieved where available to distinguish congenital and postnatal infection. The impact of co-infection on mortality through 6 months was estimated using Kaplan-Meier and Cox proportional hazards methods.

At 6 weeks, 203/257 (79%) HIV-infected infants were CMV-positive; 27 (11%) had congenital CMV, 108 (42%) postnatal CMV and 68 (26%) indeterminate timing of infection. By 6 months, 37/108 (34%) infants with postnatal CMV versus 16/54 (30%) CMV-negative infants died (adjusted hazard ratio (aHR) 1.1 [95%CI 0.6, 2.2]). At 6 weeks, 33/257 (13%) HIV-infected infants had EBV co-infection; 6 (2%) had congenital EBV, 18 (7%) postnatal EBV and 9 (4%) indeterminate timing of infection. By 6 months, 5/18 (28%) infants with postnatal EBV versus 72/224 (32%) EBV-negative infants died (aHR 0.8 [95%CI 0.3, 2.3]).

The vast majority of HIV-infants had acquired CMV by 6 weeks, and EBV co-infection occurred earlier than expected, with one in eight HIV-infected infants positive for EBV by 6 weeks. There was a high prevalence of congenital CMV infection and we identified 6 infants with congenital EBV infection, which has not previously been reported in Africa or in the context of HIV infection. Neither CMV nor EBV co-infection was associated with increased mortality.

Key Words: N/A

Date when study is expected to be completed: Completed
A Village Health Worker-Led Intervention to Promote and Support Exclusive Breastfeeding in Rural Zimbabwe Is Feasible, Acceptable and Effective (1015.8)

Cynthia Matare\textsuperscript{3,1}, Mdudzu Mbuya\textsuperscript{3,1}, Rebecca Stoltzfus\textsuperscript{1}, Katherine Dickin\textsuperscript{1} and Jean Humphrey\textsuperscript{3,2}

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**ABSTRACT**

Exclusive breastfeeding (EBF) is a pillar of child survival but in Zimbabwe, less than 6\% of infants are exclusively breastfed for 6 mo. Peer counselling has been shown to improve rates of EBF. We pilot-tested a Village Health Worker (VHW)-based EBF education intervention and assessed acceptability, within-household reach, motivators triggered, learning outcomes, and EBF intentions and behavior. The intervention delivered key messages at four times: late gestation, and <1 wk, 1 mo, and 3 mo post-partum. Nurses trained 20 VHWs on the EBF intervention over 4.5 days. The modules were delivered to 43 women; 13, 5, 11 and 14 at the respective time points, above. Researchers conducted a knowledge survey before the VHW visit and semi-structured in-depth interviews with the mothers 1 wk after the visit. The interviews were translated into English, transcribed and analysed using thematic analysis. The intervention was acceptable and directly or indirectly reached other influential household members who shape infant feeding practices. The intervention improved EBF knowledge and led to changes in infant feeding behaviours and intentions, motivated mostly by desire for a healthy baby. Some mislearning around maternal diet determining breast milk production also occurred. We conclude that targeted messages within home-based education modules delivered by VHWs to promote EBF are promising and should be tested at scale.

**Date when study is expected to be completed:** Completed
Plasma Concentrations of Hepcidin in Anemic Zimbabwean Infants

Tatenda G. Mupfudze, Rebecca J. Stoltzfus, Sandra Rukobo, Lawrence H. Moulton, Jean H. Humphrey, Andrew J. Prendergast, SHINE Trial Team

ABSTRACT

Objective

Anemia in infancy is a global public health problem. We evaluated the relative contributions of iron deficiency and inflammation to infant anemia.

Methods

We measured plasma hepcidin, ferritin, soluble transferrin receptor (sTfR), alpha-1-acid glycoprotein and C-reactive protein (CRP) by ELISA on archived plasma from 289 HIV-unexposed anemic or non-anemic Zimbabwean infants at ages 3mo, 6mo and 12mo. Among anemic infants, we determined the proportion with iron-deficiency anemia (IDA) and anemia of inflammation (AI). We undertook regression analyses of plasma hepcidin and anemia status, adjusting for sex, age and birth weight.

Results

Anemic infants at 3mo were more stunted and had higher CRP (median 0.45 vs 0.21mg/L; \( P = 0.037 \)) and hepcidin (median 14.7 vs 9.7ng/mL; \( P = 0.022 \)) than non-anemic infants, but similar levels of ferritin and sTfR; 11% infants had IDA and 15% had AI. Anemic infants at 6mo had higher hepcidin (median 7.9 vs 4.5ng/mL; \( P = 0.016 \)) and CRP (median 2.33 vs 0.32mg/L; \( P<0.001 \)), but lower ferritin (median 13.2 vs 25.1μg/L; \( P<0.001 \)) than non-anemic infants; 56% infants had IDA and 12% had AI. Anemic infants at 12mo had lower ferritin (median 3.2 vs 22.2μg/L; \( P<0.001 \)) and hepcidin (median 0.9 vs 1.9ng/mL; \( P = 0.019 \)), but similar CRP levels; 48% infants had IDA and 8% had AI. Comparing anemic with non-anemic infants, plasma hepcidin was 568% higher, 405% higher and 64% lower at 3mo, 6mo and 12mo, respectively, after adjusting for sex and birth weight (all \( p<0.01 \)). Plasma hepcidin declined significantly with age among anemic but not non-anemic infants. Girls had 61% higher hepcidin than boys, after adjusting for age, anemia and birth weight (\( p<0.001 \)).

