Kirinyaga University

3rd Annual International Conference, 2019

BOOK OF ABSTRACTS

THEME

ENHANCING SUSTAINABLE ECONOMIC DEVELOPMENT AND KNOWLEDGE TRANSFER THROUGH RESEARCH

CONFERENCE DATES

SEPTEMBER 11 - 13, 2019

VENUE

KIRINYAGA UNIVERSITY, KENYA

Email: conference2019@kyu.ac.ke

KIRINYAGA UNIVERSITY

3RD ANNUAL INTERNATIONAL CONFERENCE, 2019

Book of Abstracts

Editors

Prof. Charles, O. A. Omwandho, PhD

Dr. Jotham M. Wasike, PhD

KIRINYAGA UNIVERSITY

3RD ANNUAL INTERNATIONAL CONFERENCE

THEME

ENHANCING SUSTAINABLE ECONOMIC DEVELOPMENT AND KNOWLEDGE TRANSFER THROUGH RESEARCH

SUB – THEMES

1) Health, Environment and Agriculture for Societal Empowerment.
2) Transforming Economies Through Science, Technology and Engineering.
3) Textile Technology for Sustainable Development.
4) Innovation in Entrepreneurship and Business Management for Sustainable Development.

Email: conference2019@KyU.ac.ke

Chartered Public University **KyU is ISO 9001:2015 certified**

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SUB-THEME: TRANSFORMING ECONOMIES THROUGH ENGINEERING, SCIENCE AND TECHNOLOGY

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Preliminaries

- Arrival and registration
- Familiarization and visit to conference venue
- Distribution of name tags and conference material
- Welcoming guests on campus
- Corrections on the program
- Make any announcements and changes
- PowerPoint presentations given to ICT staff for presentation

Coordinator: Dr. Jotham M. Wasike

8:00am - 9.00 am	Registration
9:00am - 9:10am	Welcoming Remarks Deputy Vice Chancellor (ASA). **Prof. Charles O. Omwandho, PhD**
9:10am – 10:00am	Opening Remarks /Presentation **Vice Chancellor, Prof. Mary Ndungu, PhD.**
10:00am-10:35am	Presentation **Prof Lutz Konrad, JLU, Gresse, Germany**
10: 35 am – 11: 00pm	Group Photo/Health Break
11.00am - 1.00pm	Parallel Sessions
1.00pm - 2.00pm	Lunch/Health Break
2.00pm - 4.00pm	Parallel Sessions
4.00pm - 4.30pm	Announcements/ Plenary/ Closing
4.30pm	Tea/ Guests Leave at their Own Pleasure.

MID MORNING PARALLEL SESSIONS

11.00AM – 1.00PM

SUB-THEME	HEALTH
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Chair	**Prof. Laura Wangai**
Rapporteur	**Mr. Ken Kamau**

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2) Mecha, E[1], Cong Sui[2], Omwandho, C. O. A[3], Hans-R. T[4], Konrad, L[5]. **([1,2,4,5]Justus-Liebig University, [1]UoN, [3]KyU). Cross Talk between Bone Morphogenetic Proteins (BMPs) and TGF-βs/ Receptors in Human Endometrial and Endometriosis Cells.**

3) Webale, M. K[1], Budambula, V[2], Were, T[3]. **([1] KyU, [2] MMUST, [3]TUM). HBV Seroprofile and Genotype among Injection Drug Users in Coastal Kenya.**

4) Kithaka, S. C., Njagi, E.C.& Magana, A.**(CU). Assessment of Coliforms Bacteria Contaminant in Nkenye Stream in Meru South, Kenya.**

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2) Kariuki, J.M[1], Bates, M[2], Magana, A[1]. **([1]Chuka University, [2]University of Northampton, United Kingdom). Soil Concentration of Selected Heavy Metals in Chuka, Nakuru and Thika Municipal Dumpsites.**

3) Ngetich, P. K. **(University of Eldoret). Mathematical Modeling of Sensitivity of Parameters in Diabetes and Hypertension Coinfection and Regularization of Blood Sugar and Pressure.**

4) Ogari[1], A, L, Karuri, N[2]. **([1]KyU, [2]DeKUT). In-door Air Pollution from Traditional Cook Stoves and Hindrances Towards Uptake of Clean and Improved Stoves: A Review.**

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2) Waweru, G[1], Kiiru, A[2]. ([1]**KyU, [2]University of Embu). Globalization Challenges for The Kenyan Textile Industry.**

3) Kimemia, M[1], Tumuti, D[2], & Bosibori, E[3]. **([1]KyU,[2,3]KU). Socio-Cultural Determinants of Male Enrolment in Fashion-Related Training in Murang'a County, Kenya.**

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2) Maina, M.& Kabata, D.**(KyU). Business Risks and Interest Rate Spread among Kenyan Commercial Banks.**

3) Kakiya, E[1], Misango, S[2]. **([1]Egerton University, [2]SEKU). Relationship Between Financial Leverage and Profitability of Listed Manufacturing Firms in Kenya.**

4) Muigai, R. G[2], Cherono, I[2]. **([1]KyU, [2]JKUAT). Effect of Foreign Exchange Rates Volatility on Share Prices of Listed Firms in Kenya.**

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2) Nuwemuhwezi, G.**(JOOUST). Viability of Bee Brood (Apismellifera) for Curl Bee Brood Additives to Boost Chicken Feed Ingredient for Enhanced Food Security.**

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Rapporteur	Mr. John Mwangi

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2) Nyaboga, E. N. & Nguu, E. K. (UoN). **Using Biotechnology Tools to Enhance Breeding and Sustainable Use of Yam (*Dioscorea* spp.): An Orphan but Highly Potential Food and Nutritional Security Crop in Kenya.**

3) Mwangi, J[1], Mecha, E[2], Muriu, S[3], Omwandho, C.A[4]. **([1]Pwani University, [2]UoN, [3]Kilifi County Hospital, [4]KyU). Cytokines Levels in Peripheral Blood of Tungiasis Infected Humans in Kilifi County.**

4) Kamau, S. M[1], Moraa, K[2], Menge, D[3]. **([1]KyU, [2]KNH, [3]Jericho Health Center). Factors influencing non-adherence of Tuberculosis Medication among Adults at Jericho Health Center.**

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2) Mbusi, E.T. **(KyU). The Response of Kenya's Construction Industry Output Growth Rate to Central Bank Base Lending Interest Rate (2007 – 2018).**

3) Kiwiri, F.W. **(KyU). Load Optimization Through Scale Level Monitoring and Real Time Response: A Case Study of Olkaria II.**

4) Kirori, Z. **(KyU). Improving Image Recognition Capacity in Convolution Neural Networks.**

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2) Karea, J. **(Michuki Technical Training Institute). Hospitality and Textile Technology for Sustainable Development: A Conceptual Approach.**

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2) Butali, P[1], Njoroge, D[2]. **([1]Garissa University, [2]KyU). Selective Hiring and Organizational Performance.**

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4) Odunga, P. **(KyU). Tourism and Value Addition in Rwanda's Economy.**

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2) Maina, S. & Karuri, H. **(University of Embu). Maize Performance in a Field Infested with Spiral Nematodes (*Scutellonema* Spp.).**

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DAY TWO: THURSDAY, SEPTEMBER 12, 2019

Preliminaries

- Arrival and registration
- Corrections on the program
- Make any announcements and changes
- PowerPoint presentations given to ICT staff for presentation

Coordinator: Dr. Agnes N. Mutiso

8:00am - 9.00 am	Registration
9:00am - 9:10am	**Welcoming Remarks** Deputy Vice Chancellor (ASA). **Prof. Charles O. Omwandho, PhD**
9:10am – 9:20am	**Opening Remarks** **Vice Chancellor, Prof. Mary Ndungu, PhD.**
9:20am-10:00am	**Presentation** ICT Application in Teaching and Higher Education **Prof. Charles O. Omwandho, PhD**
10: 00 am – 10: 30am	Health Break
10.30am - 1.00pm	Parallel Sessions
1.00pm - 2.00pm	Lunch/Health Break
2.00pm - 4.00pm	Parallel Sessions
4.00pm - 4.30pm	Plenary/ Closing
4.30pm	Tea/ Guests Leave at their Own Pleasure.

MID PARALLEL SESSIONS

11.00AM – 1.00PM

SUB-THEME	HEALTH
Venue	Academic Boardroom 1
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2) Ogolla, F.O[1], Omondi, C[2], Odhiambo, C[3]. **([1]Chuka University, Kenya, [2]KU, [3]TUK). Assessment of Wild Rodents End parasites in Kirimiri Forest in Embu County, Kenya.**

3) Kamau, E.W[1], Mworia, G.E[1], Maingi, J.M[2], Masinde, P.W[2]. **([1]Meru University of Science and Technology, [2]KU). Invitro Efficacy of Different *Warburgia Ugandensis Organic* Crude Extracts Against Tomato *Phytophthora Infestans* and *Alternaria Solani.***

4) Njuguna, S[1], Wanja, M[2], Mapesa, J[2]. **([1]Daystar University, [2]Kenya Methodist University). Influence of Patients' Rights Charter On Health Systems Responsiveness in Selected Counties in Kenya: Health Care Provider Perspective.**

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2) Mutuma, I. **(Africa Nazarene University, Kenya). Bridging Digital Learning Divide by Mobile Ad Hoc Networks (Manets): A Model.**

3) Bosire, R. N[1], Cheverikin, V. V[2]. **([1]KyU, [2]MISIS, Russia). Optimizing Structure and Mechanical Properties of Al-Mg Alloys.**

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SUB-THEME	ENTREPRENEURSHIP AND BUSINESS MANAGEMENT
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2) Chadwick, B.H. **(Kenya Marine and Fisheries Research Institute). Assessment of the Value Chain of Tilapia Fish as Food to the Local Market to Identify Investment Gaps in Lake Turkana, Kenya.**

3) Jesse, K[1], Iravo, A[2], Namusonge, G[2]. **([1]University of Embu, [2]JKUAT). Corporate Social Responsibility Strategy and Financial Performance of Deposit Taking SACCOs in Kenya.**

4) Ndolo, J[1], Njagi, E[2]. **([1]Mount Kenya University, [2]SEKU). Role of Government Environmental Regulations on Petroleum Supply Chain Management in Kenya.**

5) Waita, M. G[1]., Muchina, S[2]. Macharia, S[2]. **([1]KyU, [2]KarU). Cost of Capital, Firm Size and Financial Distress.**

SUB-THEME	AGRICULTURE AND ENVIRONMENT
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2) Ouma, G[1], Odhiambo, G. D[2], Musyimi, D[3], Oyunge, D[2], Wagai, S[3]. J. Kwach[4], Ogola, H[5]. **(Institute for Climate Change and Adaptation, University of Nairobi, [2]Great Lakes University of Kisumu, [3]Maseno University, [4] Kenya Agricultural Research Institute, Kisii, [5] Kenya Agricultural Research Institute,**

Kisumu, Kenya). An Analysis of Socioeconomic Factors Affecting Avocado Production around Lake Victoria Basin of Kenya with Special Emphasis on Flooding and Its Implications.

AFTERNOON PARALLEL SESSIONS

2PM - 5PM

SUB-THEME	HEALTH
Venue	Academic Boardroom 1
Chair	Dr. Elly Munde
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2) Butto, D., Maina, E & Murigi, M. **(KyU). Unintended Pregnancies among University Students: Sources and Implications for Health Education Programs.**

3) Mwangi, E. M, Wanja, T, Mapesa, J, & Kipruto, I. **(Kenya Methodist University). Citizen Engagement in Social Health Insurance Purchasing in Selected Counties in Kenya.**

SUB-THEME	STEM
Venue	Academic Boardroom 2
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Rapporteur	Ms. Irene Mwangi

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2) Mathooko, P. M. & Humphrey, N. K. **(JKUAT). Nairobi Effects of Liberalization of Airwaves on Media Indigenization, Entrepreneurship and Innovation in Kenya.**

3) Kagoiya, K. **(TUM). Home Gateway Solution to Secure and Reliable Patient Monitoring in a Medical Network.**

4) Musembi, N. S. **(KyU). Kenya Bayesian and Frequentist Approach to Time Series Forecasting with Application to Kenya's GDP Per Capital.**

5) Langata, D.C. **(KyU). Evaluation of Gaussianity of the Surface Electromyography Signal as Per the Angle of Inclination of the Muscle Fibers.**

SUB-THEME	ENTREPRENEURSHIP AND BUSINESS MANAGEMENT
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Rapporteur	Ms. Jemimah Maina

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2) Kabata, D & Maina, M. **(KyU). Determinants of E-Commerce Usage in the Kenyan Banking Sector.**

3) Ngigi, B. W. **(Kenya Methodist University). Contextual Influences of Scholarly Ambition on Entrepreneurship Education in Kenya.**

4) Ndung'u, G & Kiiru, G. **(KyU). Influence of Budget Constraints on Implementation of Strategic Plans among Mission Hospitals in Kenya.**

SUB-THEME	AGRICULTURE AND ENVIRONMENT
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1) Maina, H. & Karuri, H. **(University of Embu). Population Dynamics and Diversity of Free Living Nematodes in Sweet Potato under Different Management Practices.**

2) Gavamukulya, Y[1,2], Maina, E. N[1,3], El-Shemy, H. A[1,4], Wamunyokoli, F[1,5] & Magoma, G[1]. **([1]PAUSTI, [2]Busitema University, [3]University of Nairobi, [4]Cairo University, [5]Jomo Kenyatta University of Agriculture and Technology). Synthesis and Characterization of Nanoparticles from Extracts of Fruits of *Annona Muricata*: A Green Nano Biotechnology Approach.**

3) Mulambula, S., Gathungu, G. K, Ndukhu, H. O & Ogolla, F. O. **(Chuka University). Integrated Effects of Rhizobium Inoculation and Phosphorus Application on Tissue Content, Rhizobium and Phosphorus Use Efficiency in Soybean Production.**

DAY THREE: FRIDAY, SEPTEMBER 13, 2019

8.00AM - 5.00PM

Preliminaries

- Arrival and registration
- Welcoming guests on campus
- Corrections on the program
- Make any announcements and changes
- PowerPoint presentations given to ICT staff for presentation

Coordinator: Dr. Samuel W. Mburu

8:00am - 9.00 am	Registration
9.00am - 10.30am	Parallel Sessions
10.30am - 11.00am	Health Break
11.00am - 1.00pm	Parallel Sessions
1.00pm – 2.00pm	Lunch
2.00pm - 3.00pm	Parallel Sessions

MORNING PARALLEL SESSIONS

8.00AM – 10.30AM

SUB-THEME	HEALTH
Venue	**Academic Boardroom 1**
Chair	**Dr. Immaculate Marwa**
Rapporteur	**Ms. Molly Muiga**

1) Mwai, R. T[1], Maina, E. M[2]**. ([1]Kirinyaga County Referral Hospital [2]KyU). Factors Influencing Family Planning Services Utilization among Men in Kerugoya Ward; Kerugoya County.**

2) Lutz, K[1], Gronbach, J[1], Horne, F[1], Mecha, E. O[2], Eniko, B[1], Matthias, F[2], Steffan, G[2], Omwandho C. O.A[2,3], Oehmke, F[1], Hans-Rudolf T[1]. **([1]Justus-Liebig University of Giessen, Germany, [2]UoN, [3]KyU). Characterization of Cell Types in the Endometrium and Endometriosis.**

3) Kang'e, M. (**Kenya Methodist University). Role of Strategic Partnerships On Performance of Private Health Insurance Sector in Kenya.**

SUB-THEME	STEM
Venue	Academic Boardroom 2
Chair	Dr. Peter Wanjohi
Rapporteur	Ms. Rose Munyao

1) Nyumba, T. O. **(UoN /African Conservation Centre, Nairobi). Preliminary Assessment of Ecological Impacts of Transportation Infrastructure Development: A Reconnaissance Study of the Standard Gauge Railway in Kenya.**

2) Wainaina, P. M. **(KyU). Solar Radiation Prediction Models Analysis for Varying Climatic Conditions.**

3) Kinyili, M, & Kitavi, D. M. **(University of Embu). Precision of 3-Configurations with Respective Sub-Configurations of 2-Ring Concentric Planar Array in Direction Finding.**

SUB-THEME	ENTREPRENEURSHIP AND BUSINESS MANAGEMENT
Venue	Academic Boardroom 3
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Rapporteur	Mr. Martin Muchiri

1) Waweru, B. K, Maranga, V. & Mugambi, R. **(Kenyatta University). Relationship between Social Demographic Factors and Job Embeddedness of University Catering Employees in Nairobi City County, Kenya.**

2) Senaji, T.A. & Nzioki, S. C. **(Kenya Methodist University). Knowledge Management Capability, Demographics and Market Capitalizing Agility.**

3) Vundi, N. Z. & Muturi, W. M. **(Jomo Kenyatta University of Agriculture). The Impact of Financial Innovation on Monetary Sector Policy in Kenya.**

SUB-THEME	AGRICULTURE AND ENVIRONMENT
Venue	Academic Boardroom 4
Chair	Dr. Jotham Wasike
Rapporteur	Ms. Joy Sarah

1) Maina, J. M. **(KU). Factors Affecting Food Intake among Male College Students in Kenyatta University, Nairobi County.**

2) Waweru, C. & Lemein, P. **(UoE). Livestock-Wildlife Interactions in Maasai Mara National Reserve, Kenya.**

MID MORNING SESSIONS

11.00PM – 1.00PM

SUB-THEME	STEM
Venue	**Academic Boardroom 2**
Chair	**Mr. Zakary Kirori**
Rapporteur	**Mr. Geoffrey Muthoka**

1) Muchira, I. W Njoroge, W. K.& Munji, M. K. **(KyU). Crystallization Kinetics of In Se Bi Thin Films for Phase Change Memory (Pram) Applications.**

2) Obondi, G. O. **(KyU). A Review on Combating Insurance Fraud with Forensic Science.**

3) Okelo, B. **(JOOUST). On Properties of Hilbert Space Operators and Applications.**

4) Lao, H[1], Kivunge, B[1], Muthoka, G[2], Kimani, M[3]. **([1]UoK,[2]KU, [3]KyU). On the Number of Cyclotomic Cosets and Cyclic Codes over.**

SUB-THEME	AGRICULTURE AND ENVIRONMENT
Venue	**Academic Boardroom 4**
Chair	**Dr. Evelyn Maina**
Rapporteur	**Erastus Kariithi**

1) Kathuri, M. & Njeru M. K. **(Chuka University). Socioeconomic Determinants of Adoption of Eco-Friendly Farming Practices in Agroecosystems of Embu County, Kenya.**

2) Gichaba, V. M, Haggai, O. N & Muraya, M. **(Chuka University). Effect of Goat Manure Based Vermicompost on Soil Chemical properties in Garlic (Allium Sativum L.) Field in The Upper Eastern Region of Kenya.**

3) Ogolla, F. O[1], Omondi, C[2], Odhiambo, C[3]. **([1]Chuka University, [2]Kenyatta University, Technical University of Kenya). Incidence and Severity of Turcicum Leaf Blight Caused by *Exserohilum Turcicum* (pass.) Leonard and Suggs) on Sorghum Populations in Different Regions of Tharaka Nithi County, Kenya.**

4) Mburia, L. N. **(Wote Technical Training Institute, Kenya). Municipal Waste Disposal and Management for Environmental Sustainability.**

SUB-THEME	ENTREPRENEURSHIP AND BUSINESS MANAGEMENT
Venue	**Academic Boardroom 3**
Chair	**Dr. Gitau Muigai**
Rapporteur	**Mr. Dennis Kanyingi**

1) Kamau, J. G, Senaji, T.A & Nzioki, S. C. **(Kenya Methodist University). Knowledge Management Capability, Market Capitalization Agility and Competitive Advantage.**

2) Ngunjiri, N. **(University of Nairobi). The Relevance of Research to Policy Decision-Making, Formulation, and Implementation.**

3) Mburu, Z. M, Gongera, G. E & Ndegwa, J. **(Co-operative University of Kenya). The Relevance of Research to Policy Decision-Making, Formulation, and Implementation.**

CLOSING CEREMONY

VENUE: MAIN HALL

2:00pm - 3:00pm	Plenary
3:00pm - 3:20pm	Remarks from the Chair, Conference Organizing Committee: Way Forward DVC(ASA), **Prof. Charles O. Omwandho, PhD.**
3:20pm - 3:40pm	Closing Remarks Vice Chancellor, **Prof. Mary W. Ndungu, PhD.**
3:40pm - 4:00pm	Issuance of Certificates
4:00pm - 4:20pm	Vote of thanks by Representative of Participants
4: 20 pm – 4.40 pm	Vote of thanks from KyU
4.40pm	**Tea & Guests Leave at their own Pleasure**

SUB-THEME: HEALTH

Reduced Malaria Prevalence in School Children in Western Kenya: An Association with Present Malaria Control Approach

Munyekenye, G. O.[1], Chimbevo, L. M[2].

