



# *Maasai Mara University*

**6<sup>th</sup> International Conference 2021**

**On Research and Innovation:  
Infrastructural Preparedness  
for Emerging Global Challenges**

*28<sup>th</sup> – 30<sup>th</sup> June 2021*

***BOOK OF ABSTRACTS***



*conference2021@mmarau.ac.ke*  
*www.mmarau.ac.ke*

# **BOOK OF ABSTRACTS**

## **6<sup>TH</sup> MAASAI MARA UNIVERSITY ANNUAL INTERNATIONAL CONFERENCE**

**28<sup>th</sup> – 30<sup>th</sup> June 2021, Narok, Kenya**

### **THEME**

- ♣ Research and Innovation Infrastructural Preparedness for Emerging Global Challenges

### **Sub Themes:**

- ♣ Tourism, hospitality and leisure in a post-pandemic world.
- ♣ Building resilient systems to respond to environmental shocks in health, agriculture, natural resources and economic systems.
- ♣ Adapting to the new normal in the academic environment: challenges, prospects and opportunities.

### **Compiled by**

*Conference Organizing Committee, Maasai Mara University  
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*6<sup>th</sup> Maasai Mara University International Conference*    ii

## **BACKGROUND OF MAASAI MARA UNIVERSITY**

Maasai Mara University (MMU) is located at the gateway to the world famous Maasai Mara National Reserve within the greater Mara-Mau Ecosystem. The University is in Narok Town, approximately two kilometers from Town center along the Narok-Bomet Highway. Narok Town, approximately 143 kilometers west of Nairobi City, is in the Southern part of the Kenyan part of the Rift Valley. The University is the successor to Narok University College (NUC), which started in 2007 as a college campus of Moi University. The College took over the then existing Narok Teachers Training College. NUC was later established as a constituent college of Moi University by the Narok University College Legal Order No. 101 of 2008. On 11th February, 2013 NUC was awarded a Charter and renamed Maasai Mara University.

### ***ISO Certification***

Maasai Mara University is ISO 9001:2015 Certified. The University continues to maintain its certification through a raft of internal Audits carried out by Internal Auditors and periodic Surveillance Audits by the Certification Body KEBS. The quality Audits provide a feedback on the performance of the Quality Management System, the feedback obtained is further used for continued improvement.

**An ISO 9001:2015 Certified Institution**



## ***Our Vision***

"To be a World Class University committed to academic excellence for development."

## ***Our Mission***

"To provide Quality University Education through innovative teaching, research and consultancy services for development."

## ***Core Values***

Excellence

Professionalism

Teamwork

Creativity and Innovativeness

Transparency and Accountability

Equity and Social Justice

## ***University Niche***

Environmental Resource Management  
and Conservation



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## WELCOMING REMARKS

### MESSAGE FROM THE UNIVERSITY COUNCIL CHAIR



**Dr. Kennedy Ole Kerei, PhD**  
**Chair, University Council**

It gives me great pleasure and pride to participate in today's great auspicious occasion, *The Maasai Mara University 6<sup>th</sup> International Scientific Conference of June 2021*. Most importantly, this conference is the first virtual conference we have ever held in this University. The theme of the conference is: **Research and Innovation: Infrastructural Preparedness for Emerging Global Challenge**.

On behalf of the University Council, I take this opportunity to thank the conference organizers, our partners, the members of academia, participants, researchers, students and other university community members for conducting research for presentation, publication and global dissemination. The University Council supports and takes great pride in this international conference.

Ladies and gentlemen, the 21st Century has experienced dynamic challenges including pandemics, the latest being the ongoing COVID-19 that has significantly threatened to wipe out humanity and has devastated all sectors of human life. Research and innovation are called upon to give the world solutions to the myriad challenges.

Over and above the aforementioned pandemics, the world order is under the threat of climate change, global terrorism, political upheavals, sinking economies, ruined societal moral fabrics and unfulfilling education systems. Sustainable Development Goals (SDGs), which are yet to be realized, were mooted as a panacea to the problems. Kenya has domesticated these SDGs amongst other global treatise. We have in place national blueprints such as the Kenya Vision 2030 and the current Big 4 Agenda focusing on Manufacturing, Health, Food Security and Housing. However, the real solution lies with research and innovation to enable Kenya and the World at large to surmount the ever emerging challenges.

This conference should gather, critique and disseminate information which can address existing and emerging global challenges and turn them around into opportunities for prosperity. The generated knowledge will inform policy to support global and national interventions that will turn around societal, environmental, technological and economic challenges into opportunities for economic growth and development.

May I take this opportunity once again to thank the conference planners, researchers, participants, our partners and the entire Maasai Mara University fraternity for thinking about and actualizing this important conference. I wish you fruitful and fulfilling deliberations.

Thank you

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## MESSAGE FROM THE VICE CHANCELLOR

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**Prof. Kitche Magak, PhD**  
**Ag. Vice Chancellor: Maasai**  
**Mara University**

Maasai Mara University has a history of organizing and hosting international conferences since the year 2014. This year we are delighted to host the 6th international conference on the theme **Research and Innovation: Infrastructural Preparedness for Emerging Global Challenges**. This conference comes at a time that the world is facing unprecedented challenges posed by the novel covid-19 pandemic.

COVID-19 pandemic has demonstrated that magnificent infrastructure is not the only requirement in provision of quality university education. Technology supported learning has emerged as a dependable strategy to mitigate total disruption of academic enterprise and thus the need to bring scholars and researchers together in a conference on the above mentioned theme.

Participation in this conference is a vital element in academic culture and experience, which is an important discourse between knowledge producers and consumers as they provide the opportunity to researchers to present research findings, network and gain experience and knowledge from a wide range of sources. The capacity of a university to create an environment for interaction such as this is crucial as the university is one of the few open spaces where minds and thoughts are still open and unpredictable.

The theme of the conference reflects the current engagement in global discourse on the effects of Covid-19 in the worlds educational sphere. The numerous sub-themes underpin the nature of current research being undertaken so as to inform policy issues during the pandemic.

I take this opportunity to welcome all participants to this great event in the calendar of Maasai Mara University. This is a chance to showcase new knowledge and research findings that should go a long way to improving the quality of life for mankind as well as chart new frontiers in research. In the face of the challenges brought about by the COVID-19 pandemic, I urge all to embrace the deployment of digital technology-enabled channels of communication to continue the set traditions of research, innovation and knowledge dissemination.

Finally, on behalf of the Maasai Mara University community, I wish to acknowledge the presence of all the contributors and participants in this conference.



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## MESSEGE FROM THE DVC (ACADEMICS & STUDENTS AFFAIRS)

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**Prof. Godrick Bulitia, PhD  
DVC (Academics &  
Students Affairs)**

I take this opportunity, on behalf of the Academic and Students Affairs division of Maasai Mara University, to welcome you to this University and this 6<sup>th</sup> International Virtual Conference. In hosting this Conference, the University is playing its role of not only disseminating knowledge but also effectively participating in the creation of the same. Our societies currently encounter myriad challenges. It is our rightful duty, therefore, to contribute towards alleviation of societal difficulties and this is only possible through

scientifically researched knowledge.

For instance, as we grapple with COVID-19 pandemic and its effects, we must not lose sight of other related issues affecting our societies. Every day, in the continent of Africa and the world at large, populations require interventions that would better their lives and turn around their situations. Hence, the need for integration of governments, policymakers, researchers and scholars from universities and other like-minded institutions to provide solutions to these problems cannot be over-emphasized. I am, therefore, glad to note that this Conference is aligning itself to tackle matters on *“Research and Innovation Infrastructural Preparedness for Emerging Global Challenges”*. It is only through concerted efforts that we shall become impactful in our endeavours to better mankind.

As this Conference takes off, I urge all of us to go beyond the excellent presentations and turn many of them into policies that can be implemented. As scholars, we are aware of the various institutions, nationally and internationally, dedicated and willing to fund competitive and winning proposals that would cause an impact in the society in a major way. I, therefore, urge all of us to think beyond our research findings and foresee endeavours culminating into policies that shall empower our citizen.

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## MESSEGE FROM THE DVC (ADMINISTRATION, FINANCE & PLANNING)

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**Dr. James S. Nampushi, PhD,  
MKIM  
DVC (Administration,  
Finance & Planning)**

Welcome to Maasai Mara University for the 6<sup>th</sup> International Conference, 2021 on Research and Infrastructural Preparedness for Emerging Global Challenges. This is a special University that is strategically located between the Great Maasai Mara Game Reserve, a world wonder and the Maasai Mau Forest Complex, a water tower in this country.

First and foremost, I want to thank all the Maasai Mara University 6<sup>th</sup> International Conference organizers for inviting me to give my remarks in this conference. The conference is expected to not only provide a platform for researchers and postgraduate students but also to our people in the industry. The theme

particularly, opens up to make a whole thinking around new innovations, and then translating them into solutions to challenges facing the world like the current Covid19 pandemic, the global economic crisis, as well products and services. This is only possible by the gathering that is here, who have come to share knowledge and discoveries from their areas of expertise.

The Division will continue playing the important role in coordinating Administration, Finance and Planning activities in the University which are crucial in the implementation of the core mandate of the University of innovative teaching, research and consultancy services for development. As one of Kenya's Public Universities, Maasai Mara University will continue to remain competitive and relevant by offering quality technical academic programmes and research activities with a special focus to its niche areas.

Maasai Mara University's 2019–2024 Strategic Plan addressed eight strategic focus areas, among them numbers; (3) To promote quality teaching, learning and training, (4) To foster a culture of research, innovation and technology development, (5) To expand institutional infrastructure, (8) Maintain and enhance ICT infrastructure. Through this Strategic Plan and other governing documents and policies, the University is determined to strengthen and sustain its financial support teaching research and invest more on industry collaboration and consultations.

Ladies and gentlemen, I wish you all a fruitful discourse in the conference here at Maasai Mara, feel at home and God bless you all. Thank you.

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## MESSAGE FROM THE CHAIRMAN SCIENTIFIC CONFERENCE ORGANIZING COMMITTEE



**Prof. Romulus Abila, PhD**

The COVID-19 pandemic has brought about fundamental and perhaps irreversible shifts in human – environment interactions. This paradigm shift in the way humans human interact with the natural environment has called for the need to develop innovative, low cost and environment friendly means of adapting to an increasingly changing bio – physical environment. The 6<sup>th</sup> Maasai Mara University International Scientific has been organized against this background with the overall objective of bringing together

researchers, students, policy makers and other sustainable development stakeholders to deliberate on research and innovation infrastructural preparedness for emerging challenges.

The conference deliberations are organized along three themes of tourism and Hospitality, Education and resilience to environmental shocks in health, natural Resources, economic systems and is expected to provide a forum for experts to re-evaluate and interpret their research findings in light of the new norm brought by the COVID 19 pandemic and advance scientific thinking that will be instrumental in developing and implementing sustainable solutions to current and emerging human development challenges. I am happy to note interest that has been shown on this conference as manifested by over 120 scientific and 2 extended area of interest evening presentations.

Another first about this conference is that it is running entirely online. This has presented the University with an excellent opportunity to showcase its preparedness to leverage on technology to seamlessly ensure continued University operations in face of unprecedented challenges.

On behalf of the scientific organizing committee I heartily welcome all presenters and wish all three days of productive academic engagements.

Karibuni!

## MESSAGE FROM THE DIRECTOR, RESEARCH & INNOVATION



**Dr. Aloys Osano, PhD**  
**Director Research & Innovation**

Dissemination of research and innovation findings is an essential part of research, without which any research is rendered incomplete. By disseminating research findings, new challenges arise and a forum for cross-examining, criticizing, interrogating and improving the findings is attained. Several research outputs such as conference book of abstracts, journal articles and registered intellectual Property (IP) rights are initiated. There have been new and evolving global challenges in all spectra of humankind thus warranting newer research and innovation methods. New trends in research and innovation require new infrastructure to support, including

their dissemination methods. It is for these noble reason that The 6<sup>th</sup> Maasai Mara University International e-Conference has been organized.

The Research and Innovation Directorate is envisaged as a key arm of universities with a huge potential to generate revenue (through grants, consultancies or commercialized Intellectual Property Rights, IPRs) as well as foster for global visibility. The role of the research division in universities cannot therefore be ignored and needs to be amplified vehemently. From the contemporary government capitation to universities, there is need for more money to sustain university roles and mandates.

Maasai Mara University is centrally located in a rich niche of research ecosystems. These ecosystems range from tourism and wildlife, agriculture, geology, environmental pollution, trade and culture. The University niche and sub-niches are also well in tandem with national and global development blueprints such as SDGs. These foci have guided the University towards formulation of vibrant research activities. The Directorate is particularly keen on the following activities;

- i. Streamlining and harmonizing research activities within the university through creation of an enabling environment and research policies that are ratified with national and global blueprints.
- ii. Training and empowering academic staff and postgraduate students on research activities
- iii. Creation of vibrant research groups and connecting them with relevant partners and collaborators to apply and secure grants
- iv. Establishment of a regional research facility
- v. Increase intellectual property outputs and subsequent commercialization of IPs leading to more revenue generation, employment opportunities and solving community problems
- vi. Increase IP awareness in the university through development of the 2<sup>nd</sup> generation IP policy, organizing IP workshops to train innovators and establishment of;

- a) A Technology transfer office (TTO) – the office will regulate the framework for smooth transfer of researched and patented materials into revenue to the outside community and industrial partners.
- b) An IPRs office – the office will act as a link for university innovators and the external IPR community including KIPI, KENIA, NRF, NACOSTI, ARIPO and WIPO.
- c) An innovation incubation centre – the centre will serve to nurture innovative ideas that are registered for patenting into business start-ups and industrial spinoffs.
- d) A consultancy office – to regulate consultancy services undertaken by the University staff.

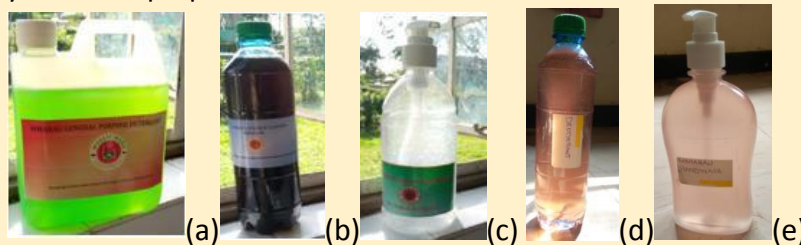
Research frameworks, policies, guides, tools and templates have been prepared to streamline operationalization of these activities. While the research policy is almost being operationalized, the following policies are being prepared;

- i. Innovation and incubation policy
- ii. Consultancy policy
- iii. Technology transfer policy

Mobilization and development of students and staff research capacity is well on course. This is done through school conferences and workshops, trainings on writing fundable proposals and creating of research groups. The Directorate has also been receiving, populating and helping to establish and initiate responses for calls for proposals. All these modalities continue to make research division more vibrant.

During the covid-19 era, the Directorate has responded by preparing several sanitation products thus saving The University on money and time used in procuring these products. The products include; Hand sanitizers, Hand wash solutions, Broad spectrum detergents, Surface deoderants, Man-hole descalors and Fumigants

These industrial products are start-ups resulting from The Directorates IPs and a commercialization strategy to guide their commercialization to the immediate community has been prepared.



Sanitation products prepared by The Directorate of Research and Innovation meant to mitigate covid-19 i.e (a) broad spectrum detergent, (b) descalors, (c) hand sanitizer, (d) surface deoderants and (e) hand wash detergents



## **CONFERENCE PREPARATION COMMITTEE**



1. Prof Romulus Abila – Chair (Director, Board of Post-Graduate Studies)
2. Dr. Aloys Osano – Secretary (Director, Research and Innovation)
3. Mr. Moses Nooseli – Head of Department, ICT
4. Mr. Anil Kumar – Director, e-learning
5. Mr. Reson Lankeu – Director, Marketing, Linkages and Collaborations
6. Mrs. Nancy Kimile – Ag University Librarian
7. Dr. Stella Kirui – Dean, School of Pure, Applied and Health Sciences
8. Dr. Beatrice Manyasi – Dean, School of Education
9. Dr. Erick Fwaya – Dean, School of Tourism, Hospitality and Natural resources
10. Dr. Benard Kodak – Dean, School of Arts, Humanities, Social Sciences and Creative Arts
11. Dr. George Rukaria – School of Business and Economics
12. Secretariat (from Directorate of Research & Innovation)

## **CONFERENCE SUB COMMITTEES**



### **Budget Sub-committee**

1. Dr. Erick Fwaya – Chair (Dean, School of Tourism, Hospitality and Natural resources)
2. Dr. Aloys Osano – Secretary (Director, Research and Innovation)
3. Dr. George Rukaria – School of Business and Economics
4. Mr. Anil Kumar – Director, e-learning
5. Secretariat (from Directorate of Research & Innovation)

### **ICT, Media and Publicity sub-committee**

1. Mr. Reson Lankeu – Chair (Director, Marketing, Linkages and Collaborations)
2. Dr. Aloys Osano – Secretary (Director, Research and Innovation)
3. Dr. Benard Kodak – Dean, School of Arts, Humanities, Social Sciences and Creative Arts
4. Dr. Beatrice Manyasi – Dean, School of Education
5. Mrs. Nancy Kimile – Ag University Librarian
6. Mr. Anil Kumar – Director, e-learning
7. Mr. Moses Nooseli – Head of Department, ICT
8. Secretariat (from Directorate of Research & Innovation)

### **CONFERENCE EDITORIAL BOARD**

1. Dr. Benard Kodak – Chair
2. Mrs. Nancy Kimile – Secretary
3. Mr. Moses Nooseli
4. Dr. Aloys Osano

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**GUEST SPEAKER**



**Professor Karla Aileen Boluk,  
University of Waterloo,  
Canada**

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Karla A. Boluk is an Associate Professor in the Department of Recreation and Leisure Studies at the University of Waterloo, Canada. Guided by a social justice paradigm and feminist ethics of care lens the broad goals of her research program are to examine ways tourism enhances the well-being and quality of life of those involved in or affected by tourism. Dr. Boluk’s critical sustainable tourism scholarship pursues interconnecting approaches. Her work has mutually challenged and critiqued the United Nations Sustainable Development Goals, as well as considered the global framework to better understand how tourism may progress sustainability efforts. Dr. Boluk is currently leading a SSHRC Grant exploring the role tourism social entrepreneurs play in progressing sustainability and the SDGs.