Conclusion

Anemia is driven partly by inflammation early in infancy, and by iron deficiency later in infancy, with plasma hepcidin concentrations reflecting the relative contribution of each. However, there is need to better characterize the drivers of hepcidin during infancy in developing countries.

Date when study is expected to be completed: Completed
**ABSTRACT**

The main aim of the rural school computerisation programme was to enhance the teaching and learning processes in rural schools. By bringing technology to rural areas it was hoped that the majority of the students in rural schools will be at par with students in urban centres, mission and private schools. This study examined the extent of Information Communication and Technology (ICT) usage in the ten schools that received computers under the Presidential computerisation programme in Manicaland province. Through observation and in-depth interview of two teachers at each school from the ICT department, the findings suggested that there are a lot of factors that hinder the effective use of ICTs in these schools. These factors range from absence of proper infrastructure, erratic electricity supply as well as limited ICT knowledge among teachers. The study recommends that the involved parties should ensure provision of proper infrastructure. Teachers at the schools are also encouraged to take up courses in ICT so as to ensure they make full use of the facility in the teaching and learning programme.

**Key Words:** rural computerisation programme, information, communication and technology and Manicaland.

**Date when the study was completed**
ABSTRACT
The post-millennium collapse of the Zimbabwean economy, characterised by de-industrialisation and job losses, has been tied to the proliferation of the informal economy. This is now the mainstay for many Zimbabweans, despite that it is characterised by precarious livelihood, as less work is based on wage income. Population growth and migration has further accelerated the growth of the informal economy in Zimbabwe, as has the conspicuous growth of the poverty gap. The emergence of a new socio-economic ‘class’ profile has raised questions on the socio-economic and political order. However, while it is largely about survival, the informal sector is now central in framing the national and local political discourse and trajectory – a space that used to be the domain of formal economy trade unions. Drawing on case studies from Bulawayo, Harare and Mutare this paper identifies the nature and drivers of income inequality in the informal economy and how the latter has changed following the demise of what is known as the formal economy. It is based on a triangulation of in-depth interviews, participant observations and archival research. Drawing from this evidence we argue that the Zimbabwean informal economy, which now underpins the production, distribution and consumption processes following the collapse of the formal economy, is paradoxical. It is not just characterised by desperation, but it has/is – also (re)configuring Zimbabwe’s class structure; producing a new socio-economic and political economy characterised by a hierarchy with its own elite and poor.

Key words: Informal economy, income inequality, precarious, land reform, class

Date when the study was completed: October 2015
597. Levels of ICTs Integration into the Teaching and Learning of Management of Business (MOB): A Case of High Schools in Mutare Urban, Zimbabwe

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ABSTRACT
Zimbabwean education system is among the best in the continent and this achievement ought to be strengthened by the use of information and communications technologies (ICT) in education. As such the study focused on ascertaining levels of ICT appreciation and utilisation by management of business (MOB) teachers in high schools in Mutare urban. The study adopted a qualitative research approach that is in line with the phenomenological perspective as it sought to acquire knowledge through understanding the direct experience of others by engaging with participants through semi-structured interviews and classroom observations. The participants of this study were 15 MOB teachers purposively sampled based on qualities like subject taught. ICT, when appropriately used, can serve as a vehicle and a platform for meaningful educational reform geared towards a shift from didactic “instructionism” to constructivism. Our literature review and empirical evidence revealed that the majority of the teachers are not ready to integrate ICT in the teaching of MOB due to a number of obstacles that include unavailability of sufficient infrastructure and computer equipment. The research recommends a multi-sectoral approach to ensure that the education sector benefits from the use of ICT technology.

Key Words: Computer technology, I.C.T, management of business, Mutare urban

Date when the study was completed: June 2015
ABSTRACT
This study examined the level of Occupational Health and Safety (OHS) awareness and enforcement in mobile sawmills in Mutare, Zimbabwe. OHS regulations seek to reduce workplace accidents and enhance the firm’s performance and productivity. Knowledge of safety regulation enables employees to make informed judgements leading to reduction of activities that endanger their lives and those of their workmates. Using a qualitative research approach, 45 workers in the mobile sawmills were interviewed. The study recommends the enforcement of OHS standards that are non-existent in the periphery.

Key words: Occupational health and safety, mobile sawmills accidents, enforcement and OHS regulations.

Date when the study was completed: February 2015
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