[1]Kirinyaga University, [2]Technical University of Mombasa, Kenya.

Correspondence: *gmunyekenye@kyu.a.Ke*

Abstract

Malaria control measures have improved in recent years due to intensified use of insecticide treated bed nets and change of first line malaria drug in Kenya. Few studies have evaluated the effects of these changes on overall parasitemia prevalence in population. We undertook a 10 months' parasitological survey in school going children at low- and at high altitude villages in Western Kenya to determine parasitemia prevalence and evaluate the control measures. There was difference in malaria prevalence among villages, high altitude villages had lower prevalence compared to the low altitude village. There was a significant relationship between parasitemia prevalence and bed net use among school going children. Prevalence decreased with increase in bed net use. Compared to historical data we observed a decline in malaria prevalence both at low- and at high altitude zones in Western Kenya. These observations suggest that there has been a decline in overall malaria parasitemia prevalence in Western Kenya. And increased bed net use and change of first line drug against malaria have had a positive effect on malaria prevalence in general population.

Keywords: Altitude, insecticide treated bed ne, artemisinin, parasitemia prevalence.

Cross Talk Between Bone Morphogenetic Proteins (Bmps) and TGF-βs/ Receptors in Human Endometrial and Endometriosis Cells

Mecha, E[2], Cong Sui[1], Omwandho, C. O. A[3], Hans-R. T[4] , Konrad, L[5]
[1,2,4,5]Justus-Liebig University, Giessen, Germany, [2]University of Nairobi, [3]Kirinyaga University, Kenya.
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Abstract

TGF-βs transduce their signals mainly through activation of Smad2 and Smad3. They can also strongly but only transiently induce phosphorylation and activation of Smad1, Smad5 and Smad8 (BMP-responsive Smads) in endothelial cells and epithelial cells, fibroblasts as well as epithelium derived cancer cells. These observations have raised questions on how activation of Smads1/5/8 by TGF-βs affect BMP responses. Previous studies have proposed a possible crosstalk of TGF-βs/BMP pathways which involve ALK-5 and formation of pSmad3-pSmad1/5 complexes. However, the location of cross-talk remains to be elucidated. This study sought to investigate location of cross-talk of the TGF-β **and BMP pathways and understand their possible roles in pathophysiology of endometriosis.** Immortalized human endometrial stromal (T-HESC), epithelial (HES), endometriotic stromal (22B) and epithelial (12ZVK) cell lines were treated with or without BMP inhibitors with or without TGF-β1 or TGF-β2, respectively, and cell numbers counted. The TGF-β**s/BMP interaction was investigated by quantification of** Plasminogen Activator Inhibitor 1 (PAI-1) secretion by the cells. Results showed that TGF-β1 or TGF-β2, respectively, increased PAI-1 secretion in all cell lines studied. Both BPM inhibitor and ALK-2 inhibitor demonstrated 100% inhibition of TGF-β1 or TGF-β2 induced-PAI-1 secretion in all cells lines tested while ALK-2 and ALK-6 inhibitors demonstrated partial effects at 40% and 25% to inhibition respectively while IgG1 (control) had no effect on TGF-β1 or TGF-β2 induced-PAI-1 secretion. The observation that BMP and ALK-2 inhibition completely blocked the TGF-β **induced PAI-1 secretion while ALK-3 and ALK-6 inhibitors only showed partial inhibition strongly suggests that ALK-2 is the point of cross talk between BMP and** TGF-βs pathways. This finding might provide new insights into the role of TGF-βs in pathophysiology of endometriosis. However, more studies are needed on BMP and other pathways in TGF-β signaling to elucidate the connection between BMP and TGF-βs since our study only gave a first glimpse into involvement of TGF-β signaling in endometriosis.

Keywords: Bone morphogenetic proteins, endometriosis**.**

Factors influencing non-adherence of Tuberculosis Medication among Adults at Jericho Health Center

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Abstract

Tuberculosis patients have decreasing compliance with treatment leading to emergence of multidrug resistant strains. Consequently, patients are dying of tuberculosis and the spread of the disease in the community is high. The Kenya TB defaulter rate is 15%. Jericho, Nairobi is one of the hospitals experiencing the challenges of TB drug incompliance.10% of TB patient's admissions in Jericho health center are due to TB drug non-compliance which has led to spread of infections and development of Multi-Drug Resistant status. The main objective in this study was to evaluate the factors that interfere with adherence of TB medication among adult patients suffering from TB at Jericho Health center, Makadara sub-county in relation to patient related, societal related, drug related and facility related. Descriptive research design was applied and simple random sampling method used to select respondents. Data was collected using questionnaires, analyzed using SPSS version 23 and presented in both inferential and descriptive statistics. The major side effects of TB medication (P=0.001), having a good relationship with the family (P=0.003), the treatment category (P=0.009), the easiest source of getting TB information (P=0.018), Health workers/community workers provide enough time to listen to problems (P=0.002) were found to be significant with the adherence to TB medication.

Keywords: Tuberculosis.

HBV Seroprofile and Genotype among Injection Drug Users in Coastal Kenya.

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Abstract

There is limited information about HBV sero-markers, clinical staging and genotypes in Kenyan injection drug users. This cross-sectional study, therefore, determined HBV sero-markers, clinical staging and genotypes between HIV-1 infected (n=157) and uninfected (n=214) injecting substance users in Mombasa city, Kenya. Injecting substance users were recruited via snowball method and their socio-demographic data recorded on questionnaires. Plasma samples were sero-tested for HBsAg, HBsAb, HBeAg, HBeAb and HBcAb using the HBV-5 panel rapid test cassettes. Clinical staging was based on serological profile of the five HBV sero-markers. Phylogenetic analysis was used to determine HBV genotypes in acute and chronic clinical stages. Frequency of HBsAg (P=0.004) and HBcAb (P=0.008) sero-markers were higher while that of HBsAb (P=0.019) sero-marker was lower in HIV-1 infected group compared to the uninfected group. Frequency of acute (P=0.033) and chronic (P=0.021) clinical stages were higher while that of vaccine type response stage (P=0.008) was lower in the HIV-1 infected group compared to the uninfected group. Only HBV genotype A clusters was detected, with higher frequency in the HIV infected group compared to uninfected group (P=0.009). In conclusion, HBsAg and HBcAb sero-markers and acute and chronic clinical stages are higher while HBsAb sero-marker and vaccine type response clinical stage are lower in HIV-1 infected compared to uninfected injecting substance users in Mombasa city. In addition, genotype A clusters is higher in HIV-1 infected compared to uninfected injecting substance users in Mombasa city in Kenya.

Keywords: Seroprofile, genotype

Influence of Patients' Rights Charter on Health Systems Responsiveness in Selected Counties in Kenya: Health Care Provider Perspective

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Abstract

Health care providers are frontline workers whose roles include ensuring health systems responsiveness. Responsiveness is one of the goals of health systems set out by WHO in 2000 though the role of health care providers in the implementation process has not been clearly documented. Patients' rights charter has been implemented in health systems for a while now. The objectives of the study were to establish health care providers awareness of patients' rights charter and establish how the health care provider practice of patients' rights charter influence responsiveness of health systems in primary care settings. An exploratory cross sectional descriptive study was conducted using a psychometric semi structured questionnaire to quantitative data from 62 health care providers in four tier 2 health facilities who were purposively sampled in two counties. Qualitative data was collected from four key informants in charges from the health facilities. Data was analyzed using SPSS 25. Results demonstrated that health care provider awareness of the content of patients' rights charter ($r = .612^{*}$, $P < .001$) and practice of patient's right charter ($r = .610^{*}$, $P < .001$) were statistically significant and influenced health systems responsiveness. On the individual responsiveness domains, health care providers did not regard access to social support as being influenced by the practice of patients' rights charter. ($r = 0.209$, $P < 0.001$) but it slightly correlated to awareness ($r = 0.294^{*}$, $P < .001$) of patients' rights charter. It was concluded that Implementation of patients' rights charter influences responsiveness of health systems. Effective governance of health systems requires to implementation of policies that incorporate monitoring of progress through documentation of practices that enhance both patients' rights and responsiveness. Documentation of best practice can be replicated in other primary care facilities support achievement of responsiveness by health care providers.

Keywords: Health systems.

Factors Affecting Food Intake among Male College Students in Kenyatta University, Nairobi County

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Abstract

Many lifestyle habits are formed in College and may persist into adulthood, thereby impacting on the health of students. Several studies have reported unhealthy dietary practices with high consumption of fast foods having high contents of fat, salt and simple sugars among college students. This study investigated factors affecting food intake in male college students at Kenyatta University, Kenya. The aim of the study was to determine socio-demographic and economic characteristics of the students as well as factors affecting food intake including cost of food, time, residence on campus and peer influence. The study employed a case study design. Study participants included male students, aged 19-25 years. Study instruments included questionnaire and interview. Results showed that cost of food and preparation time were the main factors affecting food intake. Students reported to frequently consume high amounts of refined carbohydrates for satiety and low amounts of fruits and vegetables which are more expensive. The most frequently consumed foods reported to be consumed every day were carbohydrates. Only 33.3% of students reported taking fruits every day while 53.3 % reported consuming vegetables daily. Skipping of meals was also reported and could be associated with factors such as residing off-campus and food preparation time constraints. It is recommended that Universities come up with measures to curb unhealthy eating habits on campus by availing more balance foods on campus cafeteria.

Keywords: Food intake, male, college, students.

The Use of Anaerobic Conditions and Plasma Environment During Tea Processing to Enhance Polyphenols in Made Teas

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Abstract

Tea prepared from leaves of *Camellia sinensis* is the most consumed beverage in the world, second only to water. Health benefits associated with tea consumption include reduced risk of cancer, type 2-diabetes, cardiovascular diseases, obesity and inflammation. Polyphenols in tea are responsible for observed activity and their content is reduced during the fermentation process of making tea. Green tea is unfermented and thus has high content of polyphenols, whereas black tea is fully fermented. Use of tea processing techniques that preserve or enhance the content of beneficial polyphenols will provide teas that can be used to mitigate against the aforementioned diseases. This study sought to review tea processing techniques that utilize plasma and anaerobic environment to produce made teas with high content of beneficial polyphenols. Literature review was carried out in PubMed, Science direct and google scholar to obtain peer reviewed papers on tea processed under anaerobic conditions and plasma environment. Previous studies reported that tea processed anaerobically using nitrogen gas had high contents of □-aminobutyric acid (GABA), a hypotensive compound, and alanine. GABA tea is also rich in polyphenols that withering tea anaerobically in nitrogen gas with or without plasma environment produced green tea having high content of polyphenols compared to purple, black and Oolong tea and that pickled tea produced by anaerobic solid-state fermentation has high contents of gallic acid (25.7g/kg) and free amino acids beneficial to human health. Thus tea processed anaerobically using nitrogen gas and plasma environment is rich in GABA, and polyphenols beneficial to human health. This can be one way of producing value added tea in the Kenyan market. Further studies are being undertaken to evaluate the anticancer properties of Kenyan polyphenol enriched teas.

Keywords: Camellia sinensis, anaerobic.

Cytokines Levels in Peripheral Blood of Tungiasis Infected Humans in Kilifi County

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Abstract

Tungiasis is a zoonotic parasitic infection caused by jigger flea and usually associated with poor socio-economic settings. Bacterial super-infections are common occurrence in tungiasis triggering a myriad of immunological reactions in the host. This study investigated the levels of cytokines produced due to tungiasis infection in Ganze Sub County, Kilifi County in Coastal Kenya. Seventy-two participants were enrolled and grouped into two groups; 37(51.3%) jiggers free (non-infested group) with had no history of illness for at least six months and 35(48.7%) jiggers infested group. The jiggers infested participants were further subdivided into two; 18(51.4%) with high jigger infestation (> 5 tungiasis lesions) and 17(48.6%) were having low jigger infestation (< 5 tungiasis lesions). Blood plasma samples from participants were subjected to indirect ELISA to determine the levels of anti-Inflammatory cytokines (Interleukin – 4 (IL4) and Interleukin - 6(IL6),) and Inflammatory cytokine levels (Interferon gamma (IFN-γ) and Tumor Necroting Factor alpha (TNF-α,). Tests were run in duplicate three times for each sample and the average for cytokine levels determined. Analysis by Kruskal – Wallis statistical method showed no significant difference in (TNF-α, IFN–γ and IL4) levels in the highly jigger infested individuals, (P= > 0.1). For lowly infested individuals, there was no significance difference in comparison between IFN-γ to IL4 and IFN-γ to TNF-α, (P = 0.18221, P= 0.21358) respectively. However, there was significant difference between IL4 - TNF-α, (P= 0.00003). We concluded that tungiasis causes elevation in levels of IL4, TNFα and IFNγ with no change in the levels of IL6. However, in highly infested patients, there is a significant rise in IL4 while in lowly infested individuals; there is no rise in IL4 levels.

Keywords: Tungiasis, tunga penetrans, cytokine.

Unintended Pregnancies among University Students: Sources and Implications for Health Education Programs

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Abstract

Unintended pregnancies among young girls remains a serious public health concern worldwide. Early child bearing has been associated with increased vulnerability to HIV/AIDS in sub Saharan Africa. Moreover, HIV infection and pregnancy are indicators that young people are engaging in unprotected sex. Notably, 34% of all new HIV infections in 2017 occurred among young people. Previous studies on adolescents and youths SRH have indicated that only about two thirds of unintended pregnancies end in childbirth, while a third end up in unsafe abortions further complicating the problem. Despite this, many young people still engage in unsafe sex, and it's not uncommon to notice many cohabiting couples within University set ups. Many health communication interventions have focused more on intergenerational sex and sex for favors (*sponsors)* while ignoring unsafe sexual relationships among cohabiting students that is slowly becoming a norm. This study sought to establish sources of unintended pregnancies among university students. Cross-sectional descriptive study was conducted between the months of April and July, 2018. Snowballing technique was used to reach 74 currently pregnant and student mothers below 25 years studying at Kirinyaga University in Kenya. 64% of the respondents come from single parents' family with a majority, (82%) from mother only families. 24% reported that they had their first sexual encounter before 18 years of age. 82 % of the respondents reported that the men responsible for their pregnancies were aged 24-26 years. 76%, of these men were students while 12% were casual workers within the neighboring community. 29% of the girls were living together (cohabiting) with their boyfriends during the time of conception. The main sources of health information to the respondents were social media and health care professionals at 26% and 17% respectively. Only 46% used a contraceptive method before pregnancy. Male condom was widely used at 62% followed by Safe days (natural methods) at 30%. The main source of unintended pregnancies among University students are their peers, contradicting the much held belief of transactional/intergenerational sex. There is need for urgent review of our health education and communication strategies to shift focus to cohabitation among University students.

Keywords: Unintended pregnancies, sex.

Factors Influencing Family Planning Services Utilization among Men in Kerugoya Ward; Kerugoya County.

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Abstract

Family planning is one of the components of reproductive health services and its understanding is key to family health. Changes in both men`s and women`s knowledge, attitude and behavior are necessary to achieving the harmonious partnership of men and women. It is essential to improve communication between men and women on issues of sexuality and reproductive health and the understanding of their joint responsibility as equal partners in public and private life. Thus involving males in family planning could lead to better family outcomes since men are the main decision makers in the family even in issues of sexuality. Studies conducted elsewhere suggests Family Planning services are traditionally presented within the context of maternal and child health clinics, thereby negates male participation. Male involvement would potentially help not only in accepting contraceptives but also in its use and continuity. In Kenya there is low utilization of Family Planning services by men, thus in 2017 only about 2% of contraceptive users in Kenya were men. The same applies to Kirinyaga County where about 3% of contraceptive users were men. This study investigated factors that affect utilization of family planning services by men in Kerugoya Ward of Kirinyaga County, Kenya. This is a descriptive cross-sectional study using a quantitative approach, the study population were men whose wives were within child bearing age and resided in Kerugoya ward in Kirinyaga county. Simple random sampling method was employed and sample size was determined by Fischer's method. Data was collected using questionnaire. Descriptive statistics were analyzed whereby measures of central tendency like means, modes and medians were calculated. Inferential statistics involved seeking associations with family planning utilization. Permission to carry out the research was sought from the ethical and research committees to ensure the study participants were safeguarded. Results showed that men preferred condoms as a family planning method over other available methods and the key barriers to utilization of family planning services by men in Kerugoya town were mainly negative perceptions towards FP by men, a belief that male family planning methods were ineffective and the belief that FP as a woman's affair.

Keywords: Family planning.

Role of Strategic Partnerships on Performance of Private Health Insurance Sector in Kenya.

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Abstract

Strategic partnership is necessitated by the need for an organization to achieve its goals while leveraging on resources of another organization. Strategic partnership can be viewed as a tool for competitive advantage as firms utilize each other's core competence and specialization to support the competitiveness of the activities concerned. This study sought to establish the influence of transient advantage on performance specifically, the role of strategic partnerships on performance of private health insurance companies. The dynamic capabilities view of the firm and institutional theory were used to anchor the study while a descriptive survey design was adopted in the study targeting a population comprising managers, assistant managers and supervisors. Four respondents were drawn from each of the five departments, namely sales, strategy, finance, operations and customer service departments in the 19 private insurance companies where data was collected from a sample of 308 out of the 380 that were targeted. The analyzed data found that strategic partnerships did not significantly (p >0.05) predict performance of private health insurance sector in Kenya. Strategic partnerships had positive but insignificant predictive power on performance. It was recommended that firms should strengthen these dynamic capabilities to level where their influence on performance can be significant and health insurance firms should strategically partner with entities that share the same goals and objectives and are culturally compatible.

Keywords: Strategic partnerships, dynamic capabilities, transient advantage, health insurance.

Facilitation Strategies and Challenges in the Management of Chronic Comorbid Conditions (Diabetes and Hypertension) in Kenya.

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Abstract

Background: management of chronic conditions requires a comprehensive care provision to both at risk and affected. Comorbidity of non- communicable diseases pose a new global challenge to health systems, particularly those in resource limited settings. The effort towards provision of health for all to meet global goal of universal health coverage and the big four government agenda requires an in-depth comprehension of broad structural and general conditions which may challenge and facilitate the management of chronic comorbid conditions within the health care settings. The purpose of this paper is to describe facilitation strategies and challenges in the management of chronic comorbid conditions (Diabetes and Hypertension) in primary health care settings in Kenya. The study adopted a constructivist, qualitative approach and a combination of focused ethnography and grounded theory research designs. Ethnography design was used during data collection utilizing the following triangulated data collection methods: participant observation; structured interviews, document analysis and focus group discussion. Study used constant comparative method in the field to ensure rich data collection. The study sites comprised; seven health care facilities and 40 informants (patients, care providers and administrators) who were purposively selected in Nandi County, Kenya. Data was analyzed using Open, axial and selective coding as presented in Strauss and Corbin substantive model. The study results were affected by Family involvement in care, government commitment to fund health resources, accessibility to chronic care services, community participation and involvement, and preparedness for self-management. Limited knowledge on comorbid conditions, belief systems, cost implications, and provider-patient perceived factors. Results of this study were also important forms the basis for strategic planning towards improving chronic care and improving the quality of life for people living with multiple comorbid chronic conditions.