## KEYNOTE SPEAKERS

### Sub-theme 1: Tourism, hospitality and leisure in a post-pandemic world



**Professor Tom Baum,  
University of Strathclyde,  
Scotland**

Tom Baum is a Professor of Tourism Employment and formerly Head of the Department of Work, Employment and Organisation (2014-2019) in the University of Strathclyde in Glasgow. He was previously Head of The Scottish Hotel School in Strathclyde from 1998-2004 and 2008-2009. He is internationally recognized as a specialist in social dimensions of work and employment, including labour mobility and migration with a particular focus on the tourism and hospitality industries. Tom trained in education and pedagogy and holds BA (Hons) and MA degrees in Education from the University of Wales, an MPhil in Educational Development from Nottingham Trent University and holds two doctorates (PhD and DLitt) in tourism/hospitality employment policy studies from the University of Strathclyde. He has worked in about 50 countries as researcher, teacher and consultant and has completed projects funded by key international agencies including the World Bank, ILO, UNICEF, UNWTO, UNDP, EU, COMCEC and ADB. Tom has supervised about 40 PhD students to completion and examined over 100 doctoral theses. He is author of over 100 books and 200 scientific papers in the field of tourism and hospitality employment.

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**Sub-theme 2: Building resilient systems to respond to environmental shocks in health, agriculture, natural resources and economic systems**

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**Dr. Gladys Kalema-Zikusoka,  
Conservation Through Public  
Health (CTPH)**

Dr. Gladys Kalema-Zikusoka is Founder and CEO of Conservation Through Public Health (CTPH) ([www.ctph.org](http://www.ctph.org)), an award winning NGO that protects endangered gorillas and other wildlife through One Health approaches. CTPH's most recent award is the 2020 Saint Andrews Prize for the Environment.

After graduating from the Royal Veterinary College, University of London, in 1996, she established Uganda Wildlife Authority's first veterinary department. In 2003, she completed a Zoological Medicine Residency and Master in Specialized Veterinary Medicine at North Carolina Zoological Park and North Carolina State University. In 2015, she founded Gorilla Conservation Coffee to support farmers living

around habitats where gorillas are found.

Dr. Kalema-Zikusoka is a National Geographic Explorer, Ashoka Fellow and Mulago Foundation Henry Arnhold Fellow. She has won the 2008 San Diego Zoo Conservation-in-Action Award, 2009 Whitley Gold Award; 2011 WINGS Women of Discovery and Exploration Humanity Award, 2017 President of Uganda's Golden Jubilee Award for her contribution to the nation as a conservationist and veterinarian, 2018 Sierra Club EarthCare Award, 2019 Finalist for the Tusk Award for Conservation in Africa, 2020 Uganda Veterinary Association World Veterinary Day Award and 2020 Aldo Leopold Award for Mammologists.

She is on the leadership council of Women for the Environment - Africa, Vice President of the African Primatological Society and served on the boards of Uganda Wildlife Authority, Uganda Wildlife Education Centre, Buganda Heritage and Tourism Board. She is on the Board of Bwindi and Mgahinga Conservation Trust, Wildlife Clubs of Uganda and The Gorilla Organization



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**Sub-theme 3: Adapting to the new normal in the academic environment:  
challenges, prospects and opportunities**

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**Prof. Patricia Forbes,  
University of Pretoria and  
Rand Water Chair**

Patricia Forbes is a Full Professor in Analytical Chemistry at the University of Pretoria and holds the Rand Water Chemistry Research Chair. Her research focuses on the development of novel sampling and analytical methods for environmental pollutants. This includes novel denuder based sampling techniques which allow for simultaneous sampling of gas and particle phase organic air pollutants; the use of lichens as biomonitors of inorganic and organic air pollutants; and the development of quantum dot nanomaterials for fluorescence sensing of emerging chemical pollutants (such as pharmaceuticals and pesticides) in water. Prof

Forbes has given over 40 invited presentations on her research and she has published over 75 journal papers and 10 book chapters. Prof Forbes was awarded the prestigious 2019 ChromSA Chromatographer of the Year award in recognition of her research achievements. She was the recipient of the Chemical Education award of the South African Chemical Institute (2014), the Wharton QS Reimagine Education Award for Presence Learning (2015) and the University of Pretoria Teaching Excellence and Innovation Laureate award (2016). Patricia is a Fellow of the South African Chemical Institute (SACI) and she served on the Executive of SACI from 2011 to 2015, and was Chairperson of ChromSA, the chromatography division of SACI, from 2009 to 2015 and again from 2019 - 2021. Prof Forbes is a Fellow of the Royal Society of Chemistry (RSC). She serves as an elected member on the RSC Professional Standards Board and she chairs the RSC Local Section South Africa, North committee. In addition, Prof Forbes serves as an expert for the International Organization for Standardization (ISO) regarding the monitoring of organic vapours in workplace environments and on the editorial boards of four international chemistry journals.

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**THE 6<sup>TH</sup> MAASAI MARA UNIVERSITY INTERNATIONAL CONFERENCE**  
**28<sup>TH</sup> - 30<sup>TH</sup> JUNE, 2021**  
**CONFERENCE PROGRAMME**

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\*Time given as per East African Time Zone

\*The links are Active; press Ctrl + click to activate them

**MONDAY, 28<sup>TH</sup> JUNE 2021**

TIME	ACTIVITY	FACILITATOR
<b>CONFERENCE PRELIMINARIES</b> (Main Link: <a href="https://meet.google.com/ywh-sipg-run">https://meet.google.com/ywh-sipg-run</a> )		
8:20 AM 8:40 AM	Participants Sign in/ Delegates arrival and registration	Conference Secretariat/ Marketing Officials
8:40 AM 8:45 AM	Opening Prayers	Volunteer 1
8:45 AM 9:00 AM	University, Kenya & East African Anthems	Director, Research & Innovation
9:00 AM 9:20 AM	Introduction of Participants	Director, Research & Innovation
9:20 AM 9:25 AM	Online Group Photos	Mr. Anil Kumar
9:30 AM 9:40 AM	Physical Group Photo for physical members (Live coverage to online members)	Mr. Mzalendo Kemboi
9:40 AM 9:50 AM	Tree Planting for physical delegates (Live coverage to online members)	Estates, Mr. Mzalendo Kemboi
9:50 AM 10:00 AM	Entertainment & Adverts (Live coverage to online members)	ICT
	Tea Break for Delegates & Organizers	Catering & Hospitality

<b>WELCOMING SPEECHES / OPENING SPEECHES</b> (Main Link: <a href="https://meet.google.com/ywh-sipg-run">https://meet.google.com/ywh-sipg-run</a> )						
10:20 AM 10:30 AM	Welcoming Remarks		Prof. Romulus Abila, Chair, Conference Committee			
10:30 AM 10:50 AM	Welcoming Remarks		Dr. Aloys Osano, Director, Research & Innovation			
10:50 AM 11:20 AM	Innovation infrastructural preparedness for emerging Global Challenges		Dr. Tony Omwansa, CEO, Kenya National Innovation Agency (KENIA)			
11:20 AM 11:35 AM	Research, Innovation, Administration & Finance in Universities		Dr. James S. Nampushi, Ag. DVC (AFP)			
11:35 AM 11:50 AM	Research, Innovation & Academics in Universities		Prof Bulitia Godrick, DVC (AS&A)			
11:50 AM 12:10 AM	Speech		Prof Kitche Magak, Ag. VC			
12:10 PM 12:30 PM	Speech		Dr. Kennedy Ole Kerei, Council Chair			
12:30 PM 1:00 PM	Guest Speaker		Prof Karla Aileen Boluk, University of Waterloo, Canada			
<b>1:00 PM 1:50 PM</b>	<b>LUNCH BREAK</b>		<b>Catering &amp; Hospitality</b>			
<b>SUB-THEME 1: TOURISM, HOSPITALITY AND LEISURE IN A POST-PANDEMIC WORLD –</b> (Room 1/Link 1: <a href="https://meet.google.com/jkp-cocz-twj">https://meet.google.com/jkp-cocz-twj</a> )						
2:00 PM 2:30 PM	Sub-theme 1 Keynote Speaker		Prof. Tom Baum of Strathclyde University, Scotland			
2:30 PM 2:40 PM	Q/A Session for Keynote Speaker		Dr. Erick Fwaya			
	Session 1 – Tourism & Hospitality (Room 1/Link 1: <a href="https://meet.google.com/jkp-cocz-twj">https://meet.google.com/jkp-cocz-twj</a> )	Dr. Samson Mabwoga (Moderator) ICT Support – Mark/Kibaso	Session 2 – Tourism & Wildlife (Room 2/Link 2: <a href="https://meet.google.com/ttx-cazs-fwk">https://meet.google.com/ttx-cazs-fwk</a> )	Mr. Moses Muraya (Moderator) ICT Support – George/Patrick	Session 3 – Environment (Room 3/Link 3: <a href="https://meet.google.com/zr-k-cbbq-nqk">https://meet.google.com/zr-k-cbbq-nqk</a> )	Dr. Charity Konana (Moderator) ICT Support – Njoroge/Sadia

2:40 PM 2:55 PM	Community Resilience Models for conservation of cultural ecosystems services and tourism management post COVID-19 pandemic in park-adjacent communities within Aberdares National Park, Kenya	Felix Lamech Mogambi Ming'ate (Kenyatta Univ) and Shem Wambugu Maingi (Kenyatta Univ)	Role of Civil Society on Wildlife Group Conservancies Governance in Kenya	Samuel Munyi (JKUAT)	Examining The Legal Framework For The Conservation Of The Mau Forest Complex	Farida Kerubo (Egerton)
2:55 PM 3:10 PM	Application of Big Data in Positioning Products and Services by Hotels in Kenya	Fwaya V.O (Maasai Mara Univ) & Akunja L.O	Investigating the Effects of Covid-19 pandemic on Narok County's Tourism and Hospitality Sectors	Morompi Ole Masago (Maasai Mara Univ.)	Assessment Of Climate Variability In Kenya And Its Implications On Food Security: The Case Of Kisii County, Kenya.	Patrice Morang'a (Maasai Mara Univ), Romulus Abila & Solomon Mabwoga
3:10 PM 3:35 PM	Transformational Leadership and Competency Development in Tourism and Hospitality Training Institutions in a Post-corona virus Pandemic in Kenya	Wilson Chelimo (JKUAT)	Devolved Governance Systems Enhancing Youth Participation in Wildlife Conservation in a Post-Covid 19 Pandemic in Kenya	Muya Ngigi Moses (JKUAT)	Prioritization of Loita Maasai medicinal plants for conservation	Jedidah Nankaya (Maasai Mara Univ), Anil Kumar, James Nampushi & Henrik Balslev
3:35 PM 3:50 PM	Effect of Time-Based Conflict on Employee Productivity: Does Altruism Matter? A	Barsulai C. Stella (University of Eldoret) Fwaya V.O Erick	Role of Board of Directors on Performance of Tour Firms Operating in Maasai Mara National	Mariam Moige Muhando (JKUAT)	Impacts of Non-revenue water loss on water quality, quantity and the environment	Teresa Onyango (Rongo University)

	Reflection from star-rated Hotels in Kenya	(Lecturer, MMARAU)	Reserve in a Post-Covid 19 Pandemic in Kenya			
3:50 PM 4:05 PM	Commercial Break			ICT ( <i>George Kamweru</i> )		
4:05 PM 4:20 PM	Effects of Covid-19 pandemic on Tourism and Hospitality Industry Operations in Narok County	Koila T (Maasai Mara University), Rianto N, Serem W, Gudda P	Effect of covid-19 pandemic on Kenya's hospitality sector: A market analysis trend	George Ariya (University of Eldoret) & Catherine Sempele	Potential For Roof Rainwater Harvesting To Provide Cost Effective And Environmentally Sustainable Source Of Handwashing Water At Maasai Mara University.	Milton Kaaria (Maasai Mara Univ), Romulus Abila, Ann Nairuko & Paul Sankale
4:20 PM 4:35 PM	Factors Influencing Public Participation in Environmental Impact Assessment of the Proposed RUAI Sanitary Landfill Project in Nairobi City County, Kenya	Patrick Owiny, Jones Agwata (University of Nairobi) & Kariuki Muigua	The Impact of COVID 19 on Environmental Conservation	Konana Charity (Maasai Mara Univ) & Dr Motochi Isaac	Extermination of <i>Parthenium Hysterophorus</i> Invasive Weed for Environmental Sustainability	Lydia Nyawira Mburia (Isiolo County Government)
4:35 PM 4:50 PM	Water Pollution Detection System	Baraka Caleb (Maasai Mara Univ.), Moses Nooseli & Abraham Mutua	Strategic Supplier Relationship on Performance of Devolved Systems of Government in Kenya	Carren Chepng'etich, Noor Shalle, Esther Waiganjo	Natural Radioactivity And External Dose Rates In Tailing Samples From Rosterman Gold Mine, Kakamega County, Kenya	Conrad Khisa Wanyama (Kibabii University), John Wanjala Makokha and Fred Wekesa Masinde
Re-convergence back to ( <b>Main Link:</b> <a href="https://meet.google.com/ywh-sipg-run">https://meet.google.com/ywh-sipg-run</a> )						



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4:50 PM 5:05 PM	End of Day 1; Summary Lessons & Remarks	Prof. Romulus Abila, Conference Chair
5:05 PM 5:10 PM	Closing Prayers	Volunteer 2
	<b>GoogleMeet Link for Fireside Chat (Main Link: <a href="https://meet.google.com/ywh-sipg-run">https://meet.google.com/ywh-sipg-run</a>)</b>	
6:00 PM 7:00 PM	<b>A Talk on The Cross Section Between Policy, Climate Change and Security among Indigenous People in Kenya</b>	<b>Dr. Ben. R. Ole Koissaba, Indigenous Concerns Resource Center</b>



TUESDAY, 29<sup>TH</sup> JUNE, 2021

**SUB-THEME 2: BUILDING RESILIENT SYSTEMS TO RESPOND TO ENVIRONMENTAL SHOCKS IN HEALTH, AGRICULTURE, NATURAL RESOURCES AND ECONOMIC SYSTEMS**

TIME	ACTIVITY			FACILITATOR		
Sub-theme 2 Preliminaries – (Main Link: <a href="https://meet.google.com/ywh-sipg-run">https://meet.google.com/ywh-sipg-run</a> )						
8:15 AM 8:20 AM	Participants sign in			ICT/ Conference Secretariat		
8:20 AM 8:25 AM	Opening Prayers			Volunteer 3		
8:25 AM 8:35 AM	Opening Remarks			Prof Romulus Abila & Dr. Aloys Osano		
8:35 AM 9:05 AM	Sub-theme 2 Keynote Speaker			Dr. Gladys Kalema – Zikusoka (Conservation Through Public Health, CTPH, Uganda)		
9:05 AM 9:10 AM	Q/A for Keynote speaker			Dr. Kirui Stella		
9:10 AM 9:15 AM	Commercial Break and Convergence of Participants to different rooms/links			ICT		
	Session 4 – Biology & Biotechnology (Room 1/Link 1: <a href="https://meet.google.com/jkp-cocz-twj">https://meet.google.com/jkp-cocz-twj</a> )	Dr. Samson Mabwoga (Moderator) ICT Support – Mark/Kibaso	Session 5 – Physics & Geophysics (Room 2/Link 2: <a href="https://meet.google.com/ttx-cazs-fwk">https://meet.google.com/ttx-cazs-fwk</a> )	Dr. Dominic Menge (Moderator) ICT Support – George/Patrick	Session 6A – Health (Room 3/Link 3: <a href="https://meet.google.com/zrk-cbbq-nqk">https://meet.google.com/zrk-cbbq-nqk</a> )	Ms. Jacqueline Naulikha (Moderator) ICT Support – Njoroge/Sadia
9:15 AM 9:30 AM	Control of <i>Erwinia</i> spp. isolated from star-of-bethlehem ( <i>ornithogalum spp.</i> ) using <i>actinomyces</i> and preparation of antiserum using rabbits	Paul Njenga Waithaka (Kirnyaga University), Eliud Mugu Gathuru, Benson Muriuki Githaiga, Silviah Wanjiru Gacau	Evaluation of Reservoir Sub Surface Structures From Pressure Transient Tests in Olkaria Domes Geothermal Field, Kenya	Solomon Namaswa (Multimedia University), John Githiri, Nicholas Mariita, Maurice K’Orowe	Preparing For The Next Pandemic: The Need To Re Evaluate The NHIF	Shem Oganga (Egerton University)

9:30 AM 9:45 AM	Fermentation Of African Nightshade With Starter Cultures To Improve Safety And Quality	Eliud N. Wafula (Bomet University/ Max Rubner-Institut (Germany), Frommherz Lara, Bernhard Trierweiler, Julius M. Mathara, Charles M.A.P. Franz, Sabine E. Kulling and Melanie Huch	A Study Of Solar Variability And Its Effects On Earth's Climate	Dorothy Museo (University of Nairobi)	Health Impacts of a Traditional Illicit Brew (Kaanga) Consumed in Meru County, Kenya	Atuna Titus Gitari (Maasai Mara University), Osano Aloys, Bakari Chaka, Bulitia Godrick
9:45 AM 10:00 AM	Developing Management Strategies against Cashew Leaf And Nut Blight	Dominic Menge (Maasai Mara Univ)	The Design and Simulation of Solar Photovoltaics Cell For Maximum Power Output Using Matlab/Simulink	Santeto Enoch Kuntai (Maasai Mara University), Okoth Steven Ochola, Sankara Aluko, Eliud Yego and Jared Ombiro Gwaro	Assessment of School-based HIV Programs Aimed at Optimizing HIV Care and ART Adherence in Kisii County Kenya	Jaqueline Naulikha (Maasai Mara University) & Betsy W.
10:00 AM 10:05 AM	Commercial Break			ICT (Isaac Kihara)		
10:05 AM 10:20 AM	Effects of Fertilizer and Fungicide Application Rates on the Incidence and Severity of Late Blight (Phytophthora	Eric Mosota Rosana (Egerton University), Alex Machio Kange, Lenah Nakhone	Exploring The Evidence For A Closed Universe: Is There A Possible Crisis For Cosmology?	Douglas Monasi (University of Nairobi)	Poor communication eats a good response strategy	Jaqueline Naulikha (Maasai Mara University) & Juliana M.