Keywords: Strategies, challenges, management, chronic comorbid conditions, Kenya.

Assessment of Coliforms Bacteria Contaminant in Nkenye Stream in Meru South, Kenya

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Abstract

Access to portable water remains a major global concern due to increased rate of water pollution contributed to by human pressure such as accelerated urbanization, high population, industrialization and intense agricultural activities that destroy riparian zones thus exposing the rivers and streams to toxic and pathogenic pollutants released from untreated organic and inorganic waste. Exposure of river and stream used for drinking water to pollution is detrimental to both aquatic plants, human consumers and animals inhabiting water bodies. Nkenye stream in Meru South is depended upon for supplying water to fish ponds constructed along it, irrigation and domestic use to the neighboring homesteads. However, little attention has been paid to ascertain the quality of its water despite the stream being located in an urban area with high exposure to pollutants. Pressure on Nkenye wetlands ecosystem that supply water to Nkenye stream has seen major destruction of riparian leaving zones just few plant communities such as Commelina banghalensis whose water purification potential is not well known. Based on the above fact, a study was conducted to determine water quality of Nkenye stream based on the presence of feacal and total coliform. Samples were collected at designated locations using ecological survey method and taken to Chuka university for evaluation. Coliform analysis of water samples was done by most probably number method using Macconkey purple broth at botany laboratory, Chuka University. Results were analyzed by General linear model (GLM) on Statistical analysis system (SAS) version 9.4 and significance means separated by Least significance difference (LSD) [alpha = 0.05]. Faecal coliform were found not to conform with WHO standards of 0 cfu/100 ml as the mean of 10 cfu/100 ml was observed for the entire stream. Occurrence of these bacteria in water indicate water deterioration and presence of many water-borne pathogens that needs immediate attention. Considerable amount of chemical was observed in the root samples of Commelina banghalensis showing that the plant can be utilized in removal of chemicals in the stream. It is recommended that local authorities particularly Tharaka Nithi county government should provide waste management disposal systems and policies that prohibit direct discharge of untreated effluents to the stream.

Keywords: Water quality, coliform bacteria, Nkenye stream, Meru South, Kenya.

Evaluation of Gaussianity of the Surface Electromyography Signal as Per the Angle of Inclination of the Muscle Fibers.

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Abstract

The study of Electromyography (EMG) signals can be useful for clinical/biomedical applications, prosthesis/rehabilitation devices, and modern human computer interaction, among others. They are acquired from activity of muscles after an electrical stimulation by use of electrodes for detection purposes. The purpose of this study was to evaluate the effect of inclination of muscle fibres on the degree of gaussianity of EMG signal using the parameter of Kurtosis and the estimate the effects of motor unit recruitment thresholds and the level of voluntary muscle contraction on the degree of gaussianity of the surface EMG signal. Results showed that gaussianity of EMG signal is different as the angle of inclination is varied from 0° to 180° and that the surface EMG signal is more Gaussian for a lower recruitment threshold of 30%, which is less Gaussian for a higher recruitment threshold of 70%. With a high level of voluntary muscle contraction, the degree of gaussianity is high compared to the lower level. This paper provides better understanding of the behavior of surface EMG signals that will be useful for researchers seeking to improve performances in the clinical/biomedical applications, prosthesis/ rehabilitate sense and human computer interactions.

Keywords: Electromyography, gaussianity, muscles, kurtosis.

Characterization of Cell Types in the Endometrium and Endometriosis

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Abstract

The human endometrium is composed of several different cell types which can be categorized into stromal and epithelial cells, which are only moderately characterized. Endometriosis is a disease characterized by presence of endometrial

glands and stroma outside of the uterus. Irespective of location, endometriotic glands almost always resemble uterine endometrial glands. However, it is puzzling, that endometriotic lesions show variations in colour, depth of invasion, adhesions, ovarian cysts, and different epithelial to stromal cell ratios to extreme case of stromal endometriosis. To analyse which cell types are involved in pathogenesis of endometriosis, we characterized stromal composition and assessed epithelial phenotype in order to evaluate epithelial-mesenchymal transition (EMT), which is characterized by loss of epithelial and acquisition of mesenchymal cell characteristics. Quantification of eutopic endometrial stroma of non endometric cases showed a high percentage of stromal cells positive for CD140b (80.7%), and CD10 (67.4%), a moderate number of CD90-positive cells (57.9%) and very few □-smooth muscle actin-positive cells (8.5%). These values are highly similar to cases with minimal differences. There were are no significant differences in the composition of CD140b and CD10-positive stromal cells between the eutopic endometrial stroma and the three different endometriotic entities (ovarian, peritoneal and deep infiltrating endometriosis), except for a significant difference between CD10-positive stromal cells in peritoneal compared to ovarian lesions. There were no differences in keratin 18 (K18), K19 and mucin-1 (MUC1) content between endometrium with and without endometriosis. Although no difference was observed in K18 levels in endometrium and endometriotic lesions. K19 and MUC1 were significantly decreased in the endometriotic lesions compared to endometrium. Expression of epithelial markers in all investigated tissues, regardless of the pathological condition, clearly indicates no loss of the epithelial phenotype. The ZEB1 increase in endometriotic lesions, especially in deep infiltrating endometriosis, on the other hand suggests a role of partial EMT in the development of endometriotic lesions, possibly connected with of invasive capabilities or stemness. Taken together, the marker signature of eutopic endometrial and endometriotic stromal cells resembles mostly mesenchymal stromal cells and the proportion of the different stromal cell types in the endometrium with or without endometriosis does not differ significantly. This suggests that the stromal eutopic endometrial microenvironment does not contribute to pathogenesis of endometriosis. Although we found some hints for partial EMT, we did not observe severe loss of the epithelial cell phenotype. Hence, we propose, that EMT is not a main factor in the pathogenesis of endometriosis.

Keywords: Cell types, endometrium,endometriosis.

Assessment of Coliforms Bacteria Contaminant in Nkenye Stream in Meru South, Kenya

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Abstract

Access to portable water remains major global concern due to increased rate of water pollution contributed for by human pressure such as accelerated urbanization, high population, industrialization and intense agricultural activities that destroys riparian zones thus exposing the rivers and streams to toxic and pathogenic pollutants released from untreated organic and inorganic waste. Exposure of river and stream used for drinking water to pollution is detrimental to both aquatic plants, human consumers and animals inhabiting water bodies. Nkenye stream in Meru South is depended upon for the use of its water in supplying fish ponds constructed along it, supplying water used for irrigation and provision of water for domestic use to the neighboring homestead. Nonetheless, little attention has been accorded to a certain the quality of its water despite of the stream being located in an urban area with high exposure to pollutants. Pressure on Nkenye wetlands ecosystem that habour Nkenye stream has seen major destruction of riparian leaving just few plant communities such as Commelina banghalensis whose water purification potential is not well known. Based on the above fact a study was conducted to determine water quality of Nkenye stream based on the presence of feacal and total coliform. Samples were collected at designated locations using ecological survey method and taken to Chuka university for evaluation. Coliform analysis of water samples was done by most probably number method using Macconkey purple broth at botany laboratory, Chuka University. The results obtained were analyzed by General linear model (GLM) on Statistical analysis system (SAS) version 9.4 and significance means separated by Least significance difference (LSD) [alpha = 0.05]. Feacal coliform were found not to conform with WHO standards of 0 cfu/100 ml as the mean of 10 cfu/100 ml was observed for the entire stream. The occurrence of these bacteria in water only indicate water deterioration but also an indication of the presence of many water-borne pathogens that needs immediate attention. Considerable amount of chemical was observed in the root samples of Commelina banghalensis this shows that the plant can be utilized in removal of chemicals in the stream. The study recommends that local authorities particularly Tharaka Nithi county government should provide waste management disposal systems and policies that prohibit direct discharge of untreated effluents to the stream course.

Keywords: Water quality, coliform bacteria, Nkenye stream, Meru South, Kenya.

SUB-THEME: AGRICULTURE AND ENVIRONMENT

Effect of Operating Cost Management on Financial Performance of Sweet Potato Marketing Cooperatives in Kenya

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Abstract

Sweet potato production and sale in Kenya, is a major economic activity that should be creating employment thus increasing GDP. In the recent past, there have been renewed efforts by the government and other players to promote production of traditional high value crops of which sweet potato is one. Thus this study sought to determine the influence of operating cost management on performance of sweet potato marketing cooperatives in Kenya. Using a descriptive panel research design. Secondary data was used for analysis. The target population was four sweet potato marketing cooperatives with a total population of one thousand two hundred and forty-five (1,245) sweet potato farmers registered as at December, 2015 by the Commissioner of cooperatives in Kenya comprising of Homabay, Bungoma, Busia and Siaya counties which also formed the study target units. Census sampling was used to select sample of the population. Secondary data covering the ten year-period, 2006-2015 was obtained and analyzed using multiple panel regression models. Limitations faced during data collection included high illiteracy levels amongst cooperative members. This was controlled by taking the officials through the facets of operating cost management to have them understand the concepts under enquiry. Results showed that operating cost management had significant influence on return on investment, a measure of financial performance of sweet potato marketing cooperatives in Kenya and tests for significance also showed that the influence was statistically significant. It is recommended that all sweet potato marketing cooperative officials and members be trained on aspects operating cost management.

Keywords: Operating cost management, financial management, marketing cooperative societies.

Viability of Bee Brood (Apismellifera) for Curl Bee Brood Additives to Boost Chicken Feed Ingredient for Enhanced Food Security

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Abstract

All edible insects and honey bees are important to our food system. This study seeks to investigate the link between pest management practices in apiary systems and entomophangy (the human consumption of insects). The study will provide background information on beekeeping and entomophagy, examine a sustainable a mite control practices called drone brood culling. This practice involves establishment of drone brood as varroa mite control trap and then removing drone, diseased, damaged bee comb from Colonies for varroa mite control. Beekeepers will provide samples of worker and drone brood combs to examine the mite levels in the two brood types and whether the cull bee brood acts as a trap. In addition, the impact on the levels will be examined to elucidate ways of lowering mites' levels at different seasons, examine the willingness of beekeepers to utilize culled bee brood into formulation of poultry feed additive known curl brood additives and willing to sell their culled brood to research centre, then evaluate how this practice will be implemented and explores proper ways in which curl brood can be better integrated into a sustainable feed or food system. Results will be presented in graphs and tables reflecting effectiveness of the methods of controlling mites for effective production of bees and feed nutritional composition.

Keywords: Bee brood (Apismellifera), additives, chicken feed, food security.

Livestock-Wildlife Interactions in Maasai Mara National Reserve, Kenya.

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Abstract

This study was conducted to assess livestock-wildlife interactions in the Maasai Mara National Reserve (MMNR), Kenya. It aimed at determining causes of livestock incursions into MMNR, effects of interactions between livestock and wildlife in grazing areas and measures to control livestock grazing in MMNR. Data was collected using questionnaires and interviews. Structured questionnaires were administered to 14 randomly-selected households from each of three villages surrounding MMNR, namely, Oloosek, Kaboori and Oltepesi. Sampling was based on households situated within 5km from MMNR. Simple Random Sampling (SRS) was used to select the households to administer questionnaires. An elder from each of the three villages was purposively selected and interviewed. Data were sorted and analyzed using Chi-square. Results revealed that shortage of grazing areas (40%), proximity to MMNR (29%), drought (16%) and inadequate land (15%) led to livestock grazing in MMNR. Livestock grazing had both negative and positive impacts on wildlife and livestock in MMNR. Negative impacts included; livestock depredation (36%), disease/parasite transmission (29%), displacement of wildlife from their habitat (20%) and competition for pasture (19%). Positive impacts included increased vigilance for wildlife by herders (37%). Measures instituted to mitigate negative impacts of livestock grazing on both wildlife and livestock were not effective (χ^2 =2.381, df =1, p=0.123). Mitigation measures suggested included increasing grazing penalties, deployment of additional rangers to keep livestock away and awareness-raising among the Maasai community. It is recommended that alternative livelihood strategies be considered for the Maasai, large-scale management of Maasai livestock, incorporating fewer animals, improved breeds, rangeland management and better marketing/pricing strategies for the livestock.

Keywords: Livestock grazing, impacts, wildlife, Maasai Mara National Reserve, Kenya.

Integrated Effects of Rhizobium Inoculation and Phosphorus Application on Tissue Content, Rhizobium and Phosphorus Use Efficiency in Soybean Production

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Abstract

A field experiment was conducted at Chuka University farm to determine the effect of integration of rhizobium inoculation (R) and triple superphosphate (TSP) on tissue content (TC), rhizobium and phosphorus use efficiency (PUE) in soybean production in Meru South Sub County. Two trials were done between March-August 2018. The objective was to determine the effect of integrating effect of R and TSP on TC, symbiotic efficiency and PUE in soybean production. Treatments included; three concentrations of TSP (0, 20 and 30 kg^{-} ha^{-1}), and concentrations of rhizobia (0, 100 and 200 g ha^{-1}) either applied alone or in combination and soybean genotypes (SB19 and SB24). Trials were laid out in an RCBD in split-split plot arrangement and each treatment replicated thrice with genotypes assigned main plot, R and TSP in split plots. Data collected was subjected to analysis of variance using the Scientific Analysis System and significantly different means separated using Tukeys test at $P \leq 0.05$. Results showed significant difference in nitrogen and phosphorus content, rhizobia and PUE in SB19 and SB24 in both trials at $P \leq 0.05$. The highest nitrogen TC of between 1.73% and 9.10% was observed when R and P was applied at concentrations of 200 g and 30 ha $^{-1}$ kg in both trials. R and TSP at concentrations of 200 g and 30 kg per ha resulted in highest phosphorus content of between 849.6 and 955.0 ppm in both trials. The SB24 had the highest symbiotic efficiency of 207 and 261 ppm compared to SB19 of 201 and 227 ppm in both trials. The PUE was highest when R and P was applied at concentrations of 200 g and 20 kg and 200 g and 30 kg per ha for SB19 and SB24 soybean in trials I and II respectively. Co-application of R and P at concentrations of 200 g and 30 kg P/ha and adoption of SB24 showed potential of enhancing soybean productivity.

Keywords: Tissue content, symbiotic and phosphorus use efficiency, genotypes**.**

Socioeconomic Determinants of Adoption of Eco-Friendly Farming Practices in Agroecosystems of Embu County, Kenya

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Abstract

Agriculture depends on and influences a number of environmental resources including water, land, biodiversity as well as production technologies and management skills. Given the vast global area under agriculture, the influence of agriculture on overall environmental sustainability cannot be overlooked. Environmental challenges such as pollution, soil erosion, soil acidification, low agricultural production and unsustainability of the agricultural ecosystems, have been associated with conventional farming practices. To address these environmental challenges, environmentalists have mooted Eco-friendly Farming Practices (EFFPs) as possible alternatives to conventional farming approaches that have greatly been associated with aforementioned challenges. This study was conducted among households of Embu County in Kenya to determine the socio-economic factors that influenced adoption of EFFPs. Earlier studies had indicated clearly that Embu County was experiencing soil erosion, pollution and soil acidification, yet EFFPs had been introduced to counter these environmental challenges. The study sought to determine the influence of socioeconomic factors on adoption of the EFFPs. Ex post facto research design was used. Through multi-stage random sampling, 402 household heads were selected and all the 32 extension officers in the area were interviewed. Average income from agriculture, gender, farming experience, level of education, size of the farm, age and primary were statistically significant (at 5% significance levels) in influencing adoption of EFFPs among households of Embu County. It was concluded that socioeconomic factors significantly influenced adoption of EFFPs among households of Embu County. There is therefore a need to consider house hold characteristics in designing effective environmental programs in the county.

Keywords: Socioeconomic, farming practices, agroecosystems.

Firm Seizing Capabilities for Competitive Advantage of Agriculturally Intensive Retail Enterprises

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Abstract

Kirinyaga County is agriculturally enriched with 90% of its population depending on agriculture for food, income generation and livelihood. However, competitiveness of these enterprises has not been realized due to the constraints caused by inappropriate capabilities thus inhibiting the competitiveness in the values chain. This paper examined how firm seizing capabilities influences competitive advantage in small agriculturally intensive enterprises (SAIE's) facing dynamic situations in the emerging and rapidly growing retail market. Specifically, this study focused on three hypothesized seizing capabilities, which were; knowledge, resources and innovations and their effect on competitive advantage among SAIE's within a developing economy given the business environmental pressures. The study objectives were to determine the direct influence of knowledge, resources and innovations capabilities on competitive advantage of SAIE's. The research was descriptive with the target population being the 431 FMCG agricultural intensive retail enterprises registered with Kirinyaga County. Stratified random sampling technique was used to select a sample of 120 enterprises and data collected by use of questionnaires and then analyzed using multiple regression analysis and tested hypotheses. The study concluded the following; in order to set up successful businesses, the owners must first put the seizing capabilities into practice; SAIE's are very slow to detect fundamental shifts in their industry; SMREs have limited capabilities to effectively develop new knowledge or insights that have the potential to influence their competitive position; despite the SAIE's showing boldness in their efforts to maximize in competitive advantage the implementation of seizing capabilities was the hardest part for small and medium-retailing enterprises in Kenya. Majority of the SAIE's were unable to identify valuable capability elements to connect and combine them in new ways, implement new kinds of management methods that are which are more responsive within their business processes and finally the enterprise's capabilities determine the potential scale and scope of firm level competitive behavior, since the availability of a firm capability can either facilitate or constrain activities, such as responses to competitive attacks. The study thus recommended that; on seizing capabilities there should be more business forums in order to understand their changing trends within their business operational environment and detect fundamental shifts in their industry; on seizing capability SAIE's, need to frequently acquire knowledge about their competitive and market trends from external sources so as to be able to identify and acquire external knowledge. Also identify valuable capability elements to connect and combine them in new ways, change their marketing strategies, implement new

kinds of management methods that are which are more responsive within their business processes; managers should have the understanding of their firm's seizing capabilities to drive managerial competitive response decisions since they are expected to undertake their competitive responses based on the evaluation of those capabilities that they perceive as most distinctive or superior related to their competitors.

Keywords: Firm seizing, competitive advantage, intensive retail enterprises.

Exploring the Genetic Diversity of Common Bean Germplasm: An Important Food and Nutritional Security Legume Crop in Kenya

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Abstract

Common beans is an important legume crop used as a source of protein, vitamins and other beneficial nutrients among resource poor populations in Kenya. Despite its nutritive and economic value, very little information is available on the genetic diversity of Kenyan common bean germplasm using molecular markers. Evaluation of genetic diversity among Kenyan common bean germplasm could provide useful information for genetic improvement. The aim of this study was to characterize and evaluate the genetic diversity of common bean germplasm from different geographical regions of Kenya using start codon targeted (SCoT) markers. A total of 30 common bean accessions were used. A set of 36 SCoT primers were tested of which 17 primers gave reproducible amplification which were further used for diversity analysis. The 17 SCoT primers generated a total of 224 amplification bands, of which 95% were polymorphic, indicating high genetic variation among the tested accessions. Polymorphism information content ranged between 0.60 and 0.85 with an average of 0.73 indicating that all the primers were informative. Pair-wise genetic similarity values ranged between 0.264 and 0.734 with a mean of 0.515. The principal component analysis (PCA) and Un-Weighted Pair Group Method with arithmetic mean (UPGMA) showed that the germplasm divided into 2 main clusters. Analysis of molecular variance showed a significant difference across accessions with a high within population variation. This study revealed genetic variation among the studied accessions, which can be exploited for common bean improvement in breeding programs.

Keywords: DNA fingerprinting, genetic variation, phaseolus vulgaris, SCoT.

Using Biotechnology Tools to Enhance Breeding and Sustainable Use of Yam (*Dioscorea* Spp.): An Orphan but Highly Potential Food and Nutritional Security Crop in Kenya.

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Abstract

Yam (*Dioscorea* spp.) in Kenya is a neglected crop, despite having a lot of potential for providing food security and income to resource-poor farmers. Yam tubers are nutritionally rich and a major source of dietary fiber, carbohydrates, vitamin C and essential minerals. Yam production is limited by several viral and fungal diseases, pests such as nematodes and poor soil fertility. Genetic improvement of yam through conventional breeding is challenging due to long growth cycle, dioecious and poor flowering nature, polyploidy, vegetative propagation and heterozygous genetic background barriers. Biotechnology offers a wide range of opportunities that can help yam become a better crop for a constantly changing world. The objective of this study was to develop an *Agrobacterium*-mediated transformation of yam (*Dioscorea rotundata*). Two cultivars of *D. rotundata* were transformed using *Agrobacterium tumefaciens* strains EHA105 and LBA4404 harboring the binary vectors containing β-glucuronidase (GUS) reporter gene. Shoots were regenerated on induction and elongation media with appropriate concentrations of antibiotics and subsequently rooted on medium supplemented with selection agent. Polymerase chain reaction (PCR) analysis and histochemical assay for GUS activity of plant tissues were used to confirm success of transformation. Expression of *gusA* gene in transgenic plants was also checked by reverse-transcriptase (RT)-PCR analysis. Transformation efficiency varied from 10.2% to 18.2% depending on the cultivars, selectable marker genes, and the *Agrobacterium* strain used for transformation. We report an efficient and reproducible protocol for genetic engineering of *D. rotundata*, which provides a useful platform for future improvement of this economically important food and nutritional security crop.

Keywords: Axillary buds, dioscorea rotundata, stable transformation.

The Use of Anaerobic Conditions and Plasma Environment During Tea Processing to Enhance Polyphenols in Made Teas

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Abstract

Tea prepared from leaves of *Camellia sinensis* is the most consumed beverage in the world, second only to water. Health benefits associated with tea consumption include reduced risk of cancer, type 2-diabetes, cardiovascular diseases, obesity and inflammation. Polyphenols in tea are responsible for observed activity and their content is reduced during the fermentation process of making tea. Green tea is unfermented and thus has high content of polyphenols, whereas black tea is fully fermented. Use of tea processing techniques that preserve or enhance the content of beneficial polyphenols will provide teas that can be used to mitigate against the aforementioned diseases. This study sought to review tea processing techniques that utilise plasma and anaerobic environment to produce made teas with high content of beneficial polyphenols. Literature review was carried out in PubMed, Science direct and google scholar to obtain peer reviewed papers on tea processed under anaerobic conditions and plasma environment. Previous studies reported that tea processed anaerobically using nitrogen gas had high contents of □-aminobutyric acid (GABA), a hypotensive compound, and alanine. GABA tea is also rich in polyphenols. that withering tea anaerobically in nitrogen gas with or without plasma environment produced green tea having high content of polyphenols compared to purple, black and Oolong tea and that pickled tea produced by anaerobic solid-state fermentation has high contents of gallic acid (25.7g/kg) and free amino acids beneficial to human health. Thus tea processed anaerobically using nitrogen gas and plasma environment is rich in GABA, and polyphenols beneficial to human health. This can be one way of producing value added tea in the Kenyan market. Further studies are being undertaken to evaluate the anticancer properties of Kenyan polyphenol enriched teas.

Keywords: Anaerobic conditions, plasma environment, tea processing, polyphenols, teas

Effect of Goat Manure Based Vermicompost on Soil Chemical Properties in Garlic (Allium Sativum L.) Field in the Upper Eastern Region of Kenya

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Abstract

Majority of farmers in upper Eastern region of Kenya mainly apply chemical fertilizers to boost crop yields. Continuous use of chemical fertilizers causes several adverse effects such as p- fixation, volatilization of essential nutrients and leaching that affects safety of groundwater and agricultural environment. We evaluated the effect of goat manure based vermicompost on soil chemical properties in Chuka University farm, Meru South sub-county and KALRO Embu horticultural field, Manyatta sub-county; December 2018 to March 2019. Experiment was laid out in a Randomized Complete Block Design and replicated three times. Treatments consisted of goat manure based vermicompost applied at five levels (0, 5, 10, 20 and 30 tha -1). NPK 17-17-17 at the recommended rate of 200 kg ha -1 and goat manure (30 t ha -1) were used as control treatments on each black treatments were randomly assigned to experimental plots. Soil sampling and analysis was done on the entire experimental sites before experiment. Soil sampling and analysis was carried out on each experiment block. Results showed that application of goat manure based vermicompost led to statistically significant difference (p < 0.05) on soil chemical properties. Application of 30 t ha -1 goat manure based vermicompost showed significantly (p < 0.05) higher soil pH (8.00), total N (0.606%), available P (21.933ppm) and exchangeable K (0.863[Cmol (+)/kg]) than control treatment. Thus addition of goat manure vermicompost had significant (p < 0.05) positive effects on the soil chemical properties.

Keywords: Goat manure, vermicompost, garlic, soil sampling, soil analysis, soil chemical properties.

Determination of Maize Performance (Growth and Yields) in a Field Infested with Spiral Nematodes (*Scutellonema* spp.)

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Abstract

Maize is a significant food security crop in Kenya serving as a main source of calories among the small-holder farmers. The overall maize yields per hectare have been fluctuating in the past few years posing a great risk to food security. Among the factors associated with maize yield loss include plant feeding nematodes. This study evaluated the impacts of plant parasitic nematodes specifically *Scutellonema* spp. on maize performance under field conditions in Mwea, Kenya. Field trials were laid out in a complete randomized block design with each treatment comprising four replicates. Treatments included maize plots without nematicide (MPWN), and control plots treated with nematicide. Experiments were conducted in two trials i.e. 2018 and 2019. Soil samples were taken at a depth of 0-20 cm at monthly intervals during the trials. During the two trials, MPWN recorded significantly lower plant height and number of leaves per plant. Correlation analysis revealed a significant negative relationship between *Scutellonema* abundance and growth indicators such as leaf area index, plant height and number of functional leaves in MPWN during 2019 trial. This implies that higher population of *Scutellonema* perhaps has the potential to affect leaf area index, plant height and number of leaves per plant; aspects that will consequently influence maize productivity. Therefore, holistic sustainable management practices to control *Scutellonema* spp. in maize fields such as use of organic amendments, resistant maize cultivars and antagonistic organisms are crucial in order to alleviate negative impacts linked to *Scutellonema* infestation.

Keywords: Spiral nematodes.

Population Dynamics and Diversity of Free Living Nematodes in Sweet Potato Under Different Management Practices

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Abstract

Sweet potato (*Ipomoea batatas* L.) is an important food crop consumed throughout Africa. This crop is associated with both plant parasitic and free-living nematodes. While plant parasitic nematodes (PPN) reduce sweet potato productivity, free-living nematodes (FLN) play beneficial roles such as decomposition and nutrient mineralization which are essential in growth and development of the crop. Farmers use various management practices to control PPN which in turn may affect other microorganisms in the soil including the beneficial free-living nematodes. This study evaluated the impact of different farming practices on the population dynamics and diversity of free-living nematodes in sweet potato growing fields in Mwea, Kenya. Field experiments were established in a randomized complete block design involving four treatments and unamended controls during long and short rains (SR) seasons. Soil samples were collected monthly for a period of four months. Nematodes were then extracted and identified to genus level. Thirty two nematode genera belonging to four trophic groups were identified. Bacterivores were the predominant group and fungivores were the least frequent group in the two seasons. All treatments recorded high densities of bacterivorous nematodes compared to the control. Increased abundance of omnivorous and predacious nematodes was observed across the treatments in the two seasons except in the long rains season where omnivores were high in control. Goat manure was the most effective in stimulating population densities of free-living nematodes. This could be attributed to the nutritious food resources available in this amendment. Thus goat manure should be incorporated in sweet potato fields to ensure that populations of free-living nematodes are maintained or enhanced for continuous provision of the key important soil functions.

Keywords: Population dynamics, nematodes, sweet potato, management practices.

Synthesis and Characterization of Nanoparticles from Extracts of Fruits of *Annona Muricata*: A Green Nanobiotechnology Approach

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Abstract

Green synthesis of nanoparticles from plant materials opens a new scope in Nano biotechnology and discourages the use of expensive toxic chemicals. The aim of this study was to develop and optimise a method for synthesis of Silver Nanoparticles (AgNPs) from ethanoic extracts of fruits of *Annona muricata* and to characterise the green synthesized AgNPs. Silver nanoparticles were synthesized using silver nitrate ($AgNO_3$) solution. The particles were characterized using spectroscopy and microscopy. The formed nanoparticles had an absorption maximum of 427 nm and were stable under different temperature, pH and storage conditions. Fourier Transform Infrared Resorption spectroscopy revealed the functional groups responsible for synthesis and stabilization of the nanoparticles. Scanning Electron Microscopy analysis revealed a spherical nature of the AgNPs. Energy Dispersive X-Ray spectroscopy showed presence of Ag, Cl, Ca, and Si with Ag having the highest composition at 80%. X-Ray Diffraction and Dynamic Light Scattering revealed a crystalline nature of AgNPs with an average size of 60.12 nm and a polydispersity index of 0.1235 respectively. Transmission Electron Microscopy analysis further confirmed the crystalline and spherical nature of the AgNPs. **Conclusion:** In this study, an efficient, eco-friendly and low-cost method for the synthesis and recovery of stable AgNPs using ethanolic extracts of *Annona muricata* fruits as both reducing and capping agents has been reported. The synthesized AgNPs could have many biomedical and clinical applications.

Keywords: Annona muricata, silver nanoparticles (AgNPs), UV/VIS, FTIR, XRD, fruit extracts.

Assessment of Wild Rodents Endoparasites in Kirimiri Forest in Embu County, Kenya

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Abstract

Rodents are reservoirs and hosts of zoonotic diseases. Rodents' pathogenic parasites can be introduced in soils, water supplies, vegetables and fruits thus playing significant role in human infection. Though studies on rodents and their parasites are necessary to understand and manage zoonotic disease cycle, knowledge gap of endoparasite composition of wild rodents that interact with domestic animals and humans still exists in Kenya. This study was carried out to determine prevalence of rodents' endoparasites in Kirimiri forest, Embu County in Kenya between January and May 2016. Wild rats were caught by laying traps in 100 m x 100 m grid of 50 Sherman and 50 victor traps. Rodents' morphometric data was used for their identification. Necropsy was performed for gastrointestinal tract (GIT) and endoparasites extracted, counted and prevalence determined. Three species of rats totaling to 355 rats comprising 199 males and 156 females were captured and identified and a total of 533 endoparasites extracted. Rate of endoparasite prevalence was significantly higher in *Rattus spp* a peri-domestic rodent compared to forest rodents' species (χ= 57.791, P = < 0.05). *Asyphalia obvelata* (44.79 %) had higher prevalence while the *H. dinimuta* had lowest prevalence (6.20 %). Prevalence based on forest patches, GIT and was different. The study highlights the importance of rodents as potential vectors for intestinal parasitic infections.

Keywords: Rodents, endoparasites, Kirimiri forest, Kenya.

Soil Concentration of Selected Heavy Metals in Chuka, Nakuru and Thika Municipal Dumpsites

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Abstract

Dumpsite waste pickers face numerous health and safety risk factors one of which is elevated concentration of heavy metals in the soil that could be a source of exposure through dusts. The purpose of this study was to determine the concentration of selected heavy metals (lead, cadmium, chromium and copper) in the top 15 cm of soil. The study was carried out in the largest dumpsites in Tharaka Nithi, Nakuru and Kiambu counties in Chuka, Nakuru and Thika towns, respectively. The study was non-experimental cross-sectional ecological survey, the sampling design a herringbone pattern with 96 soil samples collected with a stainless-steel auger. Laboratory analysis was done by USEPA Method 3050B and concentration determined by Atomic Absorption Spectrophotometer at the Department of Mines and Geology Laboratory in Nairobi. F-test was done for differences between dumpsites at α=.05 and comparison made to WHO guidance values. Significant differences between the dumpsites were detected for lead (F=44.555, p=<.001), copper (F=5.897, p=<.01), cadmium (F=4.739, p=.016) and chromium (F=6.223, p=<.01). The largest percentage of samples with concentrations above the WHO guidelines were Kiambu (97%) for lead and Nakuru with 26.7% for chromium, 66.7% for cadmium and 56.7% for copper. Chuka dumpsite had the highest proportion of samples with the lowest concentration of lead and chromium and with the lowest proportion of samples where cadmium was detected. In conclusion, Nakuru and Kiambu dumpsites were highly polluted and were a huge risk factor to the waste pickers. In the short-term, it is recommended that waste pickers should wear adequate health and safety protective equipment while on site and possibly reduce the time at the dumpsite to minimize exposure. In the long-term, waste separation should be done to ensure that heavy metal containing waste do not get to the dumpsites, waste recovery facilities adopted to minimize waste picking at dumpsites and improve recycling, and the dumpsites upgraded to sanitary landfill status.

Keywords: Heavy metals, waste pickers, waste management, dumpsite, electronic waste.

Invitro Efficacy of Different Warburgia Ugandensis Organic Crude Extracts Against Tomato Phytophthora Infestans and Alternaria Solani

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Abstract

Alternaria solani and *Phytophthora infestans* are causative agents of early and late blight of tomatoes respectively and are currently controlled using fungicides. Use of inorganic chemicals is increasingly being discouraged due to safety challenges to consumers, pathogens resistance, environmental pollution and accumulation of residues in plants. Tomato production plays a vital role in meeting domestic and nutritional food requirements, generation of income, foreign exchange earnings and creation of employment. This study investigated the invitro efficacy of Warburgia organic solvent crude extracts on blight pathogens. *Warburgia ugandensis* stem bark sample was air dried at room temperature then ground. Powdered material was weighed and soaked in organic solvent then filtered and the solvent recovered using a rotary evaporator. Multiple extraction method was used with four organic solvents. Well diffusion method was used to screen Warburgia extracts against *A. solani* and *P. infestans*. All assays were performed in triplicate. Statistical analysis on inhibition zone was carried out using analysis of variance (ANOVA). *Warburgia ugandensis* hexane crude extract had the highest inhibition zone in *A. solani* while methanol crude extract gave the highest mean inhibition zone in *P. infestans*. All extracts were inhibitive against *P. infestans* and *A. solani*. Further research is required on invivo studies and analysis of bioactive compounds in the extracts.

Keywords: Alternaria solani, invitro inhibition, phytophthora infestans, tomatoes, warburgia ugandensis, well diffusion method.

An Analysis of Socioeconomic Factors Affecting Avocado Production Around Lake Victoria Basin of Kenya with Special Emphasis on Flooding and Its Implications

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Abstract

Climate change due to global warming has become a major bearing on agricultural. This has been associated with rising temperature, droughts, flooding and intense winds. In sub-Saharan Africa these impacts have become increasingly devastating to Agriculture and food security. With increasing magnitude and frequency. Avocado (*Persia americana*) is an important world crop due to its nutritional and health importance. In Kenya, its production is limited by flooding among other factors. Studies were conducted in the Lake Victoria Basin Counties of Busia (Bunyala), Muhoroni, Nyando and Rachuonyo to investigate flooding, human capital, gender, age and farmer education on Avocado production. Questionnaires, focus group discussions, key informants interviews and desktop reviews were used to collect data. Analysis was done using Statistical Package for Social Scientists. Frequencies and percentages were interpreted and reported in this paper. Results showed that human capital affected input purchase, rootstock selection, establishment, harvesting and marketing. While flooding led to root diseases (*Phytophthora cinnamon*). In all aspects human capital, farmer education, extension services contributed to farmer's abilities to adopt new technologies for increased crop productivity.

Keywords: Flooding capital, economic, strategies, climate change, avocado, Lake Victoria, Kenya.

Use of Heat Units to Predict the Optimum Transplanting Stage of Baby Corn (Zea Mays L.) Seedlings Under Field Conditions in Meru County, Kenya

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Abstract

Baby corn (Zea mays L.) is a type of maize belonging to the Poaceae family of plants. It is grown as a vegetable in a wide range of Agro-ecological zones in Kenya. The plant is mainly grown for its immature unfertilized ears harvested within 2 to 3 days after silk emergence. However, due to continued demand for water, rainfall unreliability and the need for accelerated maturity, transplanting has to be adopted as an intervention of choice with good outcomes. The optimum transplanting stage is influenced mainly by the altitude (area temperature) of the locality due to difference in plants growth rate hence a universal transplanting stage parameter of heat units was used to establish the correct stage. The experiment was conducted under field conditions to determine the best transplanting age of baby corn seedlings. It involved two Baby corn varieties namely Thai-gold and Pan-14 which were raised in potted sleeves in a nursery and later transplanted at different stages to establish the effect of transplanting stage on their performance. Transplanting was done at 200, 300 and 400 GDD apart from the directly planted Babycorn at 0GDD. Data on GDD, maturity height and yield parameters were collected and subjected to analysis of variance (ANOVA) using a normal excel programme as well as SAS version-20. The means were considered different if the p-value was less or equal to 0.05($p \leq 0.05$). In both varieties, results showed that baby corn plants transplanted at 200 GDD had higher flowering height (MH), fewer maturity GDD, longer cob length, larger cob diameter and more marketable cobs per plant.

Keywords: Growing degree days, maturity height, PAN 14, TH- Thai GOLD, field condition and green house.

Incidence and Severity of Turcicum Leaf Blight Caused by Exserohilum Turcicum (pass.) Leonard and Suggs) on Sorghum Populations in Different Regions of Tharaka Nithi County, Kenya.

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Abstract

Sorghum [*Sorghum bicolor* (L.) Moench] is a drought tolerant food crop preferred by subsistence farmers in dry areas which experience low annual rainfall. However, Turcicum Leaf Blight (TLB) caused by *Exserohilum turcicum* has threatened sorghum production in the world. New sorghum varieties have been introduced into the Kenyan production systems, including the drier parts of Tharaka Nithi County to boost yield and thus meet the increased demands for food and as a raw material by brewing industries. Nonetheless, challenges due to infection by TLB have negatively impacted on sorghum production resulting from damaged photosynthetic leaves. This study was conducted to determine the incidence and severity of TLB on sorghum populations in different regions of Tharaka Nithi County. Sorghum farms in eleven villages for the study were selected by multistage random sampling. The study was conducted between the month of January and June 2018. Data analysis was done by SAS software version 9.4 and significantly different means separated using LSD test at 5% probability level. There was statistically significant difference in the severity and incidence of *E. Turcicum* leaf blight on sorghum population from different regions in Tharaka Nithi County ($P<0.05$). Disease TLB occurred in all the villages surveyed though at different frequencies. The disease incidence was higher at Kithaga, and Nkairini recording 74.45% and 55.93%. and lowest at Gatuntu and Gituntu both recorded the disease incidences 12.22%. Thus, farmers should be educated on sorghum TLB management for increased sorghum production and higher income to farmers.

Keywords Incidence, severity, TLB, sorghum, Tharaka-Nithi, Kenya

Municipal Waste Disposal and Management for Environmental Sustainability

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Abstract

Municipal Waste is a contemporary environmental challenge globally. Municipal Waste is a major contributor to air, water, land and soil pollution. Therefore, there is great need to create mechanisms necessary to deal with waste management problems holistically. The concept of municipal waste has various perspectives namely, the socio-economic dimension due to wastefulness and pollution and the environmental dimension. The general objective was to identify practical ways of handling municipal waste disposal and management for environmental sustainability and the specific objectives were to highlight practical ways of minimizing water, air, soil and land pollution; to identify safe means of waste water treatment; to address capacity development expertise gaps in municipal waste disposal and management and to assess the effectiveness of municipal solid waste disposal and management. This researcher employed descriptive survey design. Descriptive research design was concerned with describing the characteristics of a particular group where target population in this study comprised of 500 that constituted 250 residents within Wote Municipality and 250 residents in the peri-urban centers. 30% revealed that burning of municipal wastes produced toxic carcinogens; 70% resold their e- waste and scrap metal to local dealers who reprocessed the wastes to extract e-waste and scrap metal raw materials. 60% burnt sharp objects and vehicle lubricants but this exposed them to respiratory diseases and carcinogenic substances. 40% constituted of paper, chemical packaging and insecticides. This has necessitated eco-friendly waste disposal.