	infestans) on Irish Potatoes ( <i>Solanum tuberosum</i> L)	Wati, Daniel Otieno Otaye				
10:20 AM 10:35 AM	Isolation And Characterisation Of Probiotic Lactic Acid Producing Bacteria In Kenyan Traditionally Fermented Milk	Susan Wachira (Maasai Mara Univ), Stella Kirui & Bakari Chaka	Ab-Initio Study Of Thermoelectric Properties Of An A,B2,C2 Material For Waste Heat Recovery For An Automotive	Maera John (Maasai Mara University), George S. Manyali; James Sifuna	Antimicrobial Resistance Profiles Of Selected Enterobacteriaceae Contaminating Raw Beef From Retail Butcheries In Kakamega Town, Kenya	Lydia J. Kiptum (Kisii University), Eric O. Omwenga, and Stanslaus K. Musyoki,
10:35 AM 10:50 AM	Antimicrobial Activity of Mushroom ( <i>Agaricus Bisporus</i> ) and Fungi ( <i>Trametes Gibbosa</i> ) Extracts from Mushrooms and Fungi of Egerton Main Campus, Njoro Kenya	Paul Njenga Waithaka (Kirinyaga University), Eliud Mugu Gathuru, Benson Muriuki Githaiga and Keziah Moraa Onkoba	Estimation of CO <sub>2</sub> Emission Reduction by a PV Power Backup System in Equatorial Climate	Wilkinson Cheruiyot (University of Eldoret)	Mycobacterium Tuberculosis detection techniques on sputum in Kisii-Kenya	Grace Moraa Orina (Maasai Mara University), Jackline Naulikha and Eucabeth Jabuya
10:50 AM 11:15 AM	<b>TEA BREAK (Entertainment for virtual participants)</b>			<b>Catering &amp; Hospitality</b>		
	Session 7A – Chemistry (Room 1/Link 1: <a href="https://meet.google.com/jkp-cocz-twj">https://meet.google.com/jkp-cocz-twj</a> )	Dr. Meshack Sitati (Moderator) <i>ICT Support – Mark/Kibaso</i>	Session 7B – Chemistry (Room 2/Link 2: <a href="https://meet.google.com/ttx-cazs-fwk">https://meet.google.com/ttx-cazs-fwk</a> )	Dr. Dominic Menge (Moderator) <i>ICT Support – George/Patrick</i>	Session 6B – Health (Room 3/Link 3: <a href="https://meet.google.com/zrk-cbbq-nqk">https://meet.google.com/zrk-cbbq-nqk</a> )	Ms. Jacqueline Naulikha (Moderator) <i>ICT Support – Njoroge/Sadia</i>
11:20 AM 11:35 AM	Extraction and Characterization of Green Surfactants from Fruits of <i>Solanum Incanum</i> and <i>Solanum Aculeastrum</i>	Stephen Mutinda (Kapa Oil Refineries) & Aloys Osano	Analysis of the Catalytic Behavior of <i>Osyris Alba</i> Bark and <i>Indigofera Amabelacensis</i> Leaves Extract in	Maxwel Gitonga (Maasai Mara University) , Aloys Osano, Bakari Chaka	Nurses' knowledge regarding intravenous fluid therapy at a County hospital in Kenya	Winfridah Njunge (Maasai Mara University)



			Ethanoic and Lactic Fermentation			
11:35 AM 11:50 AM	One-pot synthesis of Novel isoxazoline, pyrazoles, bypyrimidine and Oxime templates and their antimicrobial activity	Evans Okemwa Kenanda (Lecturer, Kisii University)	The influence of Bomet red rock powder on composite organic fertilizers prepared from <i>Tithonia diversifolia</i> leaves and <i>Musa acuminata</i> (banana) stalks	Abdallah Marjan (Maasai Mara University), Bakari Chaka, Evans Suter, Aloys Osano	Microbial Analysis of Common Selected <i>Enterobacteriaceae</i> Contaminants of Raw Beef Sampled from Selected Retail Butcheries in Kakamega Town, Kenya	Lydia J. Kiptum (Maasai Mara University) & Nathan Oyaro
11:50 AM 12:05 PM	Time-course analysis of chemical and physical properties of organic fertilizer from <i>Tithonia diversifolia</i> leaves	Omondi Fredrick (Multimedia University), Bakari Chaka, Evans Suter, Aloys Osano	Characterization and Evaluation of Antifungal and Phytochemical Activities of <i>Senna Didymobotrya</i> Leave Extracts	John Muiru (Maasai Mara University), Aloys Osano, Bakari Chaka	Treatment Compliance Among Women With Pregnancy Induced Hypertension Attending Selected Health Facilities In Rachuonyo North Sub-County, Homabay County, Kenya	Eucabeth Jabuya (Maasai Mara Univ) & Grace Orina
12:05 PM 12:10 PM	Commercial Break			ICT (Mark Anyanga)		
	Session 7C – Chemistry (Room 1/Link 1: <a href="https://meet.google.com/jkp-cocz-twj">https://meet.google.com/jkp-cocz-twj</a> )	Dr. Meshack Sitati (Moderator) ICT Support – Mark/Kibaso	Session 8 – Statistics (Room 2/Link 2: <a href="https://meet.google.com/ttx-cazs-fwk">https://meet.google.com/ttx-cazs-fwk</a> )	Dr. Dominic Menge (Moderator) ICT Support – George/Patrick	Session 9A – Food Security (Room 3/Link 3: <a href="https://meet.google.com/zrk-cbbq-nqk">https://meet.google.com/zrk-cbbq-nqk</a> )	Dr. Charity Konana (Moderator) ICT Support – Njoroge/Sadia
12:10 PM 12:25 PM	Synthesis and characterization of aluminium oxide nanoparticles from	Mercy Nduni (Maasai Mara University) & Aloys Osano	Efficiency Test Between MLE And MDE Fitting Techniques.	Kelvin Okumu Otieno (Maasai Mara University)	Performance Appraisal Practice Opportunity And Employee Retention In Selected	Sylvia Chumo (JKUAT)

	waste aluminium foil and potential application in aluminium-ion cell				Beverage Processing Firms In Kenya	
12:25 PM 12:40 PM	Extraction and Characterization of <i>Zanthoxylum chalybeum</i> Crude Extract for Phytochemicals and Elemental Analysis	Georgina Masakhwe (Maasai Mara University), Evans Suter & Aloys Osano	Triangulation Analysis of the Effect of Taxation Policy on Revenue Collection Performance by Kenya Revenue Authority	Antony Wahome Ndirangu (JKUAT), Willy Muturi and Dr. Patrick Ngumi	Influence Of Post-Harvest Technology On Food Security In Narok East Sub-County, Kenya	Lawrence Asige (Maasai Mara University) & Dennis Omuse
12:40 PM 12:55 PM	Characterization of Bio-active Compounds Essential for Blood Coagulation in the Crude Extracts of <i>Tradescantia zebrina</i> , <i>Tagetes minuta</i> and <i>Codiaeum variegatum</i> Leaves	Grace Gakuo, Aloys Osano, Bakari Chaka	Fitting Wind Speed To A Probability Distribution Using Minimum Distance Estimation Technique	Kelvin Okumu Otieno (Maasai Mara University)	Influence Of Freight Management On Performance Of Food And Beverage Manufacturing Firms In Kenya	Naomy Jepchumba (JKUAT)
12:55 PM 1:05 PM	Extraction and Characterization of Natural Pesticides from Extracts of <i>Lippia javanica</i>	Daniel Githua, Aloys Osano & Bakari Chaka	GC-MS Analysis of <i>Vernonia thomsoniana</i> Extracts and Antibacterial Potentiating Effects on standard Antibiotics	Abubakar Babando (Ahmadu Bello University, Zaria, Nigeria) Aliyu, Patience Gangas, Hamisu Ibrahim, Adebayo Ojo Oyewale and Kehongo	Post-harvest Practices of Maize Farmers in Trans Nzoia, Kisii, Kisumu, Bungoma, Migori, Kericho, Machakos, Kitui and Meru Counties, Kenya and isolation of mycotoxin producing fungi from maize samples	Mwanicha S. N. Okioma (Egerton), Eliud Mugu Gathuru, Isabel Nyokabi Wagara, Paul Njenga Waithaka and Benson

				Moses Nyanguru		Muriuki Githaiga
<b>1:05 PM 1:50 PM</b>	<b>LUNCH BREAK (Entertainment for virtual participants)</b>			<b>Catering &amp; Hospitality</b>		
	Session 10A – Supply Chain & Procurement (Room 1/Link 1: <a href="https://meet.google.com/jkp-cocz-twj">https://meet.google.com/jkp-cocz-twj</a> )	Mr. Job Ogada (Moderator) <i>ICT Support – Mark/Kibaso</i>	Session 11A – Finance (Room 2/Link 2: <a href="https://meet.google.com/ttx-cazs-fwk">https://meet.google.com/ttx-cazs-fwk</a> )	Dr. Patrick Gudda (Moderator) <i>ICT Support – George/Patrick</i>	Session 9B – Food Security (Room 3/Link 3: <a href="https://meet.google.com/zrk-cbbq-nqk">https://meet.google.com/zrk-cbbq-nqk</a> )	Mr. Moses Muraya (Moderator) <i>ICT Support – Njoroge/Sadia</i>
2:00 PM 2:15 PM	Influence of Supplier Development on Organizational Performance in Food and Beverage Manufacturing Companies in Kenya	Bartoo Dorothy Chebichii (JKUAT)	Determinants Of Cash Flow Management Practice On Performance Of Commercial Banks In Kenya	Wilson Aggrey Ogama Kitere (JKUAT)	Breed And Social Economic Factors Influencing Smallholder Dairy Cattle Productivity In Tigania East Sub-County, Kenya	Kirea, J. Atuna (South Eastern Kenya University) and Nguluu, S.
2:15 PM 2:30 PM	Influence Of Supply Chain Resilience On The Performance Of Disaster Relief And Humanitarian Aid Organizations In Kenya	Erastus Kiswili Nyile (JKUAT), Ismail Noor Shale, Anthony Osoro	The Effect of Financial Leverage on Distress in Savings and Credit Cooperative Organizations in Kenya	Susan Jepkorir (JKUAT), Willy Muturi and James Ndegwa	Evaluation of the Efficacy of Botanical Pesticides for Fall Armyworm Control in Maize Production in Kenya.	Stella Kirui (Maasai Mara University), Megiri M.L, Oyaro N. and Kiptum L. J.
2:30 PM 2:45 PM	Influence Of Procurement Ethics On The Performance Of Devolved Systems Of Governments In Kenya	Mary Andika (Multimedia University)	Influence of Trade credit on the Growth of Small and Medium Size Manufacturing Enterprises in Rwanda	Emmaboles Rubunda (JKUAT/ Ministry of Foreign Affairs and Cooperation (Rwanda))	Opportunities and barriers to mango production and upscaling activities in the context of climate change in Elgeyo Marakwet County, rural Kenya	Koima Purity J (University of Leeds, UK) and Kirui Stella

2:45 PM 3:00 PM	Building Resilient Supply Chain Through Strategic Supplier Partnership For Food Security Realization In Kenya: Engaging Agricultural Food Authority	Fridah Chepleting (JKUAT)	Influence Of Budget Planning On Implementation Of Water Construction Projects In Bomet County, Kenya	Emmy Chelangat Rotich (JKUAT), Elegwa Mukulu and Samson Nyanga'u Paul	Isolation of fungi from maize samples collected from selected Counties in Kenya	Mwancha S. N. Okioma (Egerton) , Eliud Mugu Gathuru, Japhet Mburugu Muthamia, Paul Njenga Waithaka and Benson Muriuki Githaiga
3:00 PM 3:15 PM	Influence of supplier relationship management on performance of manufacturing firms in Kenya	Fatuma Ali Rajab (JKUAT/ Ministry of Foreign Affairs)	Effect of current assets management on financial performance of non-financial firms listed at NSE	Divinah Koech (JKUAT)	Effects of aligning strategic decision making on the sugar industry in Western Kenya	Simel Ole Sankei (Maasai Mara University), Paul Katuse & Almadi Obere
3:15 PM 3:20 PM	Commercial Break			ICT ( <i>George Kamweru</i> )		
	Session 10B – Supply Chain & Procurement (Room 1/Link 1: <a href="https://meet.google.com/jkp-cocz-twj">https://meet.google.com/jkp-cocz-twj</a> )	Mr. Job Ogada (Moderator) <i>ICT Support – Mark/Kibaso</i>	Session 11B – Finance (Room 2/Link 2: <a href="https://meet.google.com/ttx-cazs-fwk">https://meet.google.com/ttx-cazs-fwk</a> )	Dr. Patrick Gudda (Moderator) <i>ICT Support – George/Patrick</i>	Session 12 – Housing & Urban Planning (Room 3/Link 3: <a href="https://meet.google.com/zrk-cbbq-nqk">https://meet.google.com/zrk-cbbq-nqk</a> )	Dr. Sammy Mutisya (Moderator) <i>ICT Support – Njoroge/Sadia</i>
3:20 PM 3:35 PM	Sustainable Entrepreneurship Factors Influencing Performance Of Clearing And	Richard Keroti (Kenya Methodist University)	Transforming From Microfinance Institution To Microfinance Bank In Kenya? Manage	George Koome Rukaria (Maasai Mara University)	Policy Framework on mitigating building failures: A critical ingredient for safe, secure and resilient built environment in Kenya	Patrick Mwenda Bucha (Strathmore/ State Department)

	Forwarding Firms In Kenya		Institutional Change Well			for Housing and Urban Development, Joseph Odhiambo Onyango, Dennis Okello Juma
3:35 PM 3:50 PM	Effects Covid-19 on Supply Chain and Health care Product Innovations	Gudda,P. (Maasai Mara University), Gathuru, E., Gudda, K.	Covid 19 As A Driver In Behavioural Capital Investment	Wesonga E. (Maasai Mara University) & Gudda, P.	Challenges facing application of Public Private Partnerships in low cost urban housing in Kenya for a resilient housing sector	Daniel Mutegi Giti (Ministry of Transport)
3:50 PM 4:00 PM	Commercial Break			ICT ( <i>Isaac Kihara</i> )		
	Session 13 – Human Resource (Room 1/Link 1: <a href="https://meet.google.com/jkp-cocz-twj">https://meet.google.com/jkp-cocz-twj</a> )	Dr. George Rukaria (Moderator) <i>ICT Support – Mark/Kibaso</i>	Session 14 - Strategic Management & Project Management (Room 2/Link 2: <a href="https://meet.google.com/ttx-cazs-fwk">https://meet.google.com/ttx-cazs-fwk</a> )	Dr. Samson Mabwoga (Moderator) <i>ICT Support – George/Patrick</i>	Session 15 - Business Management (Room 3/Link 3: <a href="https://meet.google.com/zrk-cbbq-nqk">https://meet.google.com/zrk-cbbq-nqk</a> )	Dr. Benard Kodak (Moderator) <i>ICT Support – Njoroge/Sadia</i>
4:00 PM 4:15 PM	Influence Of Organizational Culture On Employee Outcomes: The Moderating Effect Of Human Resource Management Orientations In Kenyas’ Civil Service	Pamela Woyengo (JKUAT), Joyce Nzulwa, Romanos Odhiambo	Influence Of Project Monitoring And Evaluation Practice On Performance Of Construction Projects In Kenya	Priscah Wabuti Mwanza (JKUAT), Gregory Simiyu Namusonge & Elizabeth Nambuswa Makokha	Alignment of Organizational Structure as an antecedent to Performance	Simel Ole Sankei (Maasai Mara University), Gladys Rotich, Paul Katuse & Almadi Obere

4:15 PM 4:30 PM	Influence Of Human Factors On Revenue Maximization In Devolved Units In Kenya	William Oduol (JKUAT)	Influence of Competitive Intelligence on the Relationship between Strategy Formulation and Performance of Companies listed at Nairobi Securities Exchange, Kenya	Justus Mbevo Wathe (JKUAT), Mike Iravo, Joyce Nzulwa	Effects of COVID-19 Pandemic on Small & Middle-Income Economies (SMEs) in Developing Nations: A Case Study of Narok Town, Kenya	Morompi Ole Masago (Maasai Mara University)
4:30 PM 4:45 PM	Investigating The Effectiveness of Recruitment And Selection Methods In Contemporary Public Sector Organizations: A Case Of Narok Level Four County Hospital	Christabel Lubunga (Maasai Mara University), Sankel Simel & Belinda Kisia	Does Performance Contracting Drive Citizen-Centric Service Delivery? The Case Of Huduma Centres' In Western, Kenya	Wesonga Justus Nyongesa (Maasai Mara University)	Role of Interest Rate Regulation In Explaining Economic Growth In Kenya	Nicholas Apamo Owino (Maasai Mara University)
4:45 PM 5:00 PM	Determinants Of Financial Performance Of Micro Finance Institutions In Kenya	Sungwacha Mulianga Stephen (Kibabii University)	Communication Planning And Implementation Of Water Construction Projects In Bomet County, Kenya	Emmy Chelangat Rotich (JKUAT), Elegwa Mukulu and Samson Nyanga'u Paul	Sustainable Supply Chain Practices and Competitive Advantage In The Horticultural Sector In Kenya	Mary Mumbi Kariuki, Patrick Karanja Ngugi & David Kiarie Mburu
5:00 PM 5:05 PM	Commercial Break			ICT (Mark Anyanga)		
5:05 PM 5:20 PM	Effect Of Athlete Expertise On Brand Endorsement In Manufacturing Companies In Kenya	Anthony Juma Wagoki (JKUAT)	Human Resource and Competitiveness of Large Manufacturing Companies in Kenya	Peter M. King'oina (JKUAT), J.O. Akicho & C.J. Mairura	The Relationship Between Green Bonds, Interest Rate And Financial Performance Of Banks And	Philip Ngunjiri (JKUAT)



					Investment Firms Listed In The Nairobi Securities Exchange In Kenya	
5:20 PM 5:35 PM	Investments In Technological Innovation and Financial Performance of Small Scale-Tea Industries In Kenya	Vicky Obanyi Mobegi (JKUAT), Tabitha Nasieku, Samuel Obino Mokaya & Bichanga W. Okibo	Workforce Diversity and Employee Performance In The Constitutional Commissions Of Kenya	Lemunen, Solomon (JKUAT), Susan Were, Gregory Namusonge	Public Participation in Contract Administration for Sustainable Procurement Management in Devolved System of Governments in Kenya	Eunice Gitiri Njagi (JKUAT), Gregory S. Namusonge, Noor Ismail Shale
5:35 PM 5:50 PM	Relationship Between Supplier Relationship Management and Implementation Level Of Public Procurement Regulatory Framework In The Devolved Governments In Kenya	Denis Ateto Matunga, Patrick Karanja Ngugi & Romanos Odhiambo	Moderating Effect of Environmental Uncertainties on the Relationship between Risk Hedging Supply Chain Strategy and Performance of Manufacturing Firms in Kenya	Karani Anthony Muriithi (JKUAT), Odari Sammy & Noor Shalle	Relationship Between Career Management Strategies And Employee Performance In State Corporations In Kenya	Waweru, Florence Wangeci, Were, Susan, Namusonge, Gregory
5:50 PM 5:55 PM	Commercial Break			ICT (Mark Anyanga)		
	Re-convergence back to (Main Link: <a href="https://meet.google.com/ywh-sipg-run">https://meet.google.com/ywh-sipg-run</a> )					
5:55 PM 6:10 PM	End of Day 2; Summary Lessons & Remarks			Prof. Romulus Abila, Conference Chair		
6:10 PM 6:15 PM	Closing Prayers			Volunteer 4		

WEDNESDAY, 30<sup>TH</sup> JUNE, 2021

TIME	ACTIVITY			FACILITATOR		
<b>Sub-theme 2 Preliminaries – (Main Link: <a href="https://meet.google.com/ywh-sipg-run">https://meet.google.com/ywh-sipg-run</a>)</b>						
8:15 AM 8:20 AM	Participants sign in			ICT/ Conference Secretariat		
8:20 AM 8:25 AM	Opening Prayers			Volunteer 5		
8:25 AM 8:35 AM	Opening Remarks			Prof Romulus Abila & Dr. Aloys Osano		
<b>Commercial Break and Convergence of Participants to different rooms/links</b>				<b>ICT</b>		
	Session 16 – Information Sciences (Room 1/Link 1: <a href="https://meet.google.com/jkp-cocz-twj">https://meet.google.com/jkp-cocz-twj</a> )	Dr. George Rukaria (Moderator) <i>ICT Support – Mark/Kibaso</i>	Session 17 – Social Work & Humanities (Room 2/Link 2: <a href="https://meet.google.com/ttx-cazs-fwk">https://meet.google.com/ttx-cazs-fwk</a> )	Dr. Karani Onyiko (Moderator) <i>ICT Support – George/Patrick</i>	Session 18 – Gender (Room 3/Link 3: <a href="https://meet.google.com/zrk-cbbq-nqk">https://meet.google.com/zrk-cbbq-nqk</a> )	Dr. Benard Kodak (Moderator) <i>ICT Support – Njoroge/Sadia</i>
8:40 AM 8:55 AM	Entrepreneurial Knowledge Diffusion Practice: The Role of Dissemination Networks in Innovation performance in Firms	Nandwa Musambayi (University of Eldoret)	Inspiring Civil Servants Organizational Citizenship Behaviour Through Interpersonal Justice To Build Resilient Systems To Mitigate Global Challenges In Kenya	John Chegenye (JKUAT), Dr Clive Mukanzi and Dr Julius Miroga	The Effects Of Gender Culture On Women Career Progression In A Fast Changing Environment; A Case Study Of Maasai Mara University	Jane Wanjir (Maasai Mara University), Belinda Kisia & Naikuni Daniel
8:55 AM 9:10 AM	Behavior Change Communication: The Role of Media in Kenya in the COVID-19 Era	Kabindio Brendah N. (Masinde Muliro University of Science & Technology) & Bultia Godrick M.	The Inter-Generational Global Peace Dialogue Kenya Report Held At Maasai Mara University On 12 <sup>th</sup> October 2019, Narok County.	Wilson Waweru Mungai (Maasai Mara University)	Effects of Covid-19 Pandemic on the Welfare of the Maasai Girl Child in Narok County, Kenya	Joshua Ole Kelele (Maasai Mara University)

9:10 AM 9:25 AM	Challenges and Opportunities for Academic Libraries during and Post COVID-19 Pandemic	Rahab Koech (Maasai Mara University) and Nancy Kimile	The Role Of A Social Worker In The Prevention Of Jigger Infestation Among Children In Kisii County, Kenya	Amadi Justine Orucho (Maasai Mara University)	Women in STEM education and its implications on their involvement in Climate Change: A case study of female students enrolment and completion rates at Maasai Mara University	Tabitha Alango (Maasai Mara University), B. J. Troon & Isaac Motochi
9:25 AM 9:30 AM	Commercial Break			ICT ( <i>George Kamweru</i> )		
9:30 AM 9:45 AM	Coping with Implications of Government Policy on COVID-19 Pandemic on Livelihoods among Kahawa Wendani's Low-Income Residents in Kiambu County	Maurice Omollo (Maasai Mara University)	The Response of the COVID- 19 Pandemic on the Indigenous communities: Case of Access to Emergency health care Among the Ogiek of Kenya	John Ndung'u Kung'u (Laikipia University) & Babere Kerata Chacha	The Role Of A Social Worker In The Mitigation Of Child Sexual Abuse In Kisii County	Orucho J. Amadi (Maasai Mara University) & Karani Onyiko
9:45 AM 10:00 AM	Role of the Church in Curbing Drug Addiction Problems during the COVID 19 Pandemic in Kenya: A Case Study of Nairobi Chapel	Joseph Kibet (Africa International University), Henry Mutuma & Gyang David Pam	Implications of Coronavirus (Covid-19) on the Stability of Luo Funeral Cultural Ceremonies in Kenya	Benard Okal (Maseno University), Yakub Adams, Jackline Okello, Benard Kodak	The Susceptibility Of Pupils To Sexual Abuse In Emesa Sub-Location, Kisii County-Kenya	Amadi Justine Orucho (Maasai Mara University)
10:00 AM 10:25 AM	TEA BREAK (Entertainment for virtual participants)			Catering & Hospitality		
<p align="center"><b>SUB-THEME 3: ADAPTING TO THE NEW NORMAL IN THE ACADEMIC ENVIRONMENT: CHALLENGES, PROSPECTS AND OPPORTUNITIES</b></p> <p align="center"><b>(Main Link: <a href="https://meet.google.com/ywh-sipg-run">https://meet.google.com/ywh-sipg-run</a>)</b></p>						

10:25 AM 10:55 AM	Sub-theme 3 Keynote Speaker			Prof Patricia Forbes, University of Pretoria (S. Africa)		
10:55 AM 11:05 AM	Q/A for Keynote speaker			Dr. Beatrice Manyasi		
11:05 AM 11:10 AM	<b>Commercial Break &amp; Convergence of Participants to different Rooms/Links</b>			<b>ICT</b>		
	Session 19A – Education (Room 1/Link 1: <a href="https://meet.google.com/jkp-cocz-twj">https://meet.google.com/jkp-cocz-twj</a> )	Dr. Sammy Mutisya (Moderator) <i>ICT Support – Mark/Kibaso</i>	Session 19B – Education (Room 2/Link 2: <a href="https://meet.google.com/ttx-cazs-fwk">https://meet.google.com/ttx-cazs-fwk</a> )	Dr. George Rukaria (Moderator) <i>ICT Support – George/Patrick</i>	Session 19C – Education (Room 3/Link 3: <a href="https://meet.google.com/zrk-cbbq-nqk">https://meet.google.com/zrk-cbbq-nqk</a> )	Dr. Charity Konana (Moderator) <i>ICT Support – Njoroge/Sadia</i>
11:10 AM 11:25 AM	COVID-19 brings a fresh and major crisis to the education sector. What does a "new normal" for future generations look like?	Thomas Ongallo (Kenya Methodist University)	The Effect Of Leadership Practices On Employee Performance In Public Secondary Schools In Kenya	Everline C. Bukhuni (JKUAT)	Modes Of Financing Higher Education And Their Implications On Students' Performance, Quality Of Education And Completion Rates: An Experience Shared From Maasai Mara University, Kenya	Florence Osiri Mobegi (Maasai Mara University)
11:25 AM 11:40 AM	Re- Conceptualizing Sustainable Learning: Reflections on Opportunities Post COVID -19 for Selected Universities in South Western Kenya	Billiah Gisore (Kisii University)	Post Covid -19 Pandemic Economy: Building Resiliency in Teaching and Learning environment and Compliance with Infrastructure requirement in Universities in Kenya.	Justus Ojuok (Maseno University) and James Sika	Preparedness In The Implementation Of Competency Based Curriculum	Anne Maine (Maasai Mara University)
11:40 AM 11:55 AM	Effects of Covid-19 Pandemic on The Academic Perception of Class 8 and Form 4 Students Towards Their National Exams: A Case	Morompi Ole Masago (Maasai Mara University)	Digital literacy and effectiveness of online learning among pre-primary school learners with special needs in narok county.	Consolata Mary Shinali (Maasai Mara University)	Influence Of Entrepreneurial Risk-Taking Practices On Organizational Performance Of Basic	Andrew J. Nyakweba (JKUAT), Greggory S. Namusonge

	Study of Narok County, Kenya			and Naftali Rop	Education Enterprises In Kenya	& Samson P. Nyang'au
11:55 AM 12:00 PM	Commercial Break			ICT ( <i>Isaac Kihara</i> )		
12:00 PM 12:15 PM	The Influence of E-Learning Technology Strategy on Learner Goals Achievement in The Kenyan Universities	Eunice Gacheri Thiankolu (Kenya Methodist University), Thomas A. Senaji & Wilson N. Muema	The Implication of COVID -19 Pandemic to Implementation of Competency-Based Curriculum in Kenya	Florence Kisirkoi (Maasai Mara University)	Parental Challenges in the covid-19 era	Anne Maine (Maasai Mara University)
12:15 PM 12:30 PM	Adapting to The New Normal; The Learning Design challenge in Higher Education	Beatrice Manyasi (Maasai Mara University)	COVID-19 Pandemic And Possible Trends For The Future Of Higher Education: A Review	Augustine Kara (maasai Mara University)	Positive effects and Challenges in Integration of ICT in Teaching and Learning Mathematics in Secondary Schools, Meru County, Kenya.	Honjen Kirikua Thiharu Maingi (Maasai Mara University), Paul Maithya
12:30 PM 12:45 PM	Determinants Of Employee Performance At The Ministry Of Education Headquarters In Kenya	Gachui John Gitau (JKUAT), Were, Susan, Namusonge	Relationship Between Principals' Integration Of Stuent's Councils, Open Forums' Change Strategy In School Management And Students' Academic Performance As Perceived By The Teachers In Public	Consolata Kimani (Maasai Mara Univ.), Gerald Kimani & James Kimani	Effect of Green Manufacturing on Performance of Manufacturing Firms in Kenya	Rutere Yusuf (Meru University)

			Secondary Schools In Nairobi County, Kenya			
12:45 PM 12:50 PM	Commercial Break			ICT ( <i>Mark Anyanga</i> )		
12:50 PM 1:05 PM	Information Technology And Performance Of Agency Banking In Commercial Banks In Kenya	Martin N. Mbugua (JKUAT), Margaret Oloko and Jared Ndeya	Role Of Stakeholder Participation In Electoral Process In Kenya	Mutie Brian Muithya (JKUAT)	Influence Of Turnaround Strategies on Organizational Performance Of County Governments In Kenya	Irene Mwendu Mutie (JKUAT)
1:05 PM 1:20 PM	Influence of Flexible Work Scheduling on Performance of Nurses in Regional Hospitals in Tanzania	Elisifa Nnko	Influence of Devolved Procurement Governance Structure On Service Delivery in The Public Health Sector in Kenya	Lawrence Asidaga Masaviru	The Effects of Training and Development on Employee Performance In 21 <sup>st</sup> Century Organisations ‘A Case Study Of The Narok County Government’	Sarah Gakure, Belinda Kisia & Dr. Naikuni Daniel
<b>1:20 PM 1:50 PM</b>	<b>LUNCH BREAK (Entertainment for virtual participants)</b>			<b>Catering &amp; Hospitality</b>		
2:00 PM 2:20 PM	Issuance/Showcasing of Certificates, Physically for Organizers and virtually for Online Presenters			Guest 1		
2:20 PM 2:40 PM	Lessons learnt from the Conference			Dr. Aloys Osano, Director (Research & Innovation) & Prof Romulus Abila, Conference Chair		
2:40 PM 3:00 PM	The Way Forward			Prof. Bulitia Godrick, DVC (AS&A)		
3:00 PM 3:20 PM	Closing Speech			Prof Kitche Magak, Ag. VC		
3:20 PM 3:35 PM	Vote of Thanks			Dr. Kodak		
3:35 PM	Closing Prayers			Volunteer 6		

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To access main conference link	<b>(Main Link:</b> <i><a href="https://meet.google.com/ywh-sipg-run">https://meet.google.com/ywh-sipg-run</a></i> )	Call/Whatsapp; +254-721284526 (Njoroge)
Difficulties in accessing room 1/link 1	<b>(Room 1/Link 1:</b> <i><a href="https://meet.google.com/jkp-cocz-twj">https://meet.google.com/jkp-cocz-twj</a></i> )	Call/Whatsapp; +254-725513032 (Kibaso)
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Difficulties in accessing room 3/link 3	<b>(Room 3/Link 3:</b> <i><a href="https://meet.google.com/zrk-cbbq-nqk">https://meet.google.com/zrk-cbbq-nqk</a></i> )	Call/Whatsapp; +254-786835417 (Sadia)



## FIRESIDE TALKS PRESENTER



**Dr. Ben Koissaba, Indigenous Concerns Resource Center**

Dr. Ben R. Ole Koissaba holds a Ph.D. in International Family and Community Studies from Clemson University, South Carolina, USA, a Post-Doctorate in Advanced Rehabilitation Research from Langston University, Oklahoma, an MA in Social Entrepreneurship from Northwest University, Kirkland, Washington, USA, and a Post-Graduate Diploma in Theology and Development from the Oxford Center for Mission Studies of the University of Leeds, UK. Dr. Koissaba is a Certified Development Project Manager and a holder of several professional certifications including Occupational Safety and Health Administration, Project Information Management Systems, Project Design Monitoring & Evaluation, Financing for Development, Advocacy and Human

Rights, among others.

Dr. Koissaba has extensive experience working for Non-Profits and government agencies in Africa and the United States as well as International institutions like USAID, AusAid, UNDP, DFID, the World Bank, and the European Union. Dr. Koissaba has contributed immensely to the work of global Indigenous Peoples through advocacy work and representation at global forums including the United Nations where he was the global co-chair for the United Nations Permanent Forum on Indigenous Peoples' during the 2009 session.

Dr. Koissaba's broad research interests are in indigenous societies of Sub-Saharan Africa, globalization, environmentalism and development, social justice, and human rights. Nevertheless, within these foci, is a strong work, consultancy, and research experience in community-engaged research in community development as it pertains to the challenges facing the minorities and/or underrepresented indigenous peoples in other parts of the world. Thus, he has researched, published, advocated for, and made many conference presentations on the land, ecological, and development challenges of the Maasai community of Kenya and other minority groups.

Dr. Koissaba has several publications which include a book "Local Advocacy to National Activism: Maa Civil Society Forum, Kenya. ISBN 978-3-659-26221-0. Lambert Academic Publishing, and book chapters "Elusive Justice: The Maasai Contestation of Land Appropriation in Kenya: A Historical and Contemporary Perspective" in M. M. Kithinji, M. M. Koster, & J. P. Rotich (Eds.), "Kenya after 50: Reconfiguring historical, political, and policy milestones", Basingstoke, U.K.: Palgrave Macmillan, several, and E-learning Principles and Practices in the context of Indigenous Peoples: A Comparative Study. In M. Gitau, P. Mutisya, C. Kamau, C. Wiczorek, & J. Ngundi (Eds), Kenyan Education System: Are We Preparing Students to Meet Current Global Needs and Challenges. BookBaby, among others.

## **PARTICIPANTS ABSTRACTS**

### **SUB-THEME I: TOURISM, HOSPITALITY AND LEISURE IN A POST-PANDEMIC WORLD**

## Thematic Area 1: Tourism and Hospitality

### Community Resilience Models for conservation of cultural ecosystems services and tourism management post COVID-19 pandemic in park-adjacent communities within Aberdares National Park, Kenya.

Felix Lamech Mogambi Ming'ate<sup>1</sup> and Shem Wambugu Maingi<sup>2</sup>

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#### Abstract

Kenyan indigenous forests are underrated by park-adjacent communities as they do not reflect the socio-economic development priorities of communities adjacent to protected areas. Wellmanaged small scale and community-based tourism enterprises could allow the non-consumptive use of Kenya's increasingly scarce indigenous forest resources, provide alternative Post COVID19 livelihoods and thus make an important contribution to their management. The paper, sought to develop a generic best practice model for sustainable conservation of cultural ecosystems services post COVID-19 pandemic. Cross-sectional survey research design was used to determine the sub-sets from different groups involved in the study namely the local community, key informants and observation participants. Data collection methods were both qualitative and quantitative in nature. The sampling of participant communities was done by sampling households from the areas adjacent to the National park within a radius of 2 KMS. The population of communities adjacent to the park as per Kenya Wildlife Services statistics assisted in determining the sample size of communities. Thus 100 households were included in the study. The communities adjacent to the park were randomly selected. Since this research used humans as a source of information, all the participants' information was kept confidential by using pseudo-names and coding to protect them and enhance confidentiality. The study was subjected to ethical approval from Kenyatta University Ethical Review Committee and a research permit from NACOSTI. The results indicate that a community based coping strategy is very important to enhance the resilience of communities post COVID-19. It is recommend that government reviews tourism policies to encourage local governance and community participation in development of a post COVID-19 resilience and recovery model.

**Key words:** Community resilience. COVID-19, Tourism, Sustainable tourism, Kenya

## **Application of Big Data in Positioning Products and Services by Hotels in Kenya**

By

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### **Abstract**

The phrase Big Data (BD) was coined in the 1990s and can be defined as extremely large sets of data that comes into businesses daily. Several hospitality leaders still struggle to offer carefully personalized experiences that enthrall their guests. In the face of COVID-19, many sectors of the economy including hospitality have been forced to forge a closer relationship with science and lean towards data driven decisions to effectively respond to the unprecedented challenges caused by COVID-19. Despite the amassing of big data across the globe on exogenous shocks much of the current growing data remains untapped, to the detriment of society, industry and policy. By mobilizing and analyzing data around exogenous events like COVID-19, hotels would better design their products and services, directives and guidelines, ultimately leading to well-grounded decisions. Evidence suggests that hotels in Kenya have begun to harness the potential of big data to mitigate the impacts of COVID-19. However, limited studies have attempted to investigate the impact that data-driven decisions are having on hotels in the face of COVID-19 pandemic hence the need for this study. This research sought to find out the application of big data by hotels in Kenya in positioning their products and services during and post COVID-19. The hotel was purposively selected due to its vibrant presence on various social media platforms and the representative nature of its units. This study employed a mixed methods research approach. Data was collected and analyzed from the social media platforms of the hotel. Findings indicate that hotels should appreciate the ability to use available data to make changes to their businesses hence increasing both business and customer experiences. This provides opportunity to gain competitive advantages, improve customer experience through personalization, enhance their marketing strategies and optimize costs and capacity. However, tackling of big data challenge including data disasters, encryption and analysis in hospitality remain areas of concern for businesses.

**Keywords:** Big data, hospitality, pandemic, positioning

**Transformational Leadership and Competency Development in Tourism and Hospitality Training Institutions in a Post-Coronavirus Pandemic in Kenya**

**By**

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**Abstract**

The purpose of this study was to assess the contribution of transformational leadership and competency development in tourism and hospitality training institutions in a Post-Coronavirus Pandemic in Kenya. The study adopted descriptive survey research design. The sampled population of the study was 340 trainees and 40 Principals of various Tourism and Hospitality TVET Institutions across the country. Regression analysis was used to test the magnitude and direction of the relationship and level of significance. The study findings revealed that there is a strong positive and significant relationship between transformational leadership (idealized influence, intellectual stimulation,) and competency development. The study recommended to top management of the institutions to ensure that all the transformational leadership parameters are fully implemented to improve competency development in a Post-Coronavirus Pandemic in Kenya. This should focus on the opportunity for online teaching and learning to ensure continuity of education; improvement of education systems and robust e-learning infrastructure; ensuring quality and integrating lessons learnt and good practices from COVID-19 response as espoused by the E-learning approach; and conceiving a model roadmap for post COVID-19 which integrates continuity of education in the different institutions across the country. This research has a vital contribution to the literature by studying the limited evidence on the leadership styles and competency development in the learning in a Post-Covid 19 pandemic in the African context.