Key words: Environmental sustainability, pollution, waste.

SUB-THEME: TRANSFORMING ECONOMIES THROUGH ENGINEERING, SCIENCE AND TECHNOLOGY

Bridging Digital Learning Divide by Mobile Ad Hoc Networks (Manets): A Model

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Abstract

Mobile Ad hoc Networks (MANETs) are made up of mobile nodes that are interconnected wirelessly. Their topology changes as mobile nodes join and leave the network. MANETs do not depend on fixed infrastructure. Due to their dynamism and low cost—no infrastructure needed, this paper proposes a MANETs-based model that can be used as a solution to inequitable education, particularly in marginalized areas such as the slums. This study is an extension of previous research that established the dynamism and supplementary nature of routing protocols in MANETs. By deploying Zone Routing Protocol (ZRP) and combined-metric based clustering of routing zones, it is possible to take advantage of both proactive and reactive routing protocols in designing a MANET network useful in distribution of learning resources between well-resourced learning institutions and the under-resourced learning institutions. This study proposes deployment of MANETs network in creation of virtual classrooms to bring about increased sharing of learning resources, to advancing learning.

Keywords: Mobile ad-Hoc networks (MANET), zone routing protocol (ZRP), clusters, intrazonal routing protocol (IARP), interzonal routing protocol (IERP), cluster head (CH), cluster gateway.

In-door Air Pollution from Traditional Cook Stoves and Hindrances Towards Uptake of Clean and Improved Stoves: A Review

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Abstract

A large proportion of the rural population (around 3 billion) in the world cook using solid fuels on traditional and inefficient fires. The use of traditional cook stoves has been associated with high levels of pollutants such as particulate matter and other greenhouse gas emissions. These pollutants have led to an increase in respiratory infections such as childhood pneumonia, chronic obstructive pulmonary diseases, cardiovascular diseases and lung cancers leading to an estimated 4.3 million deaths in 2012. A lot of effort has been directed towards designing, manufacturing and distribution of improved cook stoves to mitigate these effects but the output is wanting to date. This paper brings to the fore the cost, usage and pollutant emissions from predominant cooking stoves in rural areas and highlights the hindrances to adoption of new cooking stoves. Data collected using semi-structured questionnaires, laboratory experiments and field practicals. Women and children were most affected by the in-door air pollution since they spent a considerable time cooking. CO levels near the fire exceeded WHO guidelines by 0. 79ppm. The average PM2.5 concentration measured during cooking was 400 times the air quality guidelines (AQG) value, also exceeding the WHO Interim target 1 set at 0.23 mg/m per minute for unvented stoves. Firewood collectors spent on average 22 hours per month collecting solid fuels. This has a tremendous effect time available to most school- going children. Relatively inexpensive stoves had limited long term impacts. The stoves reduced smoke exposure for the primary cook in the household in the first year of the study, but after normal use they subsequently had no discernible effect on exposure. The declining effect appears to be the result of stove breakages combined with insufficient investments in maintenance, reductions in the number of meals cooked with clean stoves in good condition and inappropriate cleaning and use. Barriers to alternative clean stove models achieving widespread market penetration and usage were identified as lack of awareness of the health impacts of improved stoves, high cost of the stoves and willingness to pay. Thus, for a clean stove to achieve widespread market success, it must be cheap to produce and transport to remote areas and also have a low marginal cost to use, clean, and maintain. Carbon credits could in principle help with the low willingness to pay for the stoves.

Keywords: Air pollution, improved cook stoves, hindrances, market penetration.

Optimizing Structure and Mechanical Properties of Al-Mg Alloys

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Abstract

Aluminium-Magnesium (Al-Mg) alloys possess a combination of unique properties such as good mechanical strength, ductility and excellent corrosion resistance. Recent developments in optimizing the intermetallic phases, consolidating dispersoids in the structure continue to be the center of focus. However, a gap still exists on the cost-effective methods to enhance mechanical and corrosion properties of alloy system. This study focused on optimizing the structure, texture and mechanical properties of the Al-Mg alloys through optimization of phase compositions using additive elements, hardness, and the application of heat treatment and annealing cycles. The study also investigated the role of trace elements during casting, homogenization and annealing in modification of the microstructures. The pure 99,9wt. % Al, 99,9wt. % Mg and master alloys with trace elements such as Zr, Cr, Mn and Ti were used. The experimental alloys were investigated using SEM, EBSD, XRD, and TEM after strain hardening and homogenization. Three experimental alloys of Al-Mg system: Al-6.4Mg- 0.4Mn-0.2Zr, Al-5.4Mg-0.6Mn-0.3Zr and Al-5.1Mg-0.45Mn-0.2Zr-0.25Cr-0.05Ti were prepared and investigated. The measured average values for ultimate tensile strength (UTS) and yield strength (YS) were 445 Mpa and 438.3 Mpa respectively with the average elongation of 6 %. The hardness of the alloys increased at beginning then decreased with homogenization time.

Keywords: Homogenization, hardness, phase composition and microstructure.

Phosphorus Availability and Exchangeable Aluminium Response to Phosphate Rock and Organic Inputs in the Central Highlands of Kenya

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Abstract

Soil acidity and phosphorus deficiency are some of the constraints impeding agricultural production in the tropical regions. Prevalence of acidity is associated with phosphorus (P) insufficiency and aluminium saturation. We conducted a two seasons experiment to investigate the effects of phosphate rock and organic inputs in acidic soils of Meru South Sub-County, Kenya using a randomised complete block design with treatments replicated thrice. Treatments were; *Tithonia diversifolia*, Phosphate rock, manure, *Tithonia diversifolia* combined with phosphate rock, manure combined with phosphate rock, Triple superphosphate combined with Calcium ammonium nitrate (TSP+CAN) and a Control (no input). Treatment under *Tithonia diversifolia* significantly (p=0.0016) reduced exchangeable aluminium. The TSP + CAN and manure recorded significantly high values of available P (Brays' 2 P) compared to the control. The TSP + CAN, manure and *Tithonia diversifolia* + phosphate rock increased bicarbonate total phosphorus (Bic-PT) by 15, 44 and 94%, respectively, during the short rains season of 2017, compared to the control. The phosphate rock treatment significantly (p=0.0006) increased bicarbonate inorganic phosphorus (Bic-Pi) by 43.4% compared to the control. Treatments under *Tithonia diversifolia* + phosphate rock (PR), TSP + CAN and manure + phosphate rock significantly (p=0.01) increased the moderately total labile P outperforming the control by 38.4%, 30% and 20.6%, respectively. At the end of the experiment, *Tithonia diversifolia* + phosphate rock, increased the occluded inorganic P by 3.3-fold compared with the control. The P associated with calcium (HCl-Pi) was significantly higher under manure + phosphate rock treatment with a 2-fold P increase above the control. Treatments under *Tithonia diversifolia* recorded significantly higher residual phosphorus. These findings underscore an integrated approach utilizing organic amendments combined with phosphate rock in the phosphorus nutrient management of acidic *humic nitisols*

Keywords: Occluded phosphorus, labile inorganic phosphorus, agro-ecological zones, humic nitisols.

Effect of Cell Composition on Internal Resistance on Open Circuit Voltage and Short Current Density of a Fabricated Titanium Dioxide Cell

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Abstract

This paper reports on development of solar energy by titanium dioxide solar cell. Optimization of the material involved was carried out and the final cell constructed using the ratios that provided the highest current-voltage outputs. The study also investigated the effect of the thickness of TiO_2 (the photo active layer) and electronegative material layers on current-voltage output of the fabricated solar cell. The optimum electricity generation in the ratio of TiO_2/ C_x: I_2: KI as 0.4: 0.3: 0.17: 0.01 g respectively. The e open circuit voltage (V_{OC}) and short circuit current density were (J_{SC}) of 0.083 V and 0.33μA respectively. However, despite the obtained values being low, there is potential application of this type of cell. It is recommended that improved technologies be employed to reduce the presence of air pockets which creates air gaps that resistance to migration of electrons.

Keywords: Cell composition, internal resistance, $V_{OC,}$ J_{SC}.

Outdoor Position Sensing Using Gps and Active Rfid Beacons.

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Abstract

This paper presents an outdoor positioning system based on Global Positioning System(GPS) and Radio Frequency identification (RFID) that can be used for tracking and pursuit. GPS is mainly used to provide location by acquiring signals from 24 satellites and using triangulation to provide accurate location data. It however has limitations since it is affected by weather. In the system developed here, RFID has been used as a complement system to provide a more reliable means of positioning sensing by using the concept of reference tags. The main advantage of this system is the increased accuracy in positioning.

It also has key advantages over other position estimation techniques in that it doesn't require contact or -line-of-sight for operation. The system was tested and the results presented here show that a combination of GPS and RFID provide accurate and affordable means of positioning.

Keywords: Localization, outdoor positioning, position sensing, RFID.

The Response of Kenya's Construction Industry Output Growth Rate to Central Bank Base Lending Interest Rate (2007 – 2018)

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Abstract

Globally, construction industry is viewed as one of the major industries in a country's economy. Thus, knowledge of the impact that central bank rate bears on the industry shall make management of the industry by the government less challenging and enhance its steady growth and contribution to the gross domestic product in Kenya. This paper is presenting empirical findings indicating how central bank rate (CBR) impacts on construction output growth rate, and how this influences the related policy design and formulation. Time series data analysis method was used to analyze data collected from Kenya National Bureau of Statistics and Central Bank of Kenya. This data covered a period of twelve (12) years from 2007 to 2018. EViews version 7; a statistical software was used for data analysis. Statistical outputs generated graphical analysis, correlation analysis, tests of stationarity and regression analysis. Dependent variable (construction output growth rate) was regressed on the independent variable (CBR); applying the second differences of both CBR and construction output growth rate. Results indicated that CBR had no significant influence on the growth of construction industry in Kenya. A model explaining this outcome was developed which has a coefficient of determination (R2) of 0.08. However, it was observed that these impacts are felt much later after the CBR implementation as demonstrated by a regression model of lagged interest rates which showed R2 value of 0.998. This figure is an indicator that the regression model of lagged CBR has strong explanatory powers and thus it was logical to conclude that (CBR) has an impact on construction industry output growth rate in Kenya. CBR can thus be adopted for policy formulation for purposes of regulating the construction industry in Kenya.

Keywords: Construction output, time series, stationarity, explanatory power.

Load Optimization Through Scale Level Monitoring and Real Time Response: A Case Study of Olkaria II

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Abstract

Kenya targets industrialization status by the year 2030 which needs reliable and adequate source of energy. Previously, half of the electricity supply in Kenya was met by hydropower but demand for Country's house hold energy mainly wood and charcoal put pressure on Country's forest cover, reducing it to 3% of the total land and this has severely affected electrical hydropower potential. Geothermal power is thus preferred as it offers dependable, reduced green gas emissions, meet diversification needs and provides least cost base load mode of energy generation. However, exploitation of this resource is face with challenges of scale formation on the steam lines and most surface equipment, leading to reduced and expensive production. To benefit effectively from geothermal resources, careful management of steam field is crucial to ensure that the resources are not depleted and that hazardous chemicals are properly managed using effective maintenance strategies. However, the practice in most geothermal fields is, waiting for scales buildup, 'manually' monitoring the change in parameters until production reduces to prompt removal. Dependency on human intervention to determine when 'enough scales' have formed so that they can be removed, is unreliable, costly and has led to plant shut down and in some cases, complete abandoning of wells due to clogging. This study determines how changes in geothermal parameters due to scaling can be used to quantify energy losses. Purposive sampling will be used to collect data from Production Data Sheets of Unit 1 of Olkaria II for the period 1 Nov 2018-19th Jan 2019, when scales had formed and for the period 28th Feb -14th March 2019 after the scales were removed for information comparison. Data collected will be analyzed using MATLAB software version R2017 to come up with a model that will help determine significant parameters associated with reduced production due to scaling. The model can be used to reliably come up with an automated monitoring and scale formation detection system in the geothermal system, that will prompt cleaning at the 'right' time to improve efficiency of production and reduce wastages.

Keywords: Load optimization, monitoring, real time response, Olkaria II.

Improving Image Recognition Capacity in Convolution Neural Networks

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Abstract

Creating accurate Machine Learning models capable of identifying and localizing multiple objects in a single image remained a core challenge in computer vision. But, with recent advancements in Deep Learning, Object Detection applications are easier to develop than ever before. Deep neural networks and deep learning have become popular in past few years, thanks to the breakthroughs in research, starting from AlexNet, VGG, Google Net, and ResNet. Recently, ResNet, was reported to greatly improve the performance of large-scale image recognition and helped increase the popularity of deep neural networks. This paper reports the results of an empirical study of methods and techniques for improving the capacity of Convolution Neural Networks to solve an image recognition problem. From the results, it was noted that optimization techniques greatly improve the performance of Convolution Neural Networks for image processing tasks. The performance measures employed in the study included Mean Squared Error Accuracy as well as convergence rate.

Keywords: Deep neural networks, image analysis, computer vision, image recognition, convolution neural networks, deep machine learning.

Smart Contract for Class Attendance Management

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Abstract

Block chain is a distributed ledger technology that records exchange of value between parties securely, permanently and in a verifiable manner. Although initially used for financial transactions, block chain applications are currently being implemented across various fields including education. They are typically used to store records of digital agreements (smart contracts) between transacting parties that are written in computer code and deployed on the block chain, where they self-execute when certain conditions are met.

The goal of this study is to design a smart contract application for class attendance management by tracking and validating student and faculty attendance through sanctioning student's course credits and faculty's salary according to the hours recorded in the system. A design framework is created and validated to solve the problems of traditional centralized class attendance record keeping systems.

Keywords: Smart, contract, class, attendance management.

Effects of Liberalization of Airwaves on Media Indigenization, Entrepreneurship and Innovation in Kenya

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Abstract

Since independence, Kenya media airwaves were monopolized by KBC, a fully state-run/owned radio and TV media outfit. A few foreign stations which were highly controlled and strictly monitored by government were allowed to broadcast. In the late 1980s and early 1990s, the Kenyan airwaves experienced liberalization as multi- party politics gained ground. Since then, the Kenyan media has experienced exponential growth since the airwaves were liberalized and freed. consequently, liberalization and indigenization have grown full circle. The internet has also contributed greatly to the expansion of media space and freedom. This study seeks to determine the effect of liberation of airwaves on indigenization of the Kenyan media and its overall effect on entrepreneurship and innovation in Kenya. It investigates the nature and characteristics of the indigenization process of the Kenyan media, the extent of indigenization, challenges of indigenized media as well as shortcomings and proposes a way forward in order to achieve strategic indigenization in order to grow entrepreneurship and innovation. Data was collected for a period of one year between 2018-2019 from private and public owned media houses on print and broadcast media. Library and archival research were applied in data collection. Observation of traditional and modern media trends was made while content analysis was applied to determine nature, characteristics and extent of indigenization and effects of a liberalized media in relation to indigenization, entrepreneurship and innovation. The theory of press freedom and liberalism was used to account for effects of liberalization on indigenization. Social responsibility theory was applied to explain the challenges of a liberalized media while Entrepreneurship theories were applied to account for entrepreneurial issues. The paper observes that despite the challenges faced in a liberalized media space such as unethical conduct, loss of gatekeeping, lack of professionalism, proliferation of radio stations, liberalization of airwaves has

impacted positively to the rise of entrepreneural ventures in the media industry in Kenya and has largely promoted creativity and innovation. Generally, it has revolutionized the media sector at large. The paper proposes a way forward to an even greater expanded media that promotes entrepreneurship, professionalism and ethical journalism.

Keywords: Liberalization, indigenization, entrepreneurship, innovation, airwaves.

Home Gateway Solution to Secure and Reliable Patient Monitoring in a Medical Network

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Abstract

In this paper analysis has been done on challenges to medical equipment networks and home patient monitoring using medical sensor networks. A possible solution is proposed and tested for implementation in the Kenya scenario. The rationale for this unique network is due to the fact that existing networks for conventional data used in business enterprises do not meet requirements which include equipment stability, redundancy, data transmission guarantee, automatic defense security, high speed link and centralized fault tolerance. Emphasized is a home extension gateway that transparently links medical sensors and imaging equipment at patients home or health centre to major medical resources as specialized equipment, databases and medical personnel. Target traffic for the network are biomedical signals and image streaming. Transport layer uses MINISIP set of protocols and network layer Open VPN which offers secure tunneling, virtual network interfaces and bridging as well as NAT and DNS forwarding. All possible internet connections are explored and implementation possibilities identified. Some security features implemented for interoperability include IP Tables and Easy IDS. Reliability was met by Quality of service with bandwidth guarantee by use of WDM on a 10Gb backbone fibre cable, multi-homing and virtualization of gateway. Various test beds were used to test security, reliability and network availability. When Bifrost operating system, which is a networking Linux distribution was used it resulted in successful deployment the Home extension gateway. Possibility of implementing the network in Kenya is explored and various possibilities are reported.

Keywords: Security, reliability, open VPN, tunneling, home gateway, medical sensor network.

Bayesian and Frequentist Approach to Time Series Forecasting with Application to Kenya's GDP Per Capita.

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Abstract

Real GDP per capita is an important indicator of a country's or regional economic activity and is often used by decision makers in the development of economic policies. Expectations about future GDP per capita can be a primary determinant of investments, employment, wages, profits and stock market activities. This study employed both the frequentist and the Bayesian approaches to Kenya's GDP per capita time series data for the period between 1980-2017 as obtained from the World Bank data portal. The autoregressive integrated moving average (ARIMA) and the state space models were fitted. Results of this study showed that the local linear trend model and the ARIMA(1,2,1) model are appropriate for forecasting the GDP per capita but the former outperforms the latter. The local linear trend model was used to perform a 3-step ahead forecast and the forecasted value was found to be U.S $ 1717.694, U.S $ 1844.446 and U.S $ 1971.198 for 2018, 2019 and 2020 respectively. The findings of this study showed that the state space models, which utilize the Bayesian approach, outperform the ARIMA models which use the frequentist approach in time series forecasting.

Keywords: ARIMA model, state space model, kalman filter, kalman smoother, GDP per capita, forecast.

Preliminary Assessment of Ecological Impacts of Transportation Infrastructure Development: A Reconnaissance Study of the Standard Gauge Railway in Kenya

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Abstract

Transportation infrastructure play key role in movement of goods and services within and between countries, contributing to economic and social growth. Kenya, with support from the Chinese government, is currently constructing a standard gauge railway (SGR) to support the country's Vision 2030 development agenda. Although the actual land area affected by the SGR cover only a small proportion along the corridor, a significant proportion of the area supports ecologically fragile and important ecosystems in the country. The aim of this paper was to broadly identify the actual ecological impacts of the SGR *vis à vis* the perceptions of stakeholders and to support ecologically sensitive design of linear infrastructure. Qualitative data was collected through 24 group interviews and meetings comprising over 40 key informants in 14 sites along the Mombasa to Narok sector of the SGR. Qualitative content analysis methods using the Qualitative Data Analysis Miner Lite (QDA) software were applied to code and categorize qualitative data. ArcGIS 10.4 was used to spatially map the SGR, key ecosystems and protected areas. Four dominant themes emerged: 1) ecosystem degradation; 2) ecosystem fragmentation; 3) ecosystem destruction; and 4) impacts of climate change. Ecosystem degradation was the most commonly cited impact while ecosystem destruction was of the least concern. Climate change issues mainly related to current shifts in climatic conditions, loss of forest cover and drying up of rivers and streams and concerns about their future changes. Our results show that the SGR affected key ecosystems in the country and noted the asynchrony between impact mitigation, construction and operations, and stakeholder views. The paper presents a conceptual model that highlights how ecologically sensitive project design and implementation can be better undertaken for mega linear infrastructure. Therefore, we recommend that project proponents develop sustainable and ecologically sensitive measures to mitigate the impacts.

Keywords: Ecological impacts, transportation, infrastructure standard gauge railway, Kenya.

Solar Radiation Prediction Models Analysis for Varying Climatic Conditions

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Abstract

Solar radiation is a renewable source of energy that is readily available in the tropics almost throughout the year. Efficiency of solar energy technologies in food preservation depends on accurate prediction of irradiation, design and sizing of solar technology. This study investigated global solar predictive models, modified, validated and compared five models, for prediction of monthly daily mean solar radiation in four different locations in Kenya representing four major climatic conditions. The input variables to the models were; latitude, day length, sunshine hours, relative sunshine hours, temperature, and precipitation. Solar radiation data from 2000 to 2014 was used to obtain the monthly daily mean global solar radiation, to analyze, validate and compare performance of the models. Predicted and measured data was simulated using MATLAB. Statistical indicators, MBE, RMSE, t-test and R, were performed to determine the model's performance. Results showed that sunshine hours-based models predicted global solar radiation with higher accuracy in wet and cold, wet and warm climatic conditions, while the temperature and precipitation models were accurate in solar radiation prediction in hot and dry climatic conditions. Different solar predicting models should be applied in varying climatic regions, for accurate prediction of solar irradiation and in designing of efficient solar energy technologies for specific sites.

Keywords: Global solar radiation, sunshine hours, day length, irradiation, solar technology.

Precision of 3-Configurations with Respective Sub-Configurations of 2-Ring Concentric Planar Array in Direction Finding

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Abstract

Direction finding is a key area of sensor array processing which is encountered in a broad range of important engineering applications. These applications include wireless communication, radar, sonar, among others. This work compares the estimation accuracy of 3-configurations (based on the inner radius variation and constant outer radius) of a 2-ring concentric planar array that is uniform in direction finding via the Cram´er-Rao bound derivation and analysis. The 3-configurations' estimation accuracy is articulated to their respective sub-configurations based on the sensors distribution in each ring. The sub-configurations use equal overall number of sensors but with 60% - 40% distribution, 50% - 50% distribution and 40% - 60% distribution on the inner-outer rings respectively. Results showed that, estimation accuracy increases as the inner radius approaches the outer radius and thus configuration three has the best precision in direction finding. Furthermore, based on the aforementioned sub-configurations, configuration three is again found to have the best estimation accuracy. These findings would help direction finders such as engineers to economically utilize a given number of sensors.

Keywords: Array signal processing, direction finding, planar concentric arrays, circular arrays, estimation accuracy, parameter estimation, cramer-rao bound.

Crystallization Kinetics of In Se Bi Thin Films for Phase Change Memory (Pram) Applications

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Abstract

Chalcogenide phase change memory is a potential replacement to flash memory due to its excellent properties such as high storage density, rapid phase transition and archival stability. Phase change non-volatile semiconductor memory technology is based on an electrically initiated, reversible rapid amorphous-to-crystalline phase change process in multicomponent chalcogenide alloy materials similar to those used in rewritable optical disks. For over a decade $Ge_2Sb_2Te_5$ (GST) compound has been used in fabrication of phase change memory devices. However, the material has drawbacks such as low crystallization temperature that reduces its ability to retain data at high temperatures and low crystalline resistance which increases the reset current of phase change memory devices. There is need for new materials which will overcome these drawbacks. In this study, a systematic investigation of crystallization kinetics and structural properties of In Se Bi alloys was done. Crystallization kinetics of different In-Se-Bi alloys was done using Kissinger's analysis. Bulk samples of In_2Se_3: x% Bi were prepared by melt quenching technique. Constituents of bulk samples were analyzed using Scanning electron microscope (SEM) with EDS attachment operated at 20KV. Amorphous nature of alloys was confirmed by absence of prominent peaks in the X-ray diffratograms. Thermal properties of the alloy were studied using thermal gravimetric analysis (TGA) combined with differential scanning calorimetry (DSC). TGA runs were taken at five different heating rates of 5, 10, 15, 20 and 25K/min. For each run, approximately 20mg of the sample was loaded on the aluminum pan in dry nitrogen environment at a flow rate of 200Ml per minute under isothermal conditions. Two characteristic peaks corresponding to glass transition temperature (T_g) and glass crystallization temperature (T_c) were obtained. Thermal evaporation was used to deposit In-Se-Bi thin films and full study of electrical, optical and structural properties was done. Thin films were deposited by pulsed layer deposition technique. The phase was determined by X-ray Diffraction (XRD). Electrical measurements at room temperature and upon annealing was carried out by two-point probe method using Keithly 2400 source meter interfaced with computer using lab-view software. Elemental mapping conducted on the as deposited and annealed thin film samples using Scanning electron microscope (SEM) equipped with energy dispersive X-ray spectrometer (EDAX)revealed nonhomogeneous distribution spherical particles.

Optical band-gap was extrapolated from the Ultraviolet Visible Spectroscopy (UV-VIS) reflectance spectrum using Kubelka-Munk equation and widening of the optical band-gap for the doped samples as compared to un-doped sample was observed. PL of In2Se3;X% Bi was studied using a 325nm He-Cd laser line. X-ray photoelectron spectroscopy exhibited that the dopant was present in the doped samples and this was confirmed from EDS results.

Keywords: Crystallization kinetics, In Se Bi, memory (pram) applications.

A Review on Combating Insurance Fraud with Forensic Science

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Abstract

A simple grounding fact is that fraud ensues whenever an opposite opportunity presents itself. Insurance fraud has thus since taken root in Kenya since the commencement and transformation of insurance as a commercial enterprise. Insurance fraud is a malevolent act that is robbing away most, if not all insurance companies of their hard earned returns, and with the advancement of technology, fraudsters are continually modifying and perfecting their schemes to evade detection by the basic scrutiny and approaches. Insurance companies now ought to turn to forensic science for a tool to uncover and resolve fraudulent insurance claims due to widespread recognition that traditional approaches to combat the act are inadequate. Studies of insurance fraud have typically focused on identification of characteristics of fraudsters, fraudulent claims and claimants, and this focus is ostensible in the current wave of forensic and data-mining technologies for fraud detection. It is therefore preferable to engage in an alternative approach of understanding and then optimizing existing practices in detection of fraud, and blending them with the global emerging traits of fraud detection. Insurance fraud involves deceiving the insurer, for monetary gain. Types of insurance fraud are diverse, and occur in all areas of insurance and can be divided into two major categories namely; Fraud by an insurance agent, an insurance employee or someone posing as an authorized representative of an insurance company or agent and; Fraud by individuals, policyholders, medical providers or other service providers against the insurance company by filing false claims or inflating a legitimate claim. Notably is that some classes of insurance are more susceptible to fraud than others.

The auto mobile insurance, healthcare insurance and, workers compensation insurance are believed to be the most affected sectors.

Keywords: Combating insurance, fraud, forensic science.

The Influence of ICT Policies on ICT Innovation

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Abstract

Technology has a huge potential to positively affect the lives of people and foster economic growth as well as, and many opportunities created to individuals, companies and nations across the globe. The potential of information and communication technologies to transform the global society according to the Global Information Technology (GITR) is incredible. Investment by Government and private sectors is necessary in order to stimulate investment and innovation in the sector to ensure that there is Universal access according to COMESA model. In line with Kenya's Vision 2030, the government recognizes that science, technology and Innovation (ST&I) is a main pillar to achieving social-economic and political development. The study focused on how software innovations are affected by innovation policies and government regulations. It also considered other Industry and economic factors influencing ICT innovations. Linear regression Model was used to establish relationship between variables. A greater number of respondents agreed that economic factors influence innovation of software's. Mainly the cost of the software developed as forces of demand and supply drive the market of product. It was concluded that ICT regulations, ICT innovations policies and economic factors had a significant impact on the innovation of ICT products and that Government regulation of ICT sector is of uttermost importance for it protects the rights of players in the market, the environment as well as holding players accountable.

Keywords: ICT policies, innovation.

On Properties of Hilbert Space Operators and Applications

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Abstract

A lot of studies in operator theory are useful in applications to other disciplines like engineering and medical sciences among others. One such study is characterization of properties of operators on Hilbert spaces. A lot of useful results have been obtained on norms of normal operators. However, characterization of normality and norm-attainability of these operators have not been exhausted. We outline the theory of normal, self-adjoint and norm-attainable operators. This study sought to investigate the conditions for norm-attainability of self-adjoint operators; and orthogonality of self-adjoint norm-attainable normal operators. The methodology involved use of inner products, tensor products and some known mathematical inequalities like Cauchy-Schwarz inequality, parallelogram identity and the triangle inequality. Results showed a strong relationship between normal operators and norm-attainable operators' i.e. normal operators are norm-attainable if they are self-adjoint. These results are useful in generating quantum bits and estimation of ground state energies of various molecules like ethane in quantum theory.

Keywords: Hilbert space, normality, norm-attainability, self-adjoint operators, orthogonality.

Monitoring Surface Water Demand, Availability and Spatio-Temporal Variability in Tana River Basin

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Abstract

Growing population, changing land use practices and increasing urbanization have escalated demand for surface and ground water. This has affected availability of water resources in the vast Tana River basin, the largest river basin in the country with many watersheds spanning diverse agro ecological areas. Rainfall shortage and drought experienced in many parts of the basin has impacted on water

resources quality and quantity across the many watersheds within Tana River basin. Moreover, these activities have resulted into serious water abstraction, allocation and use challenges especially at watershed level. It is thence important to manage water demand amidst growing water uses competing needs. To understand how this can be achieved, this study will explore the contribution of various water budget components towards the basin's water demand and availability. Specifically, the study will analyse the input of precipitation, evapotranspiration, discharge, run-off and base flow to the overall water budget within the Tana River Bain.

Keywords: Watershed, drought, Tana river basin, water demand, availability.

SUB-THEME: TEXTILE TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT

Design Aspects for Smart Maternity Wear: A Strategy for a Healthy and Fashionable Pregnancy.

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Abstract

During pregnancy, expectant women experience dramatic physical body changes in terms of body silhouette, measurement, weight and posture. This lead to the need of clothes that can accommodate the changes and make the expectant women attractive and comfortable. Most expectant women have experience in dressing their non-pregnant body due to the availability of many styles and cuts of their normal clothing. Expectant women do realize that the maternity market in Kenya is limited in terms of the styles and cuts it offers. In addition, the maternity wear available in the market is expensive and only used during the last two trimesters. This makes expectant women opt to use the non-pregnant clothes which are ill fitting and uncomfortable to the fetus and the mother thus not buying the available maternity wear in the market. This study aims at determining the design aspects for smart maternity wear which is a solution to the unlimited styles and cuts available in the market. It explores the possibility of using design aspects like garment silhouette, control of fullness and fabric that stretches to accommodate the physical changes. The methodology used was first undertaking a survey that established the desired design aspects of the target respondents, developing the smart maternity

wear and collecting feedback from the target respondent concerning the developed garments. The garments were well received as they provided a variety of style, cuts and can be used for a longer period. Smart maternity wear are every day clothes that fits women during and after pregnancy and provides proper fit for a healthy fetus and mother.

Keywords: Design aspects, smart maternity wear, pregnancy, physical changes, trimester.

Influence of Market Segmentation on Financial Performance of Fashion Merchandising Shops in Kenya.

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Abstract

Segmentation is the division of a large market into smaller homogeneous markets targets on the basis of common needs. Segmentation allows the fashion merchandising practices to better satisfy the needs of its customers and its growth. To be successful in fashion, merchandisers need to segment their fashion merchandise on financial performance so as to identify consumer behavior and anticipate their needs in all seasons. This study therefore sought to study influence of market segmentation on financial performance of fashion merchandising shops in Kenya. The study specifically focused on the influence of price and age. The study adopted, consumer demand theory, **social learning theory**. The study used descriptive survey design to obtain in-depth information from the respondents. The target population of this study was fashion merchandising shops in Kenya. The unit of analysis was 609 fashion merchandising shops. The unit of observation was the owner/manager of merchandising shops. Each shop produced one respondent who was either the owner or the shop manager. The study sample size was 167 respondents. Quantitative data was analysed by use of Statistical Package for Social Sciences (SPSS) version 24. Multiple regression analysis was employed to generate the regression model that was used in the study. The study findings showed that price and age have a positive and significant influence on financial performance of fashion merchandising shops in Kenya. The study concluded that offering of competitive price to products improves performance by attracting customers of different segments. Offering of discounts and credit purchase also attracts customers and hence increase customer base. Fashion shops should

also offer discounts and credit purchase to attract customers in order to increase customer base. This is because competitive prices represent value for money that attracts customers and this helps in creating a good customer relationship and strengthening the customer loyalty which ultimately improves the performance of the fashion company.

Keywords: Segmentation, price age, performance, fashion merchandising, Kenya.

Globalization Challenges for the Kenyan Textile Industry

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Abstract

The Kenyan economy has in the past benefitted from textile industry. Through economic development and employment creation in Kenya. However, with recent government development agenda of empowering manufacturing sector through reviving the industry, amid substantive challenges including establishing new textile firms, innovating new textile manufacturing techniques, high production costs to remain competitive in East Africa region and to large extent in the global arena. This study investigated the nature of scale economies and input relationships for the industry using a cost function with capital, labor, domestic intermediate goods, and imported intermediate goods as inputs. Results showed that there exist significant economies of scale and that major textile inputs are substitutes although some intermediary inputs are compliments. This implies that the textile industry faces challenges in its endeavor to be internationally competitive where input prices in the domestic market are sensitive to prices of imported intermediate inputs. It is recommended that the government should participate actively in the growth of textile industry through import substitution and tax concession policies in imported raw materials.

Keywords: Globalization, manufacturing, textile industry.

Hospitality and Textile Technology for Sustainable Development; A Conceptual Approach.

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Abstract

In fulfilling The Sustainable Development Goals (SDGs), Michuki Technical Training Institute has consistently contributed to economic development of Kenya and beyond through Food and Beverage, Catering and Accommodation courses, Fashion Design and Garment Making courses. This paper seeks to highlight the various technologies that are instilled in the learners and how they have led to a learner who is technically empowered with the right knowledge and skill needed in the market. These are realized in the following ways: the learner being sensitized on how to care for his environment by disposing of rubbish and chemicals in the right way, having the right communication skills for use in the market and entrepreneurial skills for self- development. The study uses The Conceptual Metaphor Theory which explains the technological terms used by use of mappings from the source to target. These help to simplify the terms by showing the value added by the technologies. Interviews are also conducted and are limited to class settings and workshops and photos provided where the learners are shown using the various technologies. Analysis of data is also shown using tables representing the technologies used. Finally, the results are presented, analysed, the conclusion is drawn and recommendations are given.

Keywords: Millenium goals, hospitality, food and beverage, textile, fashion design and garment making, sustainable, conceptual metaphor theory.

Socio-Cultural Determinants of Male Enrolment in Fashion-Related Training in Murang'a County, Kenya

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Abstract

Fashion design training has been gaining momentum with many youths enrolling in different fashion design courses in institutions across Kenya. This increase in enrolment has been attributed to economic gains attached to fashion design. However, despite this increase, it has been noted that enrolment among males is still lower than their female counterparts. This study examined socio-cultural factors that influence male enrolment patterns in fashion design courses in vocational training centres in Kenya. The study employed a semi-structured questionnaire to collect data from a random sample of 40 male students in four vocational institutions in Murang'a County, Kenya. Using Pearson R test, it was established that modernization, art, technology, lifestyle and education were positively related to male enrolment while customs, values, attitude, religion, family, sexism, lack of mentorship and confidence were negatively related to male enrolment to fashion design training programs. It was observed that both social and cultural factors influence male enrolment to fashion design straining in Kenya. It is recommended that mentorship programs be carried out specifically among boys, right from primary schools to ensure that they are well socialized and understand the importance of fashion industry as it is in other industries. Change of attitude, customs benefits and values must be encouraged by stakeholders to bridge the gender gap in fashion industry. Training institutions should adopt strategies that target men in recruitment of trainees. While fashion companies should influence positive attitude towards fashion using targeted advertising and promotions.

Keywords: Fashion, social factors, cultural factors, enrolment.

Livestock-Wildlife Interactions in Maasai Mara National Reserve, Kenya

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Abstract

This study was conducted to assess livestock-wildlife interactions in the Maasai Mara National Reserve (MMNR), Kenya. It aimed at determining causes of livestock incursions into MMNR, effects of interactions between livestock and wildlife in grazing areas and measures to control livestock grazing in MMNR. The study employed a survey research design where questionnaires and interviews were used to collect data. Structured questionnaires were administered to 14 randomly-selected households from each of three villages surrounding MMNR, namely, Oloosek, Kaboori and Oltepesi. Sampling was based on households situated within 5km from MMNR. Simple Random Sampling (SRS) was used to select the households to administer questionnaires. An elder from each of the three villages was purposively selected and interviewed. Data were sorted and analysed using Chi-square. Results revealed that shortage of grazing areas (40%), proximity to MMNR (29%), drought (16%) and inadequate land (15%) led to livestock grazing in MMNR. Livestock grazing had both negative and positive impacts on wildlife and livestock in MMNR. Negative impacts included; livestock depredation (36%), disease/parasite transmission (29%), displacement of wildlife from their habitat (20%) and competition for pasture (19%). Positive impacts included increased vigilance for wildlife by herders (37%). Measures instituted to mitigate negative impacts of livestock grazing on both wildlife and livestock were not effective (χ^2 =2.381, df =1, p=0.123). Mitigation measures suggested included increasing grazing penalties, deployment of additional rangers to keep livestock away and awareness-raising among the Maasai community. The study recommended alternative livelihood strategies for the Maasai; large-scale management of Maasai livestock, incorporating fewer animals, improved breeds, rangeland management and better marketing/pricing strategies.

Keywords: Livestock grazing, impacts, wildlife, Maasai Mara National Reserve, Kenya.

SUB-THEME: BUSINESS MANAGEMENT AND ENTREPRENEURIAL INNOVATION

Effect of Credit Management on Financial Performance of Sweet Potato Marketing Cooperatives in Kenya

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Abstract

Agriculture development is the most critical sector for most Sub-Sahara African countries owing to its significance in food security and employment creation. poverty reduction in most agriculture-based economies. However, most of the populations in the agriculturally productive regions live below a dollar a day. This study sought to determine the influence of credit management on financial performance of sweet potato marketing cooperatives in Kenya using a descriptive panel research design. Secondary data was used for analysis. The target population was four sweet potato marketing cooperatives with a total population of one thousand two hundred and forty-five (1,245) sweet potato farmers registered as at December, 2015 by the Commissioner of cooperatives in Kenya in Homabay, Bungoma, Busia and Siaya counties. Census sampling was used to sample the population. Secondary data over the ten year-period covering 2006-2015 was obtained and analyzed using multiple panel regression models. Limitations faced during data collection included high illiteracy levels amongst cooperative members. This was controlled by taking the officials through the facets of credit management to have them understand the concepts under enquiry. Results showed that credit management had significantly influenced on return on investment, a measure of financial performance of sweet potato marketing cooperatives in Kenya. It is recommended that produce marketing cooperative officials and members be trained on credit management.

Keywords: Credit management, financial management, marketing cooperative societies.