**Key Words:** Transformational Leadership; Competency Development, Post-coronavirus Pandemic.

## **Effect of Time-Based Conflict on Employee Productivity: Does Altruism Matter? A Reflection from star-rated Hotels in Kenya**

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### **Abstract**

The current study sought to assess the influence of altruism on the relationship between time-based conflict and employee productivity in star-rated hotels in Nairobi-Kenya. The study adopted explanatory design. A total of 4725 employees from 30 star rated hotels were targeted. Nassiuma formula (2000) was used to sample 214 employees to answer questionnaires. Stratified sampling was employed to select employees from the departments chosen. Bias Corrected Bootstrapping of SEM, using AMOS version 5, in SPSS version 23 was used to test the hypotheses. The results showed that for each unit increase in time-based conflict, there was a decrease in employee productivity. These findings illustrated that the conflict experienced by employees negatively affects employee productivity. The results further showed that when Altruism is exhibited, it reduces the influence of time-based conflict on employee productivity. This shows the importance of employees exhibiting altruism to reduce the effect of the conflict for employee productivity to be achieved. The study findings will be insightful to management in the hotels to develop guidelines to help hotel managers and supervisors improve employee productivity through the use of altruistic behavior.

**Keywords:** Time-based conflict, Altruism, Hotel Employees, Employee Productivity, Star-rated hotels.

## Role of Civil Society on Wildlife Group Conservancies Governance in Kenya

By

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### Abstract

Civil society capacity is a key factor in scaling up responsive solutions to natural resource governance and conservation challenges in Africa. They have played a key role in the African natural resource field yet despite widespread acknowledgement that African CSOs have a critical role to play in improving conservation and natural resource governance, there remains relatively little focus on how civil society is supported, invested in, and sustained over time (or not) in order to improve wildlife group conservancies in Kenya. The group conservancies are formed by combining private land which share a common border to form a larger land area viable for the purpose of wildlife conservation and management. Most group conservancies are found around the *Masai Mara Game Reserve* in Kenya. To guide the analysis a conceptual framework was developed that utilized literatures of conservancies governance, membership associations and that of partnerships. The roles of civil society on setting, advocacy and policy development, meta-governance, ensuring good governance, information sharing, capacity building and leadership conservancies were researched. The relationship of civil society was analyzed in terms of whether civil society is viewed as complementing or challenging the authorities of the government and other conservation organizations. The study was based on 146 representatives of conservation organizations, rangers, management of conservancies and county environmental officers. The study results established that the civil society participation in wildlife conservancies' governance facilitates effective wildlife conservation and management that is community centered attainment of environmental justice and eradication of poverty. The pivotal role that the civil society were identified in ensuring responsiveness of the stakeholders through effective issue-based engagement, increasing community interest and improving community involvement in the decision making process for the protection of the wildlife group conservancies.

**Key Words:** Civil Society, Wildlife Conservancy, Governance



**Investigating the Effects of Covid-19 pandemic on Narok County's Tourism and Hospitality Sectors  
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**Abstract**

Tourism and hospitality sectors are one of the biggest economic pillars of Narok county, Kenya. This study was conducted to examine the exact level and nature of the effects of Covid-19 pandemic on the sector in Narok county. A cross-sectional design of study was used. Questionnaires, interview guides and observations were used for data collection. The findings indicated that over 70% of the clients were non-willing to resume with tourism activities after the pandemic is over. Some of the stakeholders had partially or fully changed their profession. The average number of clients visiting tourism destination sites had reduced by 84% within 3 months. The clients had changed their perception of preference, with economy and safety being preferred over comfort. As a result, their mode of transaction and travel had changed. There was no significant change in the preferred tourism destination sites ( $P < 0.05$ ). The stakeholders net profit margins had reduced from in excess of Ksh. 40,000 to less than Ksh. 10,000 per month. It was concluded that the sector had truly been ravaged by the pandemic. The stakeholders recommend cushioning in form of tax-waivers, monthly stipends or incentives from the county and national government.

**Keywords:** Tourism and hospitality sector, Covid-19 pandemic, stakeholders, Narok county, economy

**Devolved Governance Systems Enhancing Youth Participation in Wildlife Conservation in a Post-Covid 19 Pandemic in Kenya**

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**Abstract**

Coronavirus travel restrictions mean that humans have suddenly vanished, and along with them a billion-dollar tourism industry that employs millions and underpins a symbiotic human-wildlife ecosystem, that is essential to wildlife conservation in many developed and African countries. Now, with tourism revenue nearly zeroed out, most workers at Kenya's community-owned wildlife conservancies are furloughed, and payouts have been reduced or suspended entirely. Youths in many communities are considering a return to grazing, jeopardizing decades of wildlife conservation efforts across the country's vast grasslands. Devolved governance now remains a key pillar for the youths in the communities to embrace wildlife conservation. This paper focuses the role of devolved governance systems in enhancing youth participation in wildlife conservation in Kenya. The study adopted descriptive survey research design. The sampled population of the study was 300 youths from different communities involved in the wildlife management around Amboseli National Park and Maasai Mara National Reserve. The study reports low levels of youth participatory in governance and conservation of wildlife in Amboseli National Park and Maasai Mara National Reserve. In addition, nearly 12 years down the line since devolution in Kenya, youth participatory in governance and conservation of wildlife is yet to be felt. It was recommended that county governments should institutionalize youth participation by building the capacity of youths in the communities to facilitate participatory wildlife conservation at local level. There is need to have awareness campaigns on the value of wildlife and conservation, risks and adoptive mechanisms, utilize youth-friendly wildlife conservation activities to act as entry points for conservation; activities and other advocacy events to be passed through community- youth friendly channels to encourage ownership and participation in wildlife management in a Post-Covid 19 pandemic era.

**Key Words:** *Devolved Governance Systems; Youth Participation, Post-Covid (19) Pandemic*

**Role of Board of Directors on Performance of Tour Firms Operating in Maasai Mara National Reserve in a Post-Covid 19 Pandemic in Kenya**

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**PhD Scholar, Leadership & Governance, Jomo Kenyatta University of Agriculture and Technology, Kenya**

**Abstract**

This paper locates its relevance in the post-coronavirus era. The COVID-19 pandemic has redefined the world operation which shows a higher impact on the business field. Accordingly, this study aims to find the role of board of directors on performance of tour firms operating in Maasai Mara National Reserve in a Post-Covid 19 Pandemic in Kenya. The study employed descriptive research design which included quantitative approach and secondary data was collected from April 2021. A sample data of 38 registered tour firms operating within Maasai Mara were used to evaluate the role of board of directors on performance of tour firms. After targeting all tour firms operating within Maasai Mara, only 38 firms had disclosed their annual report by the time of conducting this research. The results depicted that the pandemic has affected performance of tour firms measures unfavorably. Further, boards of director's show a positive association with firm performance. The study recommends that there is a need for board of directors to enhance management's risk assessments in the midst of COVID-19; ensure that there are business continuity plans; there is organizational resilience; there is need for development of new digital strategies; enabling the digital workforce in the firms and have effective communication plans with both internal and external stakeholders to deal with uncertainties and develop more post-COVID practices for boards of directors to improve performance of tour firms in Kenya. The practical implications of the study is that the research outcomes might assist regulatory bodies, policymakers and companies in their formulation of public and corporate governance strategies concerning future emergency preparedness and responses. This study also provides a unique contribution to the literature of COVID-19 and firm performance in developing economies context.

**Key Words;** Board of Directors, COVID-19, Firm Performance, Maasai Mara, Tour firms

**Effects of Covid-19 pandemic on Tourism and Hospitality  
Operations in Narok County**

**Industry**

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**Abstract**

The outbreak of Covid-19 has had adverse effect on economic activities and drastically affect the contribution of the hospitality industry to the GDP. Tourism and hospitality sectors is one of the critical economic pillars of Narok county. Nonetheless, just like many sectors of the economy, the industry in Narok County has been hard hit by the pandemic. Therefore, this study was conducted to examine the exact level and nature of the effects of Covid-19 pandemic on the sector in Narok county. The study applied a quasi -experimental design with data collected and analyses using a two-way t-test statistic to compare the in-operation metrics before and during Covid 19 period. The findings indicated that the average number of clients visiting tourism destination sites had reduced drastically within one year. It was also evident that the stakeholders net margins had reduced drastically. It was evident that the sector had a devastating hit from the pandemic. The researchers recommend that Covid-19 mitigation strategies- tax, license, fees, and levies should be waived for periods the entities were out of business. Finally, there is need to provide special sub-sector financial support by both the Narok county and national government with a view to spur revitalizing of the sector.

**Key words**

*Covid-19, Tourism, Hospitality, Industry*

## Effect Of Covid-19 Pandemic On Kenya's Hospitality Sector: A Market Analysis Trend

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### Abstract

The Kenya's hotel sector has experienced unprecedented challenges amplified by Covid-19 pandemic. However, there exist paucity of robust data in terms of market analysis to help inform a post-covid-19 pandemic market performance strategy for the hospitality sector's recovery. This study employed a systematic analysis of ten-year secondary data of two hundred and fifty-two (252) Kenya's hospitality facilities to indicate the market performance trend. The data generated was in terms of percentage occupancy, average daily rate (ADR); average per available room (RevPAR); and demand, supply and revenue performance. The results showed that even though Kenya's hospitality sector had an average market performance before the Covid-19 pandemic, the pandemic has deepened the market performance. Finally, a post-Covid-19 pandemic market performance response and recovery strategies are proposed.

**Key words:** Covid-19 pandemic; Kenya's hospitality sector; Market analysis trend

**SUB-THEME 2: BUILDING RESILIENT SYSTEMS TO RESPOND TO ENVIRONMENTAL SHOCKS  
IN HEALTH, AGRICULTURE, NATURAL RESOURCES AND ECONOMIC SYSTEMS**

## Thematic Area 2: Environment

### Factors Influencing Public Participation in Environmental Impact Assessment of the Proposed RUAI Sanitary Landfill Project in Nairobi City County, Kenya

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#### Abstract

Public participation is a key component in environmental impact assessment process. It is a process whereby concerns, needs and values of the public are incorporated in decision-making with the overall goal of ensuring that the issues raised by the public are incorporated in the project document before implementation. Environmental impact assessment (EIA) as a process seeks to ensure that adequate prior information on the likely environmental consequences of development projects, on possible alternatives and on measures to mitigate the adverse impacts are obtained from the public. EIA is therefore an important tool used to ensure significant adverse impacts of proposed major projects are addressed so as to promote sustainable development. This study helps in building resilient systems in economic systems especially in all development projects. The study responds to the realisation of the Kenya's Big Four Agenda which is an economic blue print meant to foster economic development and to provide solutions to various socio-economic problems facing Kenya. The study focused on a proposed infrastructure in Nairobi City. At the global level the study helps in the realisation of sustainable development goals (SDGs) 2030 goal number 11 on sustainable cities and communities. The study was motivated by the desire to come up with solutions that will mitigate the adverse impacts of development activities on the environment. The objective of the study was to examine key factors influencing public participation in the EIA process for the RUAI sanitary landfill project in Nairobi City County. The study adopted a descriptive research methodology using a total sample of 120 respondents sampled in RUAI area within the County. The key finding of the study is that despite high levels of public awareness about the proposed project, there was low knowledge on the need to participate and low levels of actual participation in the EIA process. The reasons for low participation were attributed to lack of time, lack of knowledge about the need for participation and lack of trust and transparency in the EIA process. The study recommends enhancement of public education about public participation in development projects. Project planners and implementers should observe transparency during the EIA process to ensure increased public trust, acceptability and support of development projects.

**Keywords:** Public Participation, Environmental Impact Assessment, Public Education, Transparency, Trust, Acceptability.



## The Impact of COVID 19 on Environmental Conservation

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### Abstract

COVID 19 is a global challenge affecting environmental conservation. There is need for sustained efforts to reduce negative environmental impacts. The objective of this paper is to review literature on the impact of COVID 19 on Environmental Conservation. Findings showed that in 2020, 71 countries representing 97% of fossil CO<sub>2</sub> emissions, decreased emissions at the peak of the country's confinement by 27%. Disruptions in aviation and shipping had the largest impact on emissions. Biomedical waste, masks, gloves, sanitizers, personal protective equipment is generated daily. 3.40 kg of waste is generated by each infected person. Hospitals in Wuhan, China generated 240 metric tons of medical waste per day compared to 50 tons per day pre-COVID-19. Recycling of solid waste has reduced since they increase risk to workers. COVID 19 is not detected in treated drinking water, surface or groundwater sources. COVID 19 in the excreta of patients has been reported. Oxidation ponds, chlorine, filtration and ultraviolet (UV) light can be used for treatment of waste water. Communities need to follow proper chlorination and boiling techniques to disinfect. Lockdown decreased movement of people in coastal areas, which led to clean beaches and marine biodiversity conservation. Eight lions in an Indian zoo tested positive for COVID-19. There is no evidence that animals can transmit the disease to humans. COVID 19 could be maintained for a prolonged time in the soil. Lockdowns resulted in reductions in transport and commercial activities, reducing noise levels in cities. New policies are needed to sustain reduced global emissions. Research is needed to investigate the relationship between air pollution and the spread of COVID-19. New approaches are needed for solid and waste water management. Wastewater could be used for early warning. Research is need on the impact of COVID 19 on soils, plants and the use of waste water.

### Key words:

Covid-19, environment, scientific changes

## **EXAMINING THE LEGAL FRAMEWORK FOR THE CONSERVATION OF THE MAU FOREST COMPLEX**

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### **Abstract**

The Mau forest complex is the source of life for the Western part of Kenya. It is the catchment basin that springs from the major and important rivers which are relied on by human, plant, and animal life in this region for sustenance. Regrettably, over the years at least 40% of the forest complex has been destroyed since independence. This is majorly due to the lack of gazettelement of all the parts of this important forest complex. Moreover, due to the phenomenal population increase in Kenya, scarcity of land has pushed people to encroach on the forest complex to deforest land for farming and shelter. The majority of the encroachment occurred during the reign of the first two presidents of Kenya (during the KANU era). Some forest cover has been lost to illegal loggers who cut the forest trees to make timber and charcoal. After a series of droughts that severely affected the whole country in the past decade to the extent which some major rivers dried up and others became seasonal, there was consensus that the perennial lack of rain in the country stemmed from the laxity of the state to protect water towers such as Mau forest complex which gave a loophole for illegal loggers and encroachers to destroy the forest. The change in climatic patterns has led to the rise in communal and also human-wildlife conflicts along with important water sources such as the Mara river. Efforts to rehabilitate the water tower have been met with commendation and condemnation in equal measure. Political undertones have been a major setback in efforts to save the Mau. It is undeniable that politics has been at the center of the Mau conservation. Politicians were among the first people to encroach on this important forest complex. Further, they have also protested the forceful eviction of their people. Politics aside, the Mau forest has been home to indigenous communities such as the Ogiek. This paper examines the legal aspects of the efforts made to conserve the Mau water tower. It grapples with all the segments of the Mau rehabilitation. For instance, the steps are taken to repossess the encroached land and the intrigues of the eviction process. Moreover, this paper will dwell on the rights of the Ogiek as forest dwellers. Above all, this paper will examine the legal framework for the conservation of the Mau and suggest areas that should be evaluated for the successful conservation of the forest tower.

**Key words:** Mau complex, environment, law

**ASSESSMENT OF CLIMATE VARIABILITY IN KENYA AND ITS IMPLICATIONS ON FOOD SECURITY:  
THE CASE OF KISII COUNTY, KENYA.**

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**Abstract**

Climate variability and change has been singled out to be one of the modern challenges that affect economies of several countries leading to food scarcity and food insecurity in several parts of the world and represent a fundamental contemporary environmental shock. Kenya is no exception. This research was conducted in Kisii County, a perceived national bread basket and investigated the trend in climate variability between the years 1983-2013. The objective was to examine the precipitation and temperature trend in Kisii County. The research question was to find out whether there was any significant trend and pattern of rainfall and temperature as indicators of climate variability. The study examined climate variability for thirty-one years (1983 to 2013). Raw data was obtained from Kenya Meteorological Department and their annual means computed. Mann Kendall statistic test was applied to establish whether the trend of precipitation and temperature observed was significant. From the analysis, rainfall did not show any significant trend in Kisii County whilst temperature revealed a significantly upward trend over the years, at 95% confidence level. There is need to incorporate weather prediction and early warning systems by the Ministry of Agriculture and promote afforestation programmes. To build resilient systems to climate shocks, introduction of high temperature tolerant food crops as well as adoption of climate smart agriculture should be explored.

**Key words:** Climate variability, Kisii County, food security, climate shocks, climate smart agriculture, SDG 1, SDG 2

## Prioritization of Loita Maasai medicinal plants for conservation

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### Abstract

Medicinal plants provide biodiversity-based ecosystem services including health to many communities around the world and therefore, medicinal plant conservation is vital for sustainability. Here, we identify medicinal plants to be prioritized for conservation among the Loita Maasai who are pastoralists in the extensive East African savannah. A botanical survey and interviews were conducted with 91 villagers; 49 women and 42 men drawn randomly from 45 households. A conservation priority list was developed based on (1) the plant part harvested, (2) the species use value, and (3) its availability. These criteria were evaluated independently for each species on a scale from 1 to 4 and their sum was taken as the species' score. The score for the species varied from 5 to 9. The higher the total score value of a species, the higher its priority for conservation. Among the medicinal plants used by the community, 20 species were shortlisted as regularly used and found around the village. Out of these, 12 species that had scores above seven were considered top priority for conservation. A total of 1179 use reports were obtained from the villagers and they were placed in 12 use categories as defined in the International Classification of Primary Care system. Plants used to treat *digestive system disorder* had most use reports (21%), followed by the *muscular skeletal disorders* (20%). This study identified 12 medicinal plant species that should be given conservation priority to make them available for the well being of the people and sustainability of ecosystem products and services. An assessment of medicinal plants species using standard ecological methods is recommended.

**Keywords:** Medicinal plants conservation, Ethnomedicinal uses, Prioritization, Loita Kenya, Maasai

## Impacts of Non-revenue water loss on water quality, quantity and the environment

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### Abstract

Non-revenue water loss is a global problem faced by water utilities around the world and despite the measures and strategies that have been put in place. These efforts are usually centered towards ensuring that water utilities are able to maximize their profits and therefore the water that is lost is usually compensated by extracting and distributing more water to meet the demand and generate more revenue while overlooking the negative ecological footprints caused during the process of water distribution. These environmental impacts however can sometimes be subtle and thus may be difficult to ascertain and quantify. Data was gathered through purposive sampling of 26 Key informants Interview, 16 discussants in a Focused Group Discussion, Chemical analysis of water from KIWASCO's main water treatment plant and observations by the researcher. The data was then subjected to the descriptive analysis and presented in frequency tables and figures. The findings of the study indicated that majority of the respondents (78.57%) believed water quality was significantly affected by pipe bursts/leakages while 16.67% and 4.76% argued for illegal water consumption and accounting errors respectively. Similarly, the FGD participants also agreed that pipe burst/leakages has significant negative impacts on water quality. They stated that whenever a pipe burst occurs, the pressure with which that water is running will determine how many foreign particles will be washed away and infiltrated in the distribution channels. An analysis in the change of water quality parameters also indicated there was a significant positive correlation between pipe bursts/leakages and water quality components ( $p$ -value  $> 0.05$  and  $\rho=0.872$ ). The findings also indicated that from May through October 2019 KIWASCO lost approximately 158,500 cm<sup>3</sup> representing a 31.17% water loss which is 6.17% higher than the Kenyan Water Services Regulatory Board's recommended levels of 25%. An environmental risk analysis done to evaluate the significance of the impacts using the Failure Modes Effects Analysis (FMEA) indicated that NRW loss significantly affect water quality including pollution at source, water quantity, air pollution, destruction of water catchment, water shortage, adverse health implications, water logging, soil erosion and sedimentation. Aesthetic value, effects on downstream communities and loss of biodiversity on the other hand were found to not be significantly affected.

**Keywords:** Non-Revenue water, environmental impact, water quality, water quantity

**Potential for Roof Rainwater Harvesting To Provide Cost Effective and Environmentally Sustainable Source Of Handwashing Water At Maasai Mara University**

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**Abstract**

SDG 6 on water, sanitation and health can be considered as a cornerstone develop goal that will enable achievement of other development milestones. The COVID 19 pandemic has provided an unprecedented environmental health shock that has demonstrated the central role of water in human health. The COVID-19 pandemic has brought about fundamental and perhaps irreversible shifts in human – environment interactions. This paradigm shift in the way humans human interact with the natural environment has called for the need to develop innovative, low cost and environment friendly means of adapting to an increasingly changing bio – physical environment. The requirement of providing water for handwashing in institutions of learning is largely going to be a challenge to primary schools located in water scarce environments like Narok and that actually require more water since hand washing requirements for children is higher. Narok is an area prone to extreme weather events (EWEs) and roof rainwater harvesting (RWH) should provide a very sustainable source of water during the heavy rains. This appropriate technology can easily be adopted and replicated in similar scenarios. Maasai Mara University main campus is endowed with a vast capacity to provide water for the mandatory handwashing through roof rainwater harvesting. This potential largely remains untapped or not fully developed. This paper provides preliminary data and a discussion point on an ongoing project aimed at promoting roof rainwater harvesting at Maasai Mara University as a source of reliable, cost effective and environmentally sustainable source of handwashing water to combat spread of COVID-19 in this arid and semi arid (ASAL) landscape based on the principles of circular economy.

**Key words:** SDG 6, WASH, COVID-19, Roof rainwater harvesting, Maasai Mara University, Circular economy

## **Extermination of Parthenium Hysterophorus Invasive Weed for Environmental Sustainability**

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### **Abstract**

Parthenium invasive killer weed species adversely affect ecosystems at multiple tiers. These invasive alien plant species often disturb the native species composition by destabilizing the vegetative biodiversity by dominating the landscape of the invaded area. The occurrence of the parthenium invasive killer weed in grasslands is reported to have reduced forage production up to 90% besides making land less fertile; affecting grazing land, animal health, and milk and meat quality. Medical and veterinary effects have manifested in most counties of the country. The parthenium invasive killer weed is known to affect animal and human health. It caused massive losses of biodiversity hence was recorded as an invasive killer weed species in Kenya. Infestation by parthenium invasive killer weed degraded natural ecosystems and reduced yields of agricultural crops and decreased water availability, caused costly land degradation, blocked transport routes and contributed to the spread of diseases. The research objective was to exterminate of parthenium hysterophorus invasive weed for environmental sustainability. Literature review from primary data gathered from relevant documents published by individual researchers and other research organisations were the main methods of data collection for this paper. When Parthenium Hysterophorus invasive weed robs all food from another organism hence it was recommended for small, medium and large scale farmers to always carry out hand uprooting for scattered Parthenium Hysterophorus killer invasive weed.

**Keywords:** Weeds, alien plant, biodiversity, environmental sustainability



## **Water Pollution Detection System**

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### **Abstract**

Nowadays Internet of Things and Remote Sensing techniques are used in different areas to monitor, collect and analyze data from remote locations. This technology is implantable in the water pollution system in this project. Water being an essential need for human survival there must be mechanisms put in place to vigorously test the quality of water available for drinking in any country, town or city articulated supplies surrounding these regions. Due to the vast increase in global industrial output, rural to urban drift and overutilization of land and sea resources, the quality of water available to people has deteriorated greatly. High use of fertilizers in farms and also other chemicals in sectors such as mining and construction have immensely contributed to the overall reduction of water quality globally. Availability of good quality water is paramount in preventing outbreaks of water-borne disease as well as improving the quality of life. The focus of this project is to design and develop a system to enhance control of water pollution and its effects from affecting a larger population. The water pollution detection system will effectively send a notification to the authorities that a specific water catchment area is under pollution. The notifications will always be timely thus being effective in water pollution control. Use case diagram will be used to show representations of users' interaction with the system and thus will effectively portray the relationship between the user and different ways to be employed by the user in solving the water pollution control problem.

**Keywords:** water pollution, system, disease

### Thematic Area 3: Biology and Biotechnology

#### Antimicrobial Activity of Mushroom (*Agaricus Bisporus*) and Fungi (*Trametes Gibbosa*) Extracts from Mushrooms and Fungi of Egerton Main Campus, Njoro Kenya

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#### Abstract

The emergence of drug resistance has caught the attention of scientist due to the risk of going back to the pre-antimicrobial era. This study was carried out to investigate the antimicrobial properties of mushroom (*Agaricus bisporus*) and fungal (*Trametes gibbosa*) metabolites. The study involved isolating *Erwinia spp* and *Ralstonia solanacearum* from infected plants followed by subjecting the isolates and commercially acquired *Staphylococcus aureus* (ATCC 25923), *Enterococcus faecalis* (ATCC 29212), *Escherichia coli* (ATCC 25922), *Pseudomonas aeruginosa* (ATCC 27853), *Streptococcus pneumoniae* (ATCC 49617), *Proteus vulgaris* (ATCC 49990), *Candida albicans*, *Aspergillus niger* (ATCC 1015), *Fusarium oxysporum* (ATCC 16608), *Ustilago maydis* (ATCC 14826), *Microsporium gypseum* (ATCC 15621) and *Malassezia furfur* (ATCC 14423) to antagonism by mushroom and fungal isolates. The study revealed that mushroom and fungi metabolites inhibit growth of the tested pathogens. However, fungi metabolites did not inhibit growth of Gram positive bacteria. In addition, there was no significant difference in inhibition of the bacterial growth by mushroom extracts (P=0.09). However, there was significant growth inhibition of the bacteria by fungal extracts (P=0.00001). In addition, was no significant difference in bacterial growth inhibition between mushroom and fungal extracts (P=0.089). On antagonism of pathogenic fungi, there was no significant difference in growth inhibition of the fungi by mushroom extracts (P=0.24). Contrastingly, there was significant difference in growth inhibition of the fungal pathogens by the fungal extracts (P=0.025) and also in the inhibition of the fungal pathogens by mushroom and fungal extracts (P=0.0022). Mushrooms and fungi produce antimicrobial metabolites that can be exploited in treating diseases that affect man and his plants and animals. This study established that the extracted antifungal metabolites did not inhibit growth in gram positive bacteria. There is need to carry further study to establish the chemical composition of the antimicrobials.

**Key words:** Antimicrobial activity, fungi, mushrooms

## FERMENTATION OF AFRICAN NIGHTSHADE WITH STARTER CULTURES TO IMPROVE SAFETY AND QUALITY

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### Abstract

Africa is endowed with rich varieties of indigenous leafy vegetables which can help to alleviate malnutrition among poor populations. Because of the warm and moist weather, vegetables are prone to faster spoilage. Therefore, proper method of food preservation that is cheap and can be locally available which also ensure product safety and quality is necessary. Fermentation of vegetables with lactic acid bacteria (LAB) has been reported across the world although it is not widely adopted in the fermentation of African indigenous leafy vegetables (AIV). Fermentation of AIV may help improving safety and quality. In this study, 2 different LAB starter cultures were used to ferment African nightshade leaves and their success on reducing background microbiota and to assess the effect of fermentation on nutrient composition. African nightshade (*Solanum scabrum*) was cultivated at MRI and JKUAT for 7-8 weeks. The leaves were harvested, washed, and dried. Fermentation of 1 kg leaves was performed in 5 l pots with the starter cultures *Lactobacillus plantarum* and *Lactobacillus fermentum* in the presence of 3 % salt and 3 % sugar at 25°C for 144 h. The lactate and sucrose concentration were determined after fermentation. Vitamin B<sub>1</sub> and B<sub>2</sub> vitamin C and vitamin E were determined by HPLC analysis while protein or raw nitrogen was evaluated by Kjeldahl method, and the ash determined by furnace method. To determine the success of the applied LAB starters during fermentation, different bacterial isolates were sampled at 0h, 48h and 144h of the experiment. Pure isolates were characterized phenotypically and genotypically with RAPD-PCR profiling and sequencing of 16S rRNA genes. Moreover, the effect of the starter cultures on the background microbiota was investigated by DGGE of DNA amplified using Eubacteria universal primer from the fermentation solution at 0h, 24h, 48h, 72h and 144h. Fermentation of nightshade leaves with LAB reduced the pH below 4 within 24h. The spoilage microorganisms were inhibited after 72 h. Sucrose was metabolized in both starter culture and control batches at 24h and after 48h. Lactate showed an increase after 24h and 72h in both starter culture and control batches respectively this was due to reduction in the pH and increase in LAB counts. While African nightshade had high amounts of vitamins, fermentation seem to reduce vitamin B<sub>1</sub> & B<sub>2</sub>, C and protein while it increased ash contents. Comparison of microbial composition during fermentation by DGGE showed the batch with starter cultures showed stable, continuous pattern while the control patterns appeared more diverse. This emphasizes that the use of LAB starters contributes to a more predictable quality and safety. Preliminary RAPD-PCR results showed the inoculated LAB had different gel profiles with most isolates obtained from starter culture and control batches. Therefore, PFGE strain typing technique will be used to establish clonal relatedness.

**Keywords:** Fermentation, lactic acid bacteria, safety, African nightshade, vegetables

## Developing Management Strategies against Cashew Leaf and Nut Blight

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### Abstract

Thirteen chemical fungicides and adjuvants, 11 fungalspecies and extracts of 12 locally available plants were tested against leaf and nut blight pathogen for the evaluation of inhibition of spore germination and mycelial growth. Among the fungicides tested, all the concentrations of Chlorothalonil 720g/L and Tebuconazole (4.5%) + sulfur (70%) showed 98% inhibition of mycelial growth and Sodium hydroxide recorded the least inhibition. Mancozeb 80% (98%) and Mancozeb 480g/kg + Metalaxyl 100g/kg (96%) showed the highest percentage inhibition of spore germination and Triadimefan 25% + Metalaxyl 20% showed the least inhibition. Plant extracts at the 20, 10 and 5 percentage concentrations were mixed with growth medium and percentage growth was observed. *Miliciaexcelsa* and *Corchorusolitorius* L. extracts showed highest inhibitory effect against leaf and nut blight pathogen. *Opuntia vulgaris*, *Morindamorindoides*, *Moringaoleifera* and *Azidarachtaindica* also showed promising inhibition on spore germination and mycelial growth of leaf and nut blight pathogen.

**Keywords:** fungicides, plant extracts, inhibition, leaf and nut blight.

**Effects of Fertilizer and Fungicide Application Rates on the Incidence and Severity of Late Blight (*Phytophthora infestans*) on Irish Potatoes (*Solanum tuberosum* L)**

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**Abstract**

The effects of fertilizer and fungicide application rates have been demonstrated in the field on potato production. However, the fertilizer rates have not been tested fully to ascertain its effects on incidence and severity of late blight (*Phytophthora infestans*) on irish potatoes (*Solanum tuberosum* L). The objective of this study was to determine effects of N-P-K 17:17:17 fertilizer and Acrobat fungicide (Dimethomorph 90g/Kg + Mancozeb 600g/Kg) application rates on the incidence and severity of late blight on Irish potatoes. The experiment was conducted at Egerton University Field seven and Tumaini farm, in Molo Sub County. This was done in a randomized complete block design in a split split plot arrangement with Kenya sherekea and Dutch robjin potato varieties being used. The pathogen was isolated from infected leaves and tubers and identified in the laboratory. It was then used for in inoculation in the field. The treatments rates were N-P-K 17:17:17 fertilizer at 0, 90, 135Kg/ha-1 and fungicide, Acrobat (Dimethomorph 90g/Kg + Mancozeb 600g/Kg) at rates of 0, 2.5, 3.5g/L. Each potato variety was sprayed with the fungicide three times in intervals of seven days at 47DAP, 54DAP and 61DAP. Fertilizer application was done at planting and 35 days later after emergence at equal splits. Data was collected on percent disease index (PDI) and disease severity index (DSI). Analysis of variance (ANOVA) was conducted and means separated using Tukey's test whenever ANOVA showed significant treatment differences. There was significant ( $P \leq 0.05$ ) difference among the varieties, sites, fertilizer and fungicide levels for disease severity and incidence. The results showed that fertilizer and fungicide application rates had some effects on late blight development under field conditions depending on variety. Therefore fertilizers and fungicides should be used cautiously to reduce incidence and severity of potatoes to late blight. **Keywords:** *fertilizer, phytophthora infestans, solanum tuberosum, fungicide*

## Isolation and Characterization of Probiotic Lactic Acid Producing Bacteria in Kenyan Traditionally Fermented Milk

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### Abstract

Lactic acid producing bacteria are found in decomposing and fermenting plants and milk products. They produce lactic acid as a major metabolic end product of carbohydrate fermentation. Lactic acid producing bacteria in fermented food provide several benefits to the body. Due to their general recognition as safe (GRAS) status they are used in industries as they are very common in food and they contribute a lot to the healthy microbiota of both animal and human mucosal surfaces. In industrial fermented products these LAB is used as starter cultures in products like yoghurt. Kenyan communities such as the Maasai, Kalenjin, Turkana and the Kikuyu ferment their own milk adding different substances which differ from community to community. or most of these communities fresh and fermented milk is a staple part of their diet. These experiments seek to isolate and characterize LAB found in traditionally fermented milk from communities around Kenya and to identify if they are similar to those that are artificially added to industrial milk. Different methods were used to identify lactic acid producing probiotic bacteria in fermented milk including gram staining, catalase tests, sodium chloride tolerance test amongst others in this study. Strains of lactic acid producing bacteria isolated were from Family Lactobacilli and Family Streptococci. The quantity differed from community to community with lactobacilli being the dominant isolate from the Maasai culture and streptococci being more dominant in the Kalenjin isolate. This proved that traditionally fermented milk offers a wider range of lactic acid producing bacteria than industrial starter cultures.

**Key words:** Lactic acid producing bacteria; traditional milk; fermentation

**Control of *Erwinia* spp. isolated from star-of-bethlehem (*ornithogalum* spp.) using actinomycetes and preparation of antiserum using rabbits****Paul Njenga Waithaka<sup>1</sup>, Eliud Mugu Gathuru<sup>2</sup>, Benson Muriuki Githaiga<sup>2</sup>, Silviah Wanjiru Gacau<sup>2</sup>**<sup>1</sup>School of Pure and Applied Sciences, Kirinyaga University, P. O. Box, 143-10300 Kerugoya, Kenya<sup>2</sup>Department of Biological Sciences, Egerton University, P. O. Box, 536 Njoro, Kenya*waithakanj@gmail.com***Abstract**

*Erwinia* spp. causes soft rot in *Ornithogalum* spp., a flower grown purposely for export in Kenya. As a result, the pathogen poses a great risk to the economy of the country. This study aimed at isolating actinomycetes and *Erwinia* spp. from the soils of Menengai crater and infected *Ornithogalum* spp. respectively. In addition, the study sought to produce antiserum against the pathogen using a rabbit. Isolation of actinomycetes from the soil was carried out using standard methods. *Erwinia* spp. was isolated by first sterilizing the plant tissues using 70% ethanol prior to plating using nutrient agar after cleaning the plant tissues using distilled water. Further sub-culturing on nutrient agar was carried out to obtain pure cultures. The obtained *Erwinia* spp. was used in testing for sensitivity using the actinomycetes isolate and in production of antiserum through injection of the antigen intramuscularly into the rabbit. The antiserum was tested against the pathogen using immunodiffusion technique. Five potent actinomycetes, PAN 12, PAN 30, PAN 35, PAN 50 and PAN 60 were isolated from the soils of menengai crater. The *Erwiniaspp.* obtained had typical cultural and morphological characteristics of *Erwinia* spp. Although there was no significant difference in the zones of inhibition of the *Erwinia* spp. by the actinomycetes isolates, PAN 35 indicated the largest zones of inhibition. The antiserum produced had very high potency of controlling *Erwinia* spp. There is need to control *Erwinia* spp. otherwise horticultural farming in general and growing of the flower in particular will be jeopardized.

**Key words:** rabbits, *Erwinia* spp., *ornithogalam* spp.



## Thematic Area 4: Physics and Geophysics

### Evaluation of Reservoir Sub Surface Structures from Pressure Transient Tests in Olkaria Domes Geothermal Field, Kenya

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#### Abstract

The Olkaria Domes Geothermal field is situated in the south of Lake Naivasha, in southern sector of the Kenya Rift system, approximately 120 km northwest of Nairobi city. Geothermal reservoir evaluation involves various kinds of tests, data interpretation and modelling. In this paper multistage pressure transient data from ten deep wells obtained at well completion stage were analyzed for the purpose of obtaining permeability structures. From the results, Injectivity Index ranged from 0.35 lps/bar to 5.56 lps/bar while Transmissivity values ranged from  $7.82 \times 10^9 \text{ m}^3/\text{pa.s}$  to  $5.12 \times 10^{-8} \text{ m}^3/\text{pa.s}$ . Injectivity-Index and Transmissivity contours indicate higher values in the eastern regions of the reservoir indicating good permeability and decreases southwest wards. It is recommended that more production wells be drilled in the eastern region of the geothermal field.