Business Risks and Interest Rate Spread among Kenyan Commercial Banks

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Abstract

This study aimed at establishing the relationship between business risks and interest rate spread of commercial banks in Kenya. It is anchored on a study "determinant of interest rate spread of commercial banks in Kenya and focused on the effects of business risks on interest rate spread of commercial banks in Kenya. Correlation research approach was undertaken. Data was collected using questionnaires and was analyzed using SPSS Version 19. After running reliability tests, factor analysis, descriptive tests, Pearson correlation, model of fitness and regression, results showed that business risks influence interest rate spread of commercial banks in Kenya. Participation of all the stakeholders on review of existing policies on stability and soundness of the banking industry is recommended. Banks should also explore internally and industry driven strategies that mitigate against some of the bank-specific factors associated with higher spreads. Results of this study suggest that business risks played significantly affect interest. It is therefore recommended that government and policy makers should implement sustainable political and macroeconomic environment to boost investors' confidence. Commercial banks in Kenya should thus participate in the interbank market or use the repurchase agreements for government securities to reduce liquidity risks to reduce fear and hence uncertainty in setting high interest rate spread.

Keywords: Interest rate spread, business risks, interest rate.

Relationship Between Financial Leverage and Profitability of Listed Manufacturing Firms in Kenya

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Abstract

Business deploys a number of strategies to improve financial profitability, including streamlining processes, outsourcing and integrating new technologies. Financial leverage offers an alternative way to increase profits by financing a portion of the business through loans or by issuing stock. This study sought to determine the relationship between financial leverage and profitability of listed manufacturing firms in Kenya. Relationships between short term debt, long term debt and debt equity on profitability of listed manufacturing firms in Kenya were examined in ten manufacturing firms listed in Nairobi Stock Exchange. Secondary data was collected and analyzed by both descriptive and inferential statistics using Statistical Package for Social Sciences. Descriptive analysis involved means, standard deviations, maximum and minimum across all variables. Inferential statistics included; Pearson correlation and multiple regression analyses. Results were presented in form of statistical tables. The was a negative relationship of short term debt (-0.362) and debt to equity ratio (-0.062) on profitability of listed manufacturing firms. On the other hand, long-term debt (0.349) positively and significantly affected listed manufacturing firms. These research findings can advise development of financing policies that would ensure sustainability of the financial performance. It would be advisable to reduce debt to equity to minimize effects on the earning before tax and where possible, manufacturing firms should consider using internally generated funds to finance their projects and that debt financing should only be considered when internal funds are fully exhausted.

Keywords: Financial leverage**,** short term debt, long term debt, debt equity, profitability.

Effect of Foreign Exchange Rates Volatility on Share Prices of Listed Firms in Kenya

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Abstract

Since 1993 when the floating exchange rate regime was established in Kenya, the country has experienced tumultuous times with regard to fluctuations in exchange rates. This continuous volatility has increased foreign exchange risk exposure which in turn has raised transaction costs of companies. Naturally, higher transaction costs results in lower profitability which subsequently affects the market prices of traded stocks. During the period 2008 to 2015, the Kenyan currency market experienced significant fluctuations in exchange rates – topping at the all-time high of Kshs 110 to the US dollar. This coincided with a period of depressed performance in the Nairobi Securities Exchange with regard to capitalization. This study sought to examine the effect of fluctuations in exchange rates on share prices of the listed companies in Kenya. Both the flow-oriented theory of exchange rates and efficient market hypothesis formed the theoretical foundation of the study. The study employed a longitudinal research design and a census of all the 61 listed companies was taken. The study utilized secondary data on the daily mean exchange rates between Kenyan shillings and United States Dollar and daily mean share prices for the 8 years period from January 2008 to December 2015. The relevant diagnostic tests for time series linear regression analysis were conducted to determine suitability of the collected data for the study. Regression analysis was performed to analyze the data. Both the F and t-tests were used at 5% significance level to test the significance of the overall model and coefficient of the independent variable respectively. The results of the study showed that exchange rates volatility had a significant adverse effect on the share prices. Based on this empirical finding, the study recommended that the managers of the Kenyan monetary system should adopt policies that promote stable exchange rate regime. Further, the study advocated for fast-tracking of the impending launch of the derivatives market in NSE to enable effective mitigation of the negative impact of exchange rates volatility in the economy.

Keywords: Derivatives market, foreign exchange rates volatility, share prices.

Performance of Construction Projects: Examining the Role of School Infrastructure Policy Governance and Project Management Practices

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Abstract

This study examined how school infrastructure policy governance influences performance of construction projects and whether project management practices mediated that relationship. The study was a correlational design cross-sectional survey. The target population was 920 head teachers and 86 District Education Officers (DEOs) in the 13 regions of Somaliland. Purposive sampling and proportionate stratified random sampling with replacement were used to sample 272 schools while simple random sampling was used to sample 20 DEOs. Data collection was done through self-administered questionnaires for head teachers and semi-structured interviews for DEOs. Questionnaire pilot testing was done on 28 head teachers. The survey response rate was 90.8% (247 head teachers) for questionnaires and 100% (20 DEOs) for interviews. Path analysis was used to analyze the variable relationships. Relationships among the variables were tested using t-tests at 5% level of significance. School infrastructure policy governance exert a significant direct effect ($b = -0.3283$, $t = -8.2143$, $p < 0.001$, $R^2 = 0.5250$) and a significant indirect effect (0.2755, CI [0.2283, 0.4645]) on performance of construction projects. A direct negative linear relationship exists between school infrastructure policy governance and performance of construction projects. Policy governance exerts its influence on performance of construction projects through project management practices which mediate the relationship. The study was limited to construction projects in public primary schools in seven sampled regions in post-conflict Somaliland.

Keywords: Policy governance, project management practices, performance, construction projects, mediation.

Selective Hiring and Organizational Performance

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Abstract

Selection is an important human resource function because through it quality human resources join the organization. Human resources give an organization competitive advantage and dictate organizational performance. Previous studies have shown that selective hiring significantly effects organizational performance in private organizations. This study determined the effect of selective hiring on organizational performance of three state corporations listed in Nairobi Stock Exchange. Descriptive research design was used. A questionnaire was used to sample 5866 employees of the three state corporations. Results showed that selective hiring significantly influenced organizational performance ($r = 0.551$, p-value < 0.001). This shows selective hiring independently explains 30.4% of the variation in organizational performance.

Keywords: Hiring, organizational performance**.**

Liquidity Management and Financial Sustainability of Deposit Taking Savings and Credit Cooperative Societies in Kiambu County

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Abstract

Savings and credit cooperative societies (SACCO) have gained prominence in many countries due to their immense contribution to poverty reduction and economic development. They are a source of livelihood to many people especially the low income earners. Despite their role in community and economic development a number of SACCOs have been faced with challenges leading to poor performance while others have been declared bankruptcy leading to massive loss of customers' savings and investments. One of such major challenges is poor liquidity management which has been cited as a key concern for many Saccos leading to constrained growth and survival. This study sought to assess the effect of liquidity management in terms of liquidity policy, liquidity funding and liquidity

risk management on financial sustainability of Saccos with particular emphasis on deposit taking Saccos in Kiambu County. 46 Saccos were randomly selected and used as a source of primary data using a self-administered questionnaire while secondary data was collected through review of literature from online journals. Descriptive and inferential statistics were used in data analysis. Results showed a significant positive relationship between liquidity policies, liquidity funding, liquidity risk management and financial sustainability of the sampled Saccos. It is recommended that the deposit taking Saccos should develop and implement liquidity management policy to guide to liquidity management, that Saccos should set aside a liquidity management fund to facilitate any liquidity shortfalls during emergencies and that they should develop and implement a strong liquidity management system to support evaluation and monitoring any liquidity risks and guide appropriate action.

Keywords: Liquidity, financial sustainability, liquidity policy, liquidity risk.

Tourism and Value Addition in Rwanda's Economy

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Abstract

Measurement of tourism economic impacts is important in monitoring progress towards meeting planned socio-economic goals. However, there has been insufficient attention to rigorous analysis of ramifications of tourism beyond accounting for initial impacts. This study evaluated economic impacts of tourism in Rwanda by examining its effects on value addition. Rwanda's 2014 Input-Output table was used to compute direct, indirect, induced and total (SAM Type) multipliers which were interacted with internal tourism demand data from Rwanda's 2014 tourism satellite account to estimate these impacts. Value added multipliers indicated that tourism has strong linkages with service sectors. Results showed that tourism internal tourism demand generated 11.1% of total value added in the economy in 2014. Thus increasing internal tourism demand in Rwanda would potentially lead to increased value addition in agriculture and other associated sectors. This study's main contribution is taking into account the predominantly informal sector of Rwanda's economy especially with respect to the domestic tourism market. Future studies could estimate value addition in the economy using computable General Equilibrium models in order to capture dynamic aspects.

Keywords: Input-output analysis, social accounting matrix (SAM), multiplier effects, total tourism internal demand, value addition, Rwanda.

Human Resource Management Practices Influencing Organization Performance: A Case Study of Equity Bank Kenya

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Abstract

An organization's performance is often seen as an indicator of market acceptance and success. Performance is considered top strategic priority for most firms yet only few companies achieve optimal performance and even fewer maintain it. The outcome of HRM practices on organizational performance has been given different perceptions, predominantly on the relationship between HRM practices and their effect on organizational performance especially on private banks. It is therefore prudent to look into HRM practices and their effect on organization performance targeting Equity bank Kenya Ltd. This study sought to establish the effects of human resource management practices on organizational performance. The objective of the study was to investigate the effect of recruitment and selection, HR training and development, reward management and employee relations on organizational performance in a Kenyan bank. The study was guided by three theories Resource-Based View Theory, Social Exchange Theory (SET) and Human Capital Theory. The study adopted a descriptive research design. Study population consisted of 113 management staff of the target bank headquarters in Nairobi. Stratified proportionate random sampling technique was used to select the sample. Simple random sampling was used to select 34 respondents by taking 30% from each stratum. Primary data was collected using structured questionnaires and analyzed using descriptive statistics and outcome presented on tables and graphs. Results showed that training programs and rigorous selections positively influenced performances. Excellent induction too influenced performances. Rewards management on the other hand was not fair since it was not done on merits and this affected bank performances, and on employee relations Individual grievance and disciplinary policy and practice influenced performances.

The study concluded that among the four variables rigorous recruitment and selection and employee relation significantly influenced the organization performance.

Keywords: Human resource, management practices, organization performance, Equity bank, kenya.

Assessment of the Value Chain of Tilapia Fish as Food to the Local Market to Identify Investment Gaps in Lake Turkana, Kenya

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Abstract

Lake Turkana Fish production currently averages 8,000 metric tonnes valued at 600 million Kenya Shillings annually accounting 4% of the total fish production from Kenyan waters. Tilapia dominates the catches accounting for between 38%-42% of the volume of fish landed and may reach 80% during "Tilapia boom" seasons. Lack of information on opportunities available at various nodes of the Lake Turkana tilapia fish value chain has made it difficult to make investment decisions. This study assessed the value chain in relation to tilapia as food to the local markets and identify investment gaps. Data was collected through interviews and secondary sources from both market actors and managers using snow-ball sampling technique. 81 respondents wre itnterviwed. Results indicate that tilapia trade ranges from small-scale to medium scale enterprises with a capital outlay of at least Kshs 300 going upwards of Kshs 100,000 and was dominated by women at 79%. More than 70% of the respondents joined the tilapia fish business using money from individual savings and or family support while bank loans and microfinance credit facilities accounted for 10% of investment. The main customers are consumers (69%), retailers (21%), wholesalers (5%) and local processors (5%). Most tilapia was sold fresh (88%), salted-sundried (9%) and dried (3%). The tilapia value chain has the potential to meet local food supply demands, provide employment opportunities and improve local livelihoods. It is proposed that deliberate financial support be considered to support value chain addition to support local consumption, improve profitability and support regulated export of slated sundried tilapia to limit overfishing.

Keywords: Value chain, Tilapia fish, food, local market, Lake Turkana**.**

Corporate Social Responsibility Strategy and Financial Performance of Deposit Taking SACCOs in Kenya

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Abstract

It is imperative that a firm operates in an ethical and sustainable way, deals with its environmental and social impacts for it to remain competitive in a dynamic market place. This study sought to establish the relationship between Corporate Social Responsibility strategy and the financial performance of deposit taking Savings and Credit Co-operatives societies in Kenya. The SACCO subsector is part of the Kenyan Co-operative sector comprising of both financial and non-financial cooperatives. Saving and credit co-operative (SACCO) are the financial cooperatives. They are an important part of the financial sector in Kenya, providing savings, credit and insurance services to a large portion of the population. Stakeholder management is critical in creating trust and confidence in key stakeholders. It has been argued that CSR has an indirect influence in determining whether or not a company is or remain successful or not. Descriptive research method and inferential analysis was used in this study. Questionnaires ware used to collect primary data. Pilot study was carried out to check on the reliability and validity of the instrument and a Cronbach's Alpha of 0.915 was obtained. Data was collected from a sample of 54 Deposit taking SACCOs out of a population of 180 licensed DTS. This made a sample of 130 respondents. Data was then edited in the field to clean it up and processed using descriptive analysis and multiple regression analysis performed to determine the relationships between the stakeholder generic strategies and performance of SACCO societies. Results showed that CSR strategy has positive relationship with performance of deposit taking SAACOs. The research contributes to both stakeholder management and CSR theories by supporting reports of previous studies that stakeholder management strategies have positive relationship with SACCO societies' performance. It is advisable for managers to be proactive in stakeholder management and to adopt CSR as a strategy to enhance various relationships and financial performance of their SACCOs.

Keywords: Corporate social responsibility, deposit taking SACCOs, financial performance.

Role of Government Environmental Regulations on Petroleum Supply Chain Management in Kenya

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Abstract

There has been increased consumption of petroleum products in the recent past in Kenya as the country seeks to achieving 2030. This increased consumption has obvious implications for the operations of the petroleum industry in the country (both upstream and downstream), including the risks posed to the natural environment and human safety. This study sought to assess the role of government environmental regulations on petroleum supply chain management by surveying oil marketing companies in Kenya. A sample of 180 respondents was randomly selected from 36 oil marketing companies. Data was quantitatively analyzed using SPSS for descriptive statistics and inferential while AMOS was used for structural equation modeling. Results showed high awareness level (73%) of the existence of environmental regulations among oil marketing companies' staff. Government environmental regulations also positively influence petroleum supply chain management for they lead to quality petroleum products, high compliance levels as well as greening of the supply chain despite high operational costs. A consultative approach should be considered when developing these regulations and there is need for government to embrace continuous inspections to achieve sustainable environmental management. There is need for the industry players to adopt supply chain management practices that promote greening the petroleum supply chain.

Keywords: Oil spill mutual aid group, regulatory agency, regulation, supply chain management, Petroleum Act, Standard Gauge Railway.

African Sausage(Mutura) for Enhancing Small Scale Business for Economic Development in Kenya

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Abstract

African sausage popularly known as 'Mutura' is prepared from grinded meat, or boiled meat waste cut in small pieces to form stripe and placed in a cleaned small and large intestine from slaughtered animals and left to roast in lit African stove (jiko). Most of Matura sellers and buyers love the business done in the evenings earliest as from 6.30 pm. It is a booming business for empowerment of the unemployed youths and economic development yet, it is prepared by the sellers and eaten by the buyers in the evenings in all towns in Kenya. The objective is to investigate the factors influencing the sellers and buyers engage in the business only in the evenings daily not throughout in daytime in most towns of Kenya. The research was a survey method through descriptive research design and a sample of sellers and buyers were selected purposely for the study. The key findings indicate buyers of all categories love to engage in the business in the evenings or night time. It is concluded 'mutura' is a booming business for empowerment of the unemployed youths and enhancing economic development in Kenya. Therefore, it is recommended that youths who are unemployed and interested in business entrepreneur engage in 'Mutura' business as it require small amount of capital for the start and sustainability of the business and enhancing economic development in Kenya

Keywords: Business, empowerment, economic developments, youths.

Determinants of E-Commerce Usage in the Kenyan Banking Sector

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Abstract

Despite the existing evidence that e-commerce usage is moderated by local environmental factors influencing its usage are under-researched in Kenya. This study sought to determine the factors influencing e-commerce usage in the Kenyan banking sector. Effect of firm size, top management support, competence and organizational learning ability on e-commerce usage in Kenya were investigated. Grounded on the Technological, Organizational and Environmental model (TOE), five hypothesis were tested in the study to determine the drivers of e-commerce usage. A descriptive cross- sectional survey was carried out among 32 of the 43 commercial banks operating in Kenya as at December 2018. Sampling was done using stratified random sampling, while purposive sampling was used to select 96 respondents to participate in the primary data was collected using a questionnaire administered to the heads of ICT, Operation and Finance departments of the selected banks. Data analysis was carried out using Statistical Package for Social Sciences (SPSS) and coefficient of determination and regression analyses undertaken to test the hypothesis. Results showed that significant factors included; Top management support, organization learning ability, competitive pressure and technological competence while firm size was not supported. The study extends the existing participation that firm organizational and environmental factors influence usage of e-commerce applications in Kenyan banking industry and also confirm effectiveness of TOE framework for conducting studies on technology usage at the firm level.

Keywords: E-commerce, banking sector, Kenya.

Contextual Influences of Scholarly Ambition on Entrepreneurship Education in Kenya

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Abstract

Increased involvement in entrepreneurial activity in the past few decades has generated an overwhelming interest in entrepreneurial careers and academic opportunities in entrepreneurship. Entrepreneurship education is multidimensional and manifests on the premise of creative strategies, innovative techniques, courageous leadership and understanding of trends in the business environment. Scholarly ambition as a Social Cognitive Career predictor is useful in describing intrinsic motivations in career choice as it provides the basis for motivation, determination, and strength when making career choices. Scholarly ambition is not only involved in defining entrepreneurship discipline but also stimulates involvement in the entrepreneurial process. This study sought to determine the role of scholarly ambition in pursuit of entrepreneurship specialization amongst undergraduate students in Kenya. A correlation quantitative research designed as a descriptive survey had a sample of 327, third year students who participated in the research. Data was collected using questionnaires modeled through hierarchical regression and analyzed using SPSS version 24 and was presented in form of comprehensive tables that depicted the relationship between scholarly ambition and entrepreneurship education. There was statistically significant and positive relationship between scholarly ambition and entrepreneur education specialization. It further revealed that, Scholarly ambition, as an intrinsic factor, contributed to 24.7% of factors affecting entrepreneurship education specialization uptake. The study further went on to give recommendations relevant to stakeholders including students, educators, parents, institutions and government agencies based on a better understanding of the role scholastic ambition plays in determining student choice of career specialization.

Keywords: Scholarly ambition, entrepreneurship education, entrepreneurship, career.

The Impact of Financial Innovation on Monetary Sector Policy in Kenya

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Abstract

The study examined the relationship between financial innovation and monetary sector development in Kenya using Generalized Method of Moments (GMM) approach based on Ordinary Least Squares (OLS) technique and time series annual data over the period between 2000 and 2017. The GMM version is superior over OLS technique because it allows adjustment of long-term variation between financial innovation and macroeconomic development. Financial innovation is measured by five indexes: currency-money (CM) ratio, e-money (EM), intermediation ratio (IR), financial ratio (FR), and e-payment (EP). Monetary policy development is measured by seven indicators, namely: real GDP, money supply (MS3), domestic credit (DC), interest rates, inflation rate, exchange rate, and stock market development. Based on the empirical results, evidence shows that financial innovation (i.e. EM, IR, FR, and EP) had significant impact on monetary sector development. Rapid innovation as a phenomenon in the past decades has changed the array of financial services available to customers and increased the efficiency of the financial sector (or system), but at the same time, complicated the environment in which Central Bank of Kenya (CBK) implements its monetary policies. This study was important for the purpose of combating the implications associated with the future development of these innovations in the financial system and the conduct of monetary policy. Also, the CBK) should be able to conduct a monetary policy process based on the changing financial environment by implementing essential reforms and critical forward-looking policies for a sustainable financial development and economy.

Keywords: Financial innovation, monetary policy development, GMM approach, Kenya.