**Key Words:** Geothermal Reservoir, Well Testing, Step Rate Injection

## **A Study of Solar Variability and Its Effects On Earth's Climate**

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### **Abstract**

The Sun provides nearly all of the energy that drives the Earth's climate system. Although understanding the effects of solar variability on Earth's climate change remains one of the most puzzling questions that has continued to attract attention of scientists. The Sun has been observed to vary on all time-scales and there is an increasing evidence that this variation may have an influence on the Earth's climate. Scientists have been trying to get a hand on how much solar energy illuminates the Earth and what happens to the energy once it penetrates the atmosphere. The climate response to these variations can be on a global scale but understanding the regional climate effects is more difficult. In this project research, we study the correlation between solar variability and the climate change over the last 17 years. We make use of solar data from Solar Radiation and Climate Experiments (SORCE) and climate data from Climate Research Unit (CRU). In order to observe how these changes have occurred, analysis of the data was done using GNU-plot and python to show the trend. As an outcome, from the results we explore for the possible correlation linking the solar variability and the Earth's climate change over the 17 years period. Our results show a linkage in the change of the climate factors which can be attributed to, but not completely to the solar variability. Further advances in understanding of the solar variability and its effect on climate is recommended from the ongoing acquisition of high-quality measurements of climate and solar variables. This knowledge is of importance as it can be used to in estimating the past and the future of solar behavior and climate response.

**Key words:** Solar irradiance, Earth's climate, solar variability

## The Design and Simulation of Solar Photovoltaics Cell For Maximum Power Output Using MATLAB/SIMULINK

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### Abstract

Photovoltaic (pv) solar cells convert solar energy into electrical energy. The current solar cells suffer energy losses through cell resistance in metal contacts and undesirable environmental temperatures. This results in low efficiency of the solar cells. Solar pv cell efficiency can be improved by maximizing the available solar potential of a place through optimization of cell internal parameters based on environmental factors. Modelling solar pv cell in MATLAB and parameters analysis criterion was employed to predict a suitable solar cell for Narok region for maximum power output. Simulink library was useful in the realization of the block diagram. The data (irradiance and temperature) employed in the study was obtained from meta data website for Olderkesi region in Narok. Solar-pv cell IV and PV characteristics were simulated under different shunt and series resistance. The results showed that for maximum power output, minimum temperature of about 16°C, series resistance of 0Ω, shunt resistance of above 500Ω should be maintained. We suggest the surface of the pv cell to have a material that has selective absorption properties to realize the predicted temperature of 16°C which gave the maximum output power. This criterion is suitable for modelling pv cell for any region provided temperature and irradiance for that particular region are provided.

**Keywords:** solar cell, modelling, simulation, MATLAB/Simulink

## AB-INITIO STUDY OF THERMOELECTRIC PROPERTIES OF AN $A_2B_2C_2$ MATERIAL FOR WASTE HEAT RECOVERY FOR AN AUTOMOTIVE

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### Abstract

Thermoelectric materials (TEM) convert temperature gradients directly into electricity and vice versa. Approximate 70% of the energy generated by the combustion of fuel in VVTI engine cannot be converted into mechanical energy, but disperses to the environment as waste heat. Reduction of energy consumption and curbing of CO<sub>2</sub> emissions of automotive becomes an important issue. The thermoelectric technology can convert heat into electric energy and improve the fuel efficiency of automotive. This paper studies the thermoelectric waste heat recovery system for automotive. TEM have received renewed interest for waste heat recovery and refrigeration applications. Their outstanding reliability due to the lack of moving parts makes them attractive candidates for a series of applications. However, today's thermoelectric devices are limited by their low efficiency and high costs. The density of states, band structure and figure of merit of AN  $A_2B_2C_2$  material were calculated using computational methods. All calculations on the material were within the Density Functional Theory (DFT) framework and a plane wave basis set as implemented in the Quantum ESPRESSO and VASP codes. The Projector Augmented-Wave pseudopotentials was used to describe the core-valence electron interaction with PBE chosen for the exchange – correlation functional. The temperature dependent properties including thermoelectric transport properties were calculated using VASP code and analysed using the PHONOPY code. A comparison with previous DFT and Experimental studies were done. The figure of merit for the material was found to improve by 5%. The results obtained may lead to fabrication of devices in an automobile that convert waste heat energy to electricity. The  $A_2B_2C_2$  thermoelectric devices obtained can be attached to the exhaust pipe to convert waste heat to electrical energy. The heat from cold side of thermoelectric devices is removed by liquid-cooling cold plate. A design of the heat exchanger of exhaust pipe to harvest heat of exhaust gas to thermoelectric modules effectively can be fabricated. The performance of thermoelectric waste heat recovery system with different designs is comprehensively studied.

**Keywords:** TEM, band gap, figure of merit.

## Estimation of CO<sub>2</sub> Emission Reduction by a PV Power Backup System in Equatorial Climate

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### Abstract

Solar photovoltaic (PV) power systems provide affordable, reliable, clean and sustainable source of electricity for all consumers (small and large scale) and grant them an opportunity to contribute towards decarbonization of electricity generation at individual level. A PV power system can be used as a substitute for a stand-by diesel generator, which is used widely by entrepreneurs and institutions in Kenya to supply electricity during power outages. In addition, resorting to PV backup power system will enable individual consumers to contribute towards achieving SDG Goal 7, and hence supplement government efforts to achieve its set targets before the lapse of the fast-approaching 2030 deadline. PV system is modular, hence can be sized to meet both load and cost demand of each consumer, and has little running cost. In this study, estimation of CO<sub>2</sub> reduction by using a 780 Wp PV power backup system installed at a learning institution in Nandi County is presented. Outdoor performance evaluation on the backup system was done for a period of one year in 2020. Homer Pro software was utilized for the environmental and economic evaluations of the system. Simulation results gave CO<sub>2</sub> mitigation rate of 0.459 tCO<sub>2</sub>/year and environmental cost parameter of \$4.10/annum. This shows that PV backup systems can contribute significantly to the mitigation of CO<sub>2</sub> emissions, and has the potential to drive the current energy transition crisis from diesel generator backup systems in the energy sector.

**Keywords:** PV system, backup systems, CO<sub>2</sub> mitigation, environmental cost

## Thematic Area 5: Health

### Preparing For The Next Pandemic: The Need To Re-Evaluate The NHIF

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#### Abstracts

The Covid-19 Pandemic has been a major disruptor, due to lockdown measures many Kenyans have lost their jobs, business is no longer thriving. Many families are struggling to put a meal on the table. Even more painful is the refusal of the social health insurer (NHIF) to cover any cost related to Covid-19 diagnosis, treatment, and hospitalization. This is an abdication by the state from its core duty which is to protect life. As a result, many Kenyans who cannot afford to pay for their treatment even after diagnosis, have opted to go home and die. Further, the viability of NHIF has been put into question. Although the government has made significant efforts to ensure Kenyans access health insurance cover, concerns have been raised regarding the equity, efficiency, feasibility the sustainability of NHIF. Lack of transparency is a major challenge. It spends funds without any outside checks and balances. In addition to that, the NHIF board has been subjected to wrangles. In recent times members of the board have engaged in public squabbles. The board suffers from a lack of independence. Its members do not enjoy the security of tenure. Political interference is one of the biggest challenges facing NHIF. The Kenyan government is fixated with enrolling more citizens in NHIF schemes and injecting huge amounts of money, however, little attention is paid towards the changes needed to make the health insurer efficient. The unending mismanagement of NHIF has eroded public confidence. During a pandemic, an efficient social health insurer plays an important role in cushioning citizens who have lost their jobs from plunging into further abject poverty and disillusionment. The time has come for Kenyans to interrogate the efficacy of NHIF and reform it. This is the best way to prepare for future pandemics. Therefore, this researcher intends to dig deep into the internal systems of NHIF such as memos, by-laws, administrative notifications, procedures, statutory and institutional regulations to expose the mischief, flaws, and loopholes in the legal structure of NHIF. Thereafter, a well thought, argued and researched remedy shall be suggested that will necessitate a complete overhaul of NHIF in line with the best international practice.

**Key words:** NHIF, law, pandemics

**Health Impacts of a Traditional Illicit Brew (Kaanga) Consumed in  
Meru County, Kenya**

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**Abstract**

Kaanga brew is a common illicit liquor from Meru county in Kenya. Popularity of this brew has been growing and is religiously passed down from one generation to the next. The substrates, preparation process and additives used in making it are unhygienic and toxic. As a result, numerous social and health effects have stemmed from its consumption. This study aimed at analyzing the health impacts arising from consumption of Kaanga brew in Meru county, Kenya. A cross-sectional design of study was employed. The research tools used included questionnaires, interviews and observations. Descriptive statistics was used to analyze and present the findings. The results indicated that popularity of this brew was mainly because it was cheaper than other alcoholic beverages. Its consumption was projected to continue for a long period, if strict intervention measures are not taken. The additives used, such as battery acid, methanol and dry cells were indeed toxic for human consumption. Several social effects which had public health effects (such as irresponsible sex activities), by extension were experienced from the consumers. Kaanga brew had significantly more chances ( $P > 0.05$ ) of causing health effects compared to the other brews. Some of the direct health conditions arising from its consumption include loss of vision, memory and appetite, inflammation and regular stomach upsets. 80% of the respondents had witnessed or heard of a death case caused by the brew.

**Keywords:** Kaanga illicit brew, Meru county, health impacts



**Assessment of School-based HIV Programs Aimed at Optimizing HIV Care and ART Adherence in Kisii County Kenya**

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**Abstract**

In Sub-Saharan Africa, there were an estimated 3.0 million children living with HIV in 2018 and there were about 200,000 HIV-infected children in Kenya alone. Achieving viral suppression and good health outcomes depends on maintaining a high level of adherence to ART to maximize clinical effectiveness and limit potential for development of drug resistance.<sup>3</sup> Maintaining high-level ART adherence in children in resource-poor settings and preventing drug resistance is especially important because only two lines of ART are available. HIV-infected children face several potential barriers to ART adherence, as adherence is a complex behavior and is affected by many factors, including developmental stage, knowledge of HIV status, health and nutrition, caregiver characteristics, and sociocultural characteristics. However, the role schools play in influencing ART adherence and health outcomes in HIV-infected children is poorly understood. Given the fact that children spend a significant amount of time in schools, the social environment and support systems in schools, or lack thereof, have the potential to have a significant effect on pediatric ART adherence and health outcomes. Thus, the role schools play in providing support to HIV-infected children must be examined. Policies and guidelines established by the Kenyan Ministry of Health (MOH) mandate that schools fulfill certain responsibilities related to HIV, including providing information on HIV/AIDS and sexually transmitted infections (STIs) in their curriculum. With respect to HIV-infected children, the only requirements set by the MOH are that schools promote peer support and HIV/AIDS counseling through trained counselors and facilitate access to ART. These requirements are relatively broad and leave schools. A school-based assessment done in Kisii County, revealed, that there is need to optimize HIV care and ART in School going children.

**Key words:** School, HIV, Care

## **Influence of Flexible Work Scheduling on Performance of Nurses in Regional Hospitals in Tanzania**

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### **Abstract**

The health care industry is tremendously important to people around the world as well as to the national economies. The delivery of modern health care depends on groups of trained nursing professionals coming together as interdisciplinary teams. Research evidence suggests the performance improvement among nursing staff and its potential effect on the healthcare industry is of paramount importance. Despite availability of flexible working arrangements in the public hospitals to enhance the productivity of the health care personnel, nurses' performance in most public hospitals remain wanting. To create high performance work attitude among the existing staff and to attract potential new entrants, healthcare organizations have to adopt HRM strategies that would help them in performance improvement. This study aimed at identifying the influence of flexible work scheduling on performance of nurses in regional hospitals in Tanzania. The study also examined the intervening role of leadership support in mediating the relationship between flexible work scheduling on performance of nurses. Specifically, the study examined how job compressed working, flextime and shift working influenced performance of nurses in hospital settings. Guided by explanatory research design, the study adapted a positivism study philosophy. Data were collected from 381 nurses in 8 regional hospitals using structured questionnaires and in-depth interviews. The findings indicated a significant correlation between compressed working, flextime and shift working with nurses' performance ( $r=0.513$ ,  $p<0.05$ ). Also, the study found that, leadership support and flexible work scheduling explained 52% of nurses' performance. It was finally concluded that nursing work scheduling was affected by staffing levels, rigid working practices but also by the design of the nurses' work system. This paper suggest ways in which hospitals can improve nurses' performance by increasing flexibility in working practice, reorganizing work structure to respond to the uncertainty in patient-care needs while respecting work rules.

**Key words:** Flexible working practices, Employee performance, Nursing shortages, Nurse scheduling, Quality health care

## Antimicrobial Resistance Profiles of Selected *Enterobacteriaceae* Contaminating Raw Beef from Retail Butcheries in Kakamega Town, Kenya

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### Abstract

Meat has been the main source of protein foodstuff globally since ancient times to date. However, it should not harbour disease causing agents. Its high nutritive value has been found to hasten microbial growth. To determine antimicrobial resistance profiles of selected *Enterobacteriaceae* (*E. coli*, *Shigella sp.* and *Salmonella sp.*) isolates from raw beef samples.

**Design:** This was a cross-sectional study to determine antimicrobial resistance profiles of bacteria isolated from raw beef using disk diffusion, minimum inhibitory and bactericidal concentrations methods. Further, the determination of their ability to form biofilms in the presence of commonly used antibiotics was deduced. Statistical analysis techniques such as descriptive statistics and chi-square test of homogeneity were used for data analysis. Raw beef samples were obtained from selected 54 retail butcherries in Kakamega town, Kenya and laboratory analysis of samples was done at Masinde Muliro University microbiology laboratory. Out of the 1296 samples collected, 548/1296(42.3%) were contaminated with *E. coli*, 80/1296(6.17%) with *Salmonella sp.* and 20/1296(1.54%) with *Shigella spp.* Among the 548 *E. coli* strains sensitivity to quinolones differed (nalidixic acid-486/548 and ciprofloxacin-535/548), and all the strains were sensitive to chloramphenicol and ceftriaxone, 72.6% of the *E. coli* isolates were sensitive to gentamicin, 21% to streptomycin, and 89% to kanamycin. About, 70 (87.5%) strains of *Salmonella* species isolated were sensitive to all the drugs though some [10 (12.5%)] were resistant to cotrimoxazole, ciprofloxacin and nalidixic acid. All the 20(100.0%) isolates of *Shigella sp.*, were sensitive to all the drugs tested in this study. Raw beef samples were found to be contaminated with enterobacteriaceae. *E. coli* was the main contaminant isolated, also major antimicrobial resistant isolate. The study recommends stringent hygiene measures on butcherries and personnel handling meat.

**Keywords:** Contamination, Antimicrobial, *Escherichia coli*, *Shigella sp.*, *Salmonella sp.*, beef, Microbial.

***Mycobacterium Tuberculosis* detection techniques on sputum in Kisii-Kenya**  
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**Abstract**

The laboratory diagnosis of pulmonary *tuberculosis* and smear-negative pulmonary tuberculosis in resource limited countries are often based on X-ray and sputum smear microscopy. These diagnostic tools require experts, have long turnaround time, and cannot detect resistance to Tuberculosis (TB) drugs and TB in individuals with Human immunodeficiency virus. Recently there was development of *GeneXpert MTB/Rif* assay that has a short turnaround time and can detect resistance to *rifampicin* among TB patients but its utility has not been evaluated in Kenya. This study investigated the comparative sensitivity and specificity of smear microscopy and culture relative to *GeneXpert MTB/Rif* assay among suspected TB patients. A cross-sectional study was conducted in Nyamira County Referral Hospital among suspected TB patients and both results recorded. Culture for *Mycobacterium tuberculosis* served as the reference standard. The results of this study showed that among 682 enrolled participants, 182(26.69%) were diagnosed TB positive while 500 (73.31%) no TB. *GeneXpert mtb/rif* had a higher *sensitivity* (100%) and *specificity* (99.4%) relative to culture and a positive predictive value of (98.4%) and a negative predictive value of (100%). Smear microscopy revealed low sensitivity (26.4%) and a higher specificity (98.2%). A concordance analysis of smear microscopy and *GeneXpert* was done. The findings revealed a significant (patients showed resistance to either one of the TB drugs (*rifampicin, isoniazid and Ethambutol*) while none of the enrolled patients were resistant to streptomycin. In conclusion *Gene Xpert MTB/Rif* test had high sensitivity compared to smear microscopy. For rifampicin resistance detection, it provided accurate results. My recommendation to the Division of TB and lung diseases is to roll out the Gene Xpert mtb/rif machines to all health care facilities.

**Keywords:** *Gene Xpert* assay; *Mycobacterium tuberculosis*; HIV; Smear microscopy

Nurses' knowledge regarding intravenous fluid therapy at a County hospital in Kenya

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**Abstract**

Increased morbidity and mortality among hospitalized patients receiving intravenous (IV) fluids is an issue of global concern. These associated negative outcomes are mainly due to inadequate knowledge of IV fluid therapy among healthcare workers leading to errors in prescribing, administration and monitoring. Notably, quality healthcare is a major pillar of the Vision 2030 national blueprint and the Big 4 agenda in Kenya, and the global Sustainable Development Goals. With the COVID-19 pandemic, the World Health Organization has provided guidelines on IV fluid therapy in COVID-19 patients with acute respiratory failure recommending cautious administration and meticulous monitoring for associated complications. Because nurses are the cornerstone of infusion therapy, their knowledge of this subject is critical in mitigating this unintentional patient injury in the course of healthcare. A cross-sectional survey of 52 staff nurses in medical and surgical wards was conducted using a validated 10-item questionnaire to measure nurses' knowledge of basic aspects of IV fluids, including classification, ionic composition, indications, administration, monitoring, and related complications. The data were analyzed using SPSS version 21. Overall, the mean knowledge score on IV fluid therapy among nurses was 57.4% ( $SD = \pm 28.55$ ), depicting moderately adequate knowledge. Adequate knowledge was present in only 12% of the participants, whereas 23% had inadequate knowledge. Knowledge deficiencies were highest regarding the ionic composition of intravenous fluids. A positive correlation was observed between nurses' knowledge and previous further training on intravenous fluids ( $p < .001$ ), level of education ( $p < .001$ ), and ward ( $p = 0.03$ ). Strategies to promote patient safety and outcomes during IV fluid therapy involve regular training of nurses, formulation of policies and standard operating procedures to guide practice, and regular assessment of knowledge and skills through written tests and direct observation, for the validation of competency.