A Simple, Sustainable, Integrative Analytical and Predictive Approach for Actualizing Precision Medicine for Cancer Management: A Model for Resource-Limited Settings

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Abstract

In spite of our knowledge of the strong influence genomic variations have on how the human body metabolize drugs, health, diseases across diverse populations, majority of the testing and trying of the current chemotherapeutic drugs used in Kenya (and Africa), if not all is done in developed countries. Of essence, despite efforts to include diverse backgrounds, majority of the populations used in these clinical trials have potentially different genetic make-up, therefore not true representatives of African populations. As a result, use of these chemotherapeutic drugs is characterized by high failure rates, relapses and low survival rates. Consequently, new African population-specific therapeutic targets, diagnostic and prognostic biomarkers for effectively tailor-making clinical decisions regarding selection and dosage of these drugs are urgently required. In addition to improve effectiveness and provide a more targeted approach with the view thus minimizing toxicity, adverse effects and optimizing the drugs' safety. In line with that, several targeted therapies have shown great promise in cancer management in comparison to the non-selective cytotoxic drug therapies. To leverage on this promise, Precision Medicine approach whereby individual variations in genomic, anatomical, physiological, environmental and biological factors exposure, human microbiome and lifestyles are taken into account when making clinical care decisions. Notwithstanding the low genomic literacy, testing capacities in resource-limited settings such as Kenya, simple, sustainable integrative analytical, predictive modeling approaches to identify new, independent African population-specific therapeutic targets, relevant, affordable, readily available genetic testing for the initial diagnosis, prognostic biomarkers for monitoring response to therapy can be adopted to effectively actualize a sustainable Precision Medicine strategy. Such methods or models are currently lacking, while studies with African populations in this hugely potential field of "Big Data" analytics are scarce. By use of Meta-analysis approach of pooling together of treatment effects of five targeted therapeutic strategies, five conventional cytotoxic drug therapies, Radiotherapy in Breast and Colorectal cancers, this study proposes to develop such methods and model applicable to resource-limited settings.

The pooled treatment effects of the three therapeutic strategies in the two cancers will be correlated for any significant differences. Subsequently, the pooled treatment effects as the dependent variables, the various individual variabilities as the independent variables and using simple correlations and Multiple Regression Analysis (MRA), least square method, creating dummy variables to build predictive models. Results from this pilot study will inform future larger studies with African populations and guide identification of African population-specific targets, biomarkers and actualization of an effective and sustainable Precision Medicine strategy for cancer management in Kenya and Africa. This will have a direct impact on cancer care, help in attainment of the United Nations Sustainable Development Goal (SDG) number three and Government of Kenya (GOK) "Big Four" agenda of Universal Healthcare Coverage (UHC).

Keywords: Targeted cancer therapies, tyrosine kinase receptor genes, serine threonine lipid kinases, immunotherapies, antibody drug conjugates (ADCs), anti-metabolites, DNA binding, mitotic inhibitors, alkylating agents and radiotherapy.

Joint Moderating Effect of Competitive Forces on the Relationship between Linkage Strategies and University Performance

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Abstract

This study sought to assess the joint moderating effect of competitive forces on the relationship between linkage strategies and performance of universities in Kenya. Resource based view and Porter's five forces model were used as the main theories anchoring the study. Cross-Sectional survey was adopted as the research design. The study population consisted of sixty-five (65) public and private universities incorporated in Kenya. Of these, forty-seven (47) universities which had undergone at least one graduation cycle were sampled. Primary and secondary data was collected using semi-structured questionnaires and review of existing university documents and regulatory bodies' websites respectively. Correlation and regression analyses were carried out to analyze data and to test hypotheses. Although it was not possible to include all the determinants of institutional performance, balanced score card was appropriately used to represent financial and non-financial aspects that constitute performance indicators. It was established that joint moderating effect of resources and industry forces on the relationship between linkage strategies and organizational` performance is different from their separate effects. The key

recommendation that the study offers as insight to theory, university authorities and policy makers, is the need to consider firm resource conditions and industry forces as critical determinants during strategy formulation and implementation process in order to enhance university performance and linkage with economic sector. The main limitation of this study is that primary data was collected from only one respondent per university but common methods bias was mitigated through use of additional secondary data to validate primary data.

Keywords: Linkage strategy, industry forces, resource conditions, moderating effect, university performance.

Cost of Capital, Firm Size and Financial Distress

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Abstract

Financial distress (FD) is a global muddle with trends that are traceable back to historical dates in connection to financial crisis experienced by households, firms and economies. Kenya documents substantive evidence of FD and corporate failure across the economic sectors over time inclusive of both listed and unlisted firms, with extreme cases of filing for bankruptcy. This is an indication of a missing link between financial surveillance and business management. This may also lead to increased unemployment rates and lost public investment in Kenyan firms listed in the bourse if the situation is not remedied. Past research concentrated more on prediction accuracy of FD models and effects of capital structure on firm performance. This study therefore explores the influence of cost of capital on FD and examines the moderation effect of firm size on the relationship between cost of capital and FD. The research objective is anchored on Modigliani and Miller's second proposition and Trade-off theory. A positivism research philosophy was adopted for quantification and measurement of generalizable financial statistics. Retrospective longitudinal research design was used on a target population of all non-financial firms listed in the Nairobi Securities Exchange (NSE). Panel data was collected from audited annual financial statements, daily stock prices and market indices relating to a 10-year study period from 2006 – 2015. Hierarchical panel regression was used to analyze the multi-dimensional financial data after running model and linear regression diagnostics. Results showed that cost of capital has a significant negative relation with FD. Cost of equity (Ke) rises with cost of debt (Kd) as shareholders demand higher returns in exchange for exposure to financial risk from debt leverage. Interaction term (cost of capital*firm size) had no effect on

FD. Kd and Ke significantly influenced FD positively and negatively respectively. Interaction Kd*firm size had a positive insignificant influence on FD while interaction Ke*firm size had a negative significant effect on FD. Diligent capital budgeting is recommended so that firms can only invest in feasible ventures that surpass the cost of capital.

Keywords: Cost of capital, cost of debt, cost of equity, firm size, financial distress.

Influence of Budget Constraints on Implementation of Strategic Plans among Mission Hospitals in Kenya.

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Abstract

Strategy implementation is key for the success of an organization. This is because well formulated strategies may fail to produce the desired performance, if they are not successfully implemented. Making a strategy work or implementing it throughout the organization, is however, not an obvious process. In the recent past many strategic plans have been prepared and still have remained in the shelves without any benefits being realized from their implementation. In 2017 according to research only 5% of the companies in Kenya were able to fully implement their strategic plans. Therefore, the main purpose of this paper was to determine the influence of budget constraints on implementation of strategic plans among mission hospitals in Kenya. The study used a descriptive and correlation research design to explain whether there is any relationship between the dependent and the independent variables. The target population of the study was 380 employees working in the mission hospitals in Nyeri out of which a sample of 114 employees was selected using the stratified random sampling and later selected randomly using the simple random technique. Primary data was collected with the help of structured questionnaire. The questionnaire were administered using drop and pick procedure while secondary data was collected from secondary sources and also from the respective hospitals websites. The collected data was cleaned, edited and analyzed with the help of SPSS (23) where descriptive statics and multiple regression analysis were used to establish the relationship between the independents and the dependent variable of the study. The findings of the study were analyzed and presented inform of tables for easier interpretation and presentation and the results obtained will form the basis of recommendation. The study established

that budget constraint significantly influenced implementation of strategic plan among mission hospitals in Kenya. Allocation of adequate financial resource had highest mean (4.22) which implied that inadequate resources were being made on strategic plan implementation. 73.6% of the respondents agreed that material price fluctuation also significantly influenced the implementation of strategic plan. It was recommended that mission hospitals budget constraint as one of the major factor that influenced strategic plan implementation among mission hospitals. It was recommended that mission hospitals should implement their strategic plans using adequate budgetary allocations as the research findings indicated that proper implementation strategic plan improves the innovation capacity of hospital which in return creates a competitive strategy.

Keywords: Budget constraints, strategic plans, Mission hospitals, Kenya.

Knowledge Management Capability, Market Capitalization Agility and Competitive Advantage

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Abstract

From the dynamic capabilities view of the firm, existing literature posits that there are at least two sets of strategic capabilities in a firm, lower order and higher order capabilities. However, empirical evidence on whether and how the higher order capabilities mediate the relationship between the lower order capabilities and performance of organisational is scarce. Using a cross-sectional sample survey of 172 respondents from 39 commercial banks in Kenya, we investigated the mediating direct relationship between KM capability, KMC (lower order capability) and performance and the mediating role of market capitalizing agility, MCA (higher order capability). Our findings were that though relationship between KM capability (KMC) and competitive advantage was significant ($t = 3.098$, $p < 0{,}001$; $r = 0.231$, $p = 0.002 < 0.05$), market capitalizing agility significantly (KMC: $t = 4.029$, $p < 0.001$; MCA: $t = 5.185$, $p < 0.001$; R2–change = 0.13; $R^{2KMC} = 0.053$; $R^{2KMC, MCA} = 0.183$) mediated this relationship. The findings imply that KM capability should be developed further and used to improve market capitalizing agility which would in turn result in capturing market opportunities that are profitable to the organisation. The descriptive findings suggests that there is satisfactory KM capability (KMC: M = 4.12, SD = 0.96) while marketing capitalizing agility (MCA: M= 3.72, SD = 1.23) is less developed in the studied firm. This study has important implications for organisations with regard to the imperative to develop their KM capability because

it is an antecedent of effective market capitalizing agility which is positively and significantly related with competitive advantage.

Keywords: KM capability, market capitalizing agility, competitive advantage.

Citizen Engagement in Social Health Insurance Purchasing, in Selected Counties in Kenya

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Abstract

Health care financing (HCF) is one of the building blocks of a health system. Kenya envisions to have Universal Health Coverage (UHC) by 2022. To achieve this, the National Hospital Insurance Fund (NHIF) was identified as a vehicle towards the realization of UHC. NHIF is a social insurer, NHIF collects revenue, pools risks, and purchases health services for its members. Using capitation as a strategic purchasing model to provide primary care health services (PCHS). Strategic purchasing requires the purchaser to actively engage with the government, citizens and providers. This study aimed to establish the extent of citizen engagement in NHIF purchasing of PCHS. The study sought information on citizen knowledge of benefit package, NHIF communication to citizens, determination of citizen views and values, NHIF accountability, citizen choice of PCHS provider and how they all influence access to NHIF, PCHS This was a cross sectional research that sampled 426 patients from 66 health facilities accredited to provide NHIF, PCHS, from two counties achieving a 93% (395) response rate. Results showed that, 366(93%) patients knew the NHIF, PCHS benefit package, 226(57%) indicated that NHIF communication to them was adequate, 280(71%) that NHIF does not take into account their views and values, 272(69%) that NHIF is not accountable to them. 269(68%) knew how to select outpatient facility, 111(28%) did not receive NHIF, PCHS. Logistics regression analysis of citizen engagement factors and access, indicated that NHIF communication to citizens ($p < 0.05$, OR=2.358, 95% CI [1.399-3.975]), purchaser accountability ($p<0.05$, OR=2.073, 95% CI [1.017-4.226] and provider choice ($p<0.05$, OR=2.990, 95% CI [1.817-4.920) added significantly to the model/prediction. Results pointed to inadequate engagement of citizens in NHIF decision making and this may hinder access to NHIF PCHS to some extent. It is recommended that NHIF should establish public needs and preference through public forums, establish means of eliciting citizens' feedback, complain mechanisms and also act on these complains when raised, that Citizens be informed on how the

capitation system works and that NHIF should visit health facilities to establish if patients are accessing PCHS.

Keywords: Universal health coverage; social insurance; primary care health services, NHIF national scheme, citizens, Kenya.

Relationship between Social Demographic Factors and Job Embeddedeness of University Catering Employees in Nairobi City County, Kenya

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Abstract

Employees with high levels of embeddedness are likely to exhibit high levels of attachment to the organization, whether they want to or not. Job embeddedness results in employees increased intention to stay with their current organization and/reduces the degree to which they search for other jobs. The study established the relationship between social demographic factors and job embeddedness of university catering employees in Nairobi City County, Kenya. The relationship between the two variables was established using the two tailed Pearson product moment correlation coefficient. A p-value of between 0.010 to 0.041 implied, insignificant relationships, 0.041 to 0.70 a moderate relationship, > 0.70 a significant positive relationship while a negative value implied, an inverse relationship between the variables. The R-value represented the p-value while ∞ represented the level of significance. There was a significant positive relationship between gender and Job embeddedness(r=.833, ∞=.017), a moderate significant positive relationship between age and Job embeddedness (r=.290, ∞=.086), a moderate significant marital status and Job embeddedness(r=.613, ∞=-.041), a moderate significant relationship social demographic factors (Level of education) and Job embeddedness (r=.247, ∞=-.094), a moderate significant relationship between employees experience and job embeddedness (r=.247, ∞=-.094) and a moderate significant positive relationship between Self-description of occupation and job embeddedness(r=.512, ∞= .054). Thus, social demographic factors play a key role on job embeddedeness. This aligning social demographic to job embeddedness will enable employers to address the controversies of the employment relationships of the 21st century to promote organizational attachment, commitment and loyalty.

Keywords: Social demographic, employees.

Knowledge Management Capability, Demographics and Market Capitalizing Agility

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Abstract

In this study, we examine the relationship between knowledge management capability and operational agility which is an important antecedent of competitive advantage in organisations. We first set out to determine the KM and organisational agility dispositions and then tested the relationship between the two in the Kenya banking sector using data from 172 respondents from commercial banks. Data was collected using structured questionnaires that were derived from literature and tested for validity and reliability prior to their use. We found that the relationship between knowledge management capability and market capitalizing agility was weak, negative and not significant at p < 0.05 but at p <0.1 (r = - 0.142, p<0.063). We also compared the mean scores of the two strategic capabilities across a set of demographic variables and found significant (p < 0.01) variation in the two strategic capabilities across age, level education, and working experience. Further, a negative and significant relationship (p < 0.05) was found between both strategic capabilities and all the demographic variables. This one of first attempt to examine the relationship between KM capability (lower order capability) and market sensing agility (higher order capability) in a developing economy context. The findings imply that KM capability has not reached the threshold to positively influence the market capitalizing agility which is necessary for superior performance and that there are demographic characteristics that impact both knowledge management capability and market capitalizing agility. It is recommended that a further examination of KM capability and market capitalizing agility be conducted to determine what aspects lead to negative relationship between these two capabilities and between them and age, education and work experience.

Keywords: Knowledge management, market sensing agility, demographics.

Young Movers Beaded Art Work Enterprise: Entrepreneurship for Self Employment in Kenya

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Abstract

According to 2016 World Bank Annual Report, the future of Kenya's competitiveness in the global economy remains bleak as the country struggles to contain the heaviest youth unemployment burden in East Africa. Kenya recorded 39.1 percent unemployment rate according to 2017 report by United Nations; Human Development Index (HDI). The latest statistics continue to reflect a shockingly high youth unemployment rate due to harsh economic and political environment. As so many addicts and former addicts have discovered, there is a strong relationship between alcohol/drug abuse and unemployment. The fact is that unemployment heightens a person's likelihood to drink, smoke, or have a drug addiction. In order to address the highlighted unemployment challenges. In Kenya today, and by extension many parts of Africa, young people are no longer guaranteed any meaningful employment after graduating from training institutions. They are increasingly expected to explore their own talents and exploit any opportunities available, in order to break-off from the white-collar job seeking norm. Young people are expected to be more enterprising and innovative thus utilize locally available materials in order to make ends meet. In an attempt to respond to these societal challenges, Young Movers Beaded Art Work Enterprise (YMBAWE) was born with the main aim of providing an opportunity to unemployed youths to explore their talents in art work thus generate little income for subsistence. YMBAWE is an upcoming Kenyan hand crafted beaded art enterprise, located at the outskirts of Mathare slums within Kiamaiki ward in Nairobi City, Kenya. Each product at YMBAWE is handcrafted in limited edition batches to provide much sought-after appeal to the pieces, while offering unique designs that are handmade to the highest standards possible. The products include beaded flowers, plants, hair clips, wall frames, wall clocks, logo designs and other artifacts. The raw materials include simple beads, wires, metals, hangers, card boards, glass materials and plastic planters. Most of these raw materials are acquired from the waste materials. This further contributes immensely to environmental conservation. These products add value, ambiance and long lasting beauty to any environment such as offices, homes, hotels, wedding, anniversary parities and all manner of events. As opposed to natural flowers which are highly perishable, a beaded flower comes in almost all required color codes and can stay as long as the owner wants to continue using it. YMBAWE has so far employed six (6) young people and four (4) individuals to oversee its operations. The vision is to provide employment for at least five hundred (500) young people by the year 2022.

Keywords: Young movers, entrepreneurship, unemployment.

The Relevance of Research to Policy Decision-Making, Formulation and Implementation

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Abstract

This paper puts the relevance of research into perspective in the policy-making, formulation and implementation context. It points out that there are differing policy goals to sustainable development and the use of research might be vital for one element. Although the debate on the use of research results for policy decision-making and implementation processes is not new and its features have changed over time, the issue has gained greater prominence in recent decades following the major processes of world change that increasingly call for concrete evidence to support or challenge the innovations that are implemented in a variety of contexts, including legislative policies and systems. Viable and appropriate policies are necessary for sustainable economic growth and poverty reduction. Policies are made by policy makers the persons bestowed with the power, either by citizens or a group of people in a society, to make decisions. However, research should provide an important input in policy decision making, formulation and implementation. It shouldn't be taken for granted that the relationship between research and policy is straightforward, with good research, policy design will tend to be more relevant and their results are likely to deliverer the desired impact in the country. Why is it that more often policy making isn't research based? This paper responds to the question raised by those who wonder how better use can we make out of research in the policy-making, formulation and implementation process? The findings point to significant gaps in the research to policy to practice pathway, particularly in achieving sustainable development in developing countries with a focus on policy research. A considerable part of this thinking addresses the problem from a more traditional perspective, which regards research results as depicts the decision-making process simplistically and linearly, and thus restricts strategies to the suiting of the research.

Keywords: Sustainable development, developing countries, policy-making, society, research.

Effects of Financing Structure on Financial Performance of Saccos in Kikuyu Sub-County, Kiambu County, Kenya

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Abstract

It goes with saying that SACCOs play noticeable roles by providing financial facilities. They implore funds internally and externally enabling continuous banking services. However due to high cost of capital, SACCOs undergo financial distress limiting their financial performance. This research study aimed at analyzing the effects of financing structure on the financial performance of SACCO's listed in Kikuyu Sub-county Kiambu, Kenya. The moderating effect of SACCOs' location was considered. This descriptive quantitative study an earthed the financing structure pattern and the effects it has on financial performance of SACCOs. The dependent variable was measured by dividing surplus over equity while the independent variable was attained by dividing debt with equity. The explanatory research design was adopted to establish contributory properties of an independent variable while simple stratified sampling was adopted. Data collection was effected using a data sheet distributed to all the SACCOs. The research was pegged on trade-off, pecking order and market timing theory. Data obtained was an extract from audited published business reports of all registered SACCOs by end of the year 2017 in Kikuyu Sub-county Co-operatives Office. It was put in SPSS and analyzed quantitatively using correlation, analysis of variance and regression analysis. Results obtained showed that SACCOs financing structure had moderate correlation significantly explaining the variance in financial performance. The moderating conclusion exposed that urban-based SACCOs, independently and significantly explained the variance between the financial structure and financial performance. This research finding recommends the adoption of more combined financing options leading to improved financial performance. Research findings called for government becoming more instrumental in offering financial assistance to support SACCO's to cope with the intensified rebate charges charged by commercial banks. This focus would enhance SACCOs' entrepreneurial performance leading to members' wealth maximization.

Keywords: Financing structure, financial performance, Saccos, Kenya.

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- Abstracts, no more than 300 words in Times Roman font 12, covering background, objectives, methods, results and conclusion. Contact details (title, name, institutional affiliation, email address, and telephone) to: **conference2019@kyu.ac.ke**

IMPORTANT DATES

Deadline for Submission of Abstracts	14th July, 2019
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