**Key words:** nurses, intravenous fluid therapy, County hospitals

## Microbial Analysis of Common Selected *Enterobacteriaceae* Contaminants of Raw Beef Sampled from Selected Retail Butcheries in Kakamega Town, Kenya

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### Abstract

Microbial beef contamination is a significant cause of food spoilage, disease and economic losses. The current study aimed at determining the prevalence and characterization of selected enterobacteriaceae bacteria that are common contaminants of raw beef meat. A cross-sectional study was done that involved collection of 1,296 meat samples from 54 selected butcheries in Kakamega town, Kenya. Meat samples were prepared for isolation and culturing using appropriate and established techniques. After Gram staining and culturing, biochemical tests were also done as confirmatory tests. The study further characterized the various pathotypes of *E. coli*. Statistical analysis techniques such as descriptive statistics and chi-square test of homogeneity were used for data analysis. Samples were obtained from selected 54 retail butcheries in Kakamega town, analysis was done at Masinde Muliro University microbiology laboratory. The study deduced that out of the 1296 samples collected, 548/1296(42.3%) were contaminated with *E. coli*, 80/1296(6.17%) with *Salmonella sp.* and 20/1296(1.54%) with *Shigella spp.* The common pathotype was EPEC (30%) being the most dominant followed by ETEC (24%), EHEC (9.8%) and EIEC (6.2%). Our findings demonstrate that meat sold in Kakamega town is contaminated. *E.coli* pathotypes found to harbour virulent genes. The findings of this study will give an insight into the possible pathogenic strains of bacteria contaminating beef meat retailed in butcheries in Kakamega town and also their virulence so as to ascertain its safety.

**Keywords:** Isolates, Beef, Pathotypes, *Enterobacteriaceae*, Butcheries

**Treatment Compliance Among Women with Pregnancy Induced Hypertension Attending Selected Health Facilities In Rachuonyo North Sub-County, Homabay County, Kenya**

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**Abstract**

Treatment compliance among pregnant women with pregnancy induced hypertension (PIH) continues to be a major global health challenge. Maternal and infant mortality and morbidity remain high and PIH is one of the leading causes. However, very little has been achieved to bring this condition under control and many mothers and newborns continue to die or suffer many complications. The main objective was to assess treatment compliance among women with PIH in Health Facilities within Rachuonyo North Sub-County Homa-Bay County. The specific objectives were to establish the effect of socioeconomic factors, knowledge level of women with PIH, health system factors on treatment compliance among women with PIH. A cross sectional descriptive study was undertaken targeting reproductive women (15-49 years) who were pregnant and already diagnosed with PIH in selected Health Facilities. Questionnaires, FGD guides and KII were used for data collection. Two doctors, two clinical health officers and two Nurses were used as key informants. Chi Square and logistic regression assessed the association between the variables. The level of treatment compliance among women with PIH stood at 18.3%. Among the women with PIH, 68.1% had high knowledge on treatment compliance. Socio-demographic factors that were significantly associated with treatment compliance were age (p-value =.007) and education level (p-value =.038). On the health system factors; explanation of PIH during diagnosis (p-value =.001), advice on the importance of PIH medications (p-value=.025), explanation on timing medications (p-value =.024) and follow-up frequency (p-value =.001) were significantly associated with treatment compliance. Education level was the only significant factor that could predict treatment compliance (p-value =.05). The findings is useful for planning and designing appropriate intervention by the Ministry of Health, Non-governmental organization and stakeholders in creating awareness about treatment compliance among pregnant mothers with PIH so as to avert the trend and prevalence of Pregnancy Induced Hypertension.

**Key words:** Pregnancy, Induced, woman, Hypertension, Health



**Poor communication eats a good response strategy**

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**Abstract**

Despite consistent, concerted and practical efforts by several ministries under the leadership of the ministry of health, the spread of coronavirus seems to be on the rise in Kenya. Local communities seem to resist all interventions and even reject testing, yet it's the most effective way to detect spread. Experts warn that even if reduction in infections is achieved, there is no guarantee that the country will respond better, were a fourth wave to occur. Reduced or end-game infections are likely to be conception of new problems such as discrimination, community ostracisation, entrenchment of poorly coded and delivered information, likely less factual. The absence of a well-choreographed well understood, well acknowledged and well-adopted communication strategy proves to be the disconnection between state and the public. This has caused slow adoption of much-needed behaviour change amongst the people, similarly motivated government to adopt more militarized approaches such as lockdowns, curfews and stay home orders that largely mock human rights partially. If we model infectious diseases communication strategy on public health management protocol, with a clear standard operating procedure(s) that deliberately integrate community understanding of the disease including their preferred mitigation approaches we will not only improve acceptability of vulnerability amongst local communities, but achieve messaging that permeates the local psyche of managing pandemics, build better information, education and communication materials and likely reduced opportunities for recurrence due to discrimination and other socially invincible drivers.

**Key Words:** Communication strategy, community, Pandemic

## **Influence of Devolved Procurement Governance Structure On Service Delivery in The Public Health Sector in Kenya**

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### **Abstract**

The purpose of the study was to establish the influence of devolved procurement governance structure on service delivery in the public health sector of the County government of Trans Nzoia, Kenya. The study was anchored on sequential theory of decentralization and adopted embedded mixed methods research design. The target population was 663 respondents comprising of 15 administrators, 16 doctors, 50 clinical officers, 240 nurses and 342 patients' care givers in all the 74 public health care facilities in the County government of Trans Nzoia. Stratified random sampling technique was used to select 331 respondents comprising of 8 administrators, 8 doctors, 19 clinical officers 148 nurses and 148 patient care takers and patients were sampled from 74 public health facilities for study. Data was collected using questionnaires, checklist and document analysis guide. Validity of data collection instruments was determined by experts and peers, and the tool modified accordingly after a pilot study in the neighboring Bungoma County. Reliability was established using test re-test technique, thereafter reliability coefficient was calculated using Pearson product moment correlation. Data was analyzed using frequencies, percentages, means, standard deviation, Spearman rank order correlation, simple linear and multiple regressions. Data was presented using tables, charts and graphs. The study established that implementation of devolved procurement governance structure significantly influenced service delivery in the public health sector in the County government of Trans Nzoia. However, the level of implementation of devolved governance structure was low thus affecting delivery of services in the health sector. The study recommended recruitment of competent procurement practitioners to handle procurement of goods and services in the health sector. Management of health facilities should also ensure that the constitution of procurement committees encompasses a professional mix to ensure departmental needs are addressed.

**Key words:** Devolved Procurement Governance structure, Service Delivery in the Health Sector

## Thematic Area 6: Chemistry

### Extraction and Characterization of Green Surfactants from Fruits of *Solanum Incanum* and *Solanum Aculeastrum*

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#### Abstract

In Kenya there are plants which produces a lot of fruits, and juices from these fruits have been used traditionally as; soaps materials for washing clothes and other cleaning purposes, and as medicinal ointments. The efficacies, quantities and qualities of these fruit juices has remained unknown to date. The general objective of this study was to extract green surfactants from fruits of *Solanum incanum* and *Solanum aculeastrum* and explore their properties and applications in the modern settings. The processing of these bio-surfactants involved, solvent extraction under controlled conditions of temperature, time, pH, solvent to feed ratio and properties of the feed material such as composition and particle size. Characterization was done for pH, surface active agents, metal cation and conductivity of the surfactants using pH meter FTIR, and conductivity meter respectively. Determination of the surfactant concentration levels using emulsification stability method. Agar disk-diffusion method was used to screen the in vitro antimicrobial activity of the extracted fruits surfactant. The percentage yield of the fruits surfactants was >50%, with *Solanum incanum* having highest of 65.063%. FTIR analysis showed the presence of saponin functional groups. UV-Vis analysis confirmed high concentration of saponins in the fruits of *Solanum aculeastrum* than *Solanum incanum*. The surfactants produced a stable foam reaching a maximum percentage height stability of 92.883% for the ripe fruits of *Solanum aculeastrum* and the scum formed was stable even after 3 days. The fruit surfactants inhibited the growth of both *E. coli* and *Candida albicans*. The results confirmed potentially high surfactant activity of the fruits extracts, indicating a promising future commercial applications and farming of these plants as cash crops.

**Keywords;** Biosurfactants, Surface active agents, surfactant activity cash crops, Saponins.

## One-pot synthesis of Novel isoxazoline, pyrazoles, bypyrimidine and Oxime templates and their antimicrobial activity

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### Abstract

Novel isoxazoline, pyrazole, oxime and bypyrimidine analogues have been synthesized from the flavonoids of *Polygonum senegalense* and *Psiadia punctulata* as starting material. Both isoxazolines and pyrazoles are known to possess a wide range of biological activities. The isoxazoline derivative, 2-(4,5-dihydro-5-phenylisoxazol-3-yl)-5-methoxybenzene-1,3-diol (**1**), was successfully synthesized by a reaction of a chalcone with hydroxylamine hydrochloride. A reaction between a flavone and hydrazine hydrate (excess) in ethanol afforded a pyrazole, 5-methoxy-2-(5-(2,3,4,5-tetramethoxyphenyl)-1*H*-pyrazol-3-yl)benzene-1,3-diol (**2**). The oxime (**3**) was obtained by reacting 1',4'-dihydroxy-6'-methoxychalcone chalcone with hydroxylamine hydrochloride. The synthesis of bypyrimidine, 4,5-dihydro-6-(2,4-dihydroxy-3,6-dimethoxyphenyl)-4-phenylpyrimidine-2-(1*H*)-thione (**4**) was accomplished by the reaction of  $\square\square\square$ -unsaturated chalcone with thiourea. The structure proofs were provided by ESIHRMS,  $^1\text{H-NMR}$ ,  $^{13}\text{C-NMR}$  and DEPT analyses. Compound **1** exhibited anti-fungal activity showing  $1\text{C}_{50}$  values of 7.56, 8.01, 8.01 and 13.74  $\mu\text{g/ml}$  against *S. aureus*, *C. neoformans*, *C. krusei* and *C. glabrata* respectively. The compound also exhibited anti-leishmanial  $\text{IC}_{50}$  activity value of 33.98  $\mu\text{g/mL}$  against *Leishmania donovani*. The other analogues demonstrated insignificant anti-fungal and Antileishmanial activities against standard strains. Compound 1 was, therefore, found to be a potential lead for fungal diseases and leishmaniasis.

**Key:** pyrazole, isoxazoline, oxime, bypyrimidine

## Natural Radioactivity and External Dose Rates In Tailing Samples From Rosterman Gold Mine, Kakamega County, Kenya

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### Abstracts

The gold mine tailings over the past have reported naturally occurring radioactive materials (NORM) which have posed adverse radiation risks to the immediate population though there is no proper documentation on the levels of radioactivity and associated hazardous impact on the Rosterman population. In this article, documented results of natural radionuclide concentrations in tailings at Rosterman gold mine, Kakamega county, Kenya were evaluated. The study sampled thirty tailing samples from Rosterman gold mine tunnels, samples were then oven heated at a temperature of 105°C and then crushed by using mortar and pestle. Samples were then sieved and packed in 200 ml plastic bottles for 28 days to attain secular equilibrium. One at a time, the samples radioactivity measurements was done by using the NaI(Tl) detector coupled to necessary electronics with pre-installed software at the physics laboratory in Kenyatta University. The activities of <sup>238</sup>U, <sup>232</sup>Th and <sup>40</sup>K was found to vary from  $39 \pm 1.63$  Bq/Kg to  $118 \pm 4.43$  Bq/Kg,  $72 \pm 2.24$  Bq/Kg to  $223 \pm 8.36$  Bq/Kg and  $85 \pm 3.6$  Bq/Kg to  $362 \pm 10.65$  Bq/Kg respectively. Radium equivalent activities were found below 370 Bq/Kg in all the collected samples. External gamma dose rates estimated from the levels of radionuclides in sediments had a range of  $32 \pm 3.4$  nGy/h to  $68 \pm 5.83$  nGy/h. Hence, mining of gold at Rosterman has minimal significant health implications to the general population and the miners.

**Subject Area:** Nuclear Physics

**Key Words:** Radionuclides, Gamma Ray Spectrometry, External Gamma Dose Rate, Rosterman Gold Mine

**Time-course analysis of chemical and physical properties of organic fertilizer from *Tithonia diversifolia* leaves**

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**Abstract**

Application of *Tithonia diversifolia* leaves as organic fertilizer is common in most rural regions in Africa. There is usually time period for curing between preparation and application stage. However, this curing period leads to reduction in fertilizer efficiency. This study aimed at analyzing the change in functional groups, particle morphology, size and elemental composition from preparation and application stages of *T. diversifolia* leaves as organic fertilizer. The fertilizer was synthesized from *T. diversifolia* leaves. The synthesized fertilizer was stored at room temperature and pressure conditions for a grace period of 5 days; as is norm. Characterization of the samples at the two stages was done by FT-IR (functional groups), SEM (morphology), TEM (particle size) and EDS (elemental composition). The results indicated reduction or complete loss of amine groups and carboxylic groups over this period. The fertilizer particles agglomerated over the storage period. Particle size increased from 112 nm to 133 nm diameter. There was a significant variation in the elemental composition between preparation and application time of the fertilizer samples. These findings prompt for better storage techniques to be used or reduction in curing and storage period of the fertilizers to minimize loss of plant nutrients. This study seeks to address the national big 4 agenda on Food Security and SDG 2 on zero hunger.

**Key words:** *T. diversifolia*, Organic fertilizer, Preparation, Application stage

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**Analysis of the Catalytic Behavior of *Osyris Alba* Bark and *Indigofera Amabelacensis* Leaves  
Extract in Ethanoic and Lactic Fermentation**

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**Abstract**

Fermentation process naturally occur spontaneously though the process is quite slow. To optimize on fermentation process, high temperature systems and enzymes are used. However, these processes are quite expensive and lead to increased production costs. This is notwithstanding the importance attached to fermentation process in food, diary, baking, brewery, pharmaceutical, chemicals and biofuels synthesis. *Osyris alba* bark and *Indigofera amabelacensis* leave extracts were traditionally used to hasten saccharification and fermentation of biomass during preparation of communal alcohol. This study aimed at exploiting the potentials of these two extracts in catalyzing ethanoic and lactic fermentation at ambient temperature conditions. The extracts were fused into maize and sorghum flour (ethanoic) and milk (lactic fermentation) in 1.5-liter batch reactors. The reactors were monitored for 30 days while closely assessing the amount of CO<sub>2</sub> gas produced. The products were qualitatively screened by Iodoform and Benedicts methods as well as infra-red spectroscopy. The products were quantitatively analyzed by ultraviolet-visible (UV-VIS) spectroscopy and gas chromatography (GC) techniques. The results indicated that the catalyzed samples generated 3-to-5-folds more CO<sub>2</sub> gas compared to the control samples. These findings were supported by the qualitative tests done which showed the catalyzed samples began producing ethanol and lactic acid before the control samples. The catalyzed lactic fermentation setup produced more lactic acid (2.79µg/L) compared to the control one (1.48µg/L). Catalyzed ethanoic fermentation setups yielded 11.55% (sorghum) and 2.16% total ethanol while the control samples had negligible ethanol concentrations at similar conditions.

**Keywords:** Fermentation; bio-catalysts; *Osyris alba*; *Indigofera amabelacensis*; ethanol; lactic acid

**The influence of Bomet red rock powder on composite organic fertilizers prepared from *Tithonia diversifolia* leaves and *Musa acuminata* (banana) stalks**

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**Abstract**

Common organic composite fertilizers lack several bio-chemical and physical traits desirable in other fertilizers. This study aimed at investigating the role of Bomet red rock, BRR powder in improving green composite fertilizers from *Tithonia diversifolia* leaves and *Musa acuminata* stalks. The composite fertilizer without BRR powder was prepared by mixing the crude extracts of the two plants before addition of BRR powder (10% wt.) The composite fertilizer with and without the powder were analyzed for physical-chemicals, functional groups, surface, morphology, particle size, crystallinity and chemical composition. BRR powder was proven to boost the fertilizers pH, conductivity and solubility in water while reducing its loss on ignition value. Carboxylic and amide groups were sequestered while imprinting silica and ferric groups onto the fertilizer surface. BRR agglomerated the composite fertilizer particles, in the process smoothening the edges while reducing the particle sizes. The structure of the fertilizers changed from monoclinic to hexagonal with the dominant potassium alumino-silicate phase being replaced by silica upon addition of BRR. BRR powder was therefore found to positively affect the green composite fertilizer and should thus be used in preparation of quality and durable green compound fertilizers. This study seeks to address the national big 4 agenda on Food Security and SDG 2 on zero hunger.

**Keywords:** Bomet-red-rock; green composite fertilizer; *M. acuminata*; *T. diversifolia*



**Characterization and Evaluation of Antifungal and Phytochemical Activities of *Senna Didymobotrya* Leave Extracts**

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**Abstract**

Conventional antifungal agents are expensive with numerous side effects. *Senna didymobotrya* plants are known to possess antifungal potential as extensively used by the people of central Kenya in the treatment of ringworm (*Tinea capitis*). The main aim of this study was to analyze the most expound bioactive compounds present in this plant's leaves crude extracts and determine its antifungal potency. Solvent extraction was done using water, methanol, chloroform, ethyl acetate and n-hexane solvents. The extracts were characterized for physical-chemical parameters, bio-metals, functional groups, phytochemicals and antifungal properties. Both water and methanol extracts were neutral while the rest of the extracts were slightly acidic. The extracts showed appreciable conductivities with methanol ( $123.05 \pm 2.88 \text{mS}$ ), water ( $73.43 \pm 34.85 \text{mS}$ ) and more solubility values at 25°C. The infrared spectra of the compounds indicated presence of carbonyl groups, alcohols, organometallic compounds and halides. All the *S. didymobotrya* leaves extracts contained essential bio-metals in considerable concentrations. Flavonoids, phenolic compounds and alkaloids were the most pronounced phytochemicals present, especially in methanol and water extracts. The chloroform and ethyl acetate extracts had the highest of mycelial growth inhibitions in the leaves extracts, (16mm and 15mm respectively). In conclusion, water, methanol and chloroform extracts were found to be more suitable for medicinal applications.

**Key words:** Antifungal agents; *Senna didymobotrya*; Leaves extracts; *Tinea capitis*

## Synthesis and characterization of aluminium oxide nanoparticles from waste aluminium foil and potential application in aluminium-ion cell

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### Abstract

Aluminium waste accumulated in landfills is a solid waste in abundance. Various methods have been employed to alleviate the waste only to yield secondary pollution effects. This study seeks to provide an alternative greener recycling procedure that is beneficial to society in terms of health and economics through energy storage materials. The study aimed to synthesize and characterize aluminium oxide nanoparticles from waste aluminium foil and its potential applications in fabricating aluminium-ion cell, FAIC.<sup>1</sup> Aluminium oxide nanoparticles were obtained by co-precipitation of waste aluminium foils at constant annealing room temperature followed by mechanical milling to nanoparticulate range. The particles were then characterized for particle size and phases (X-ray diffraction), functional groups and optical activity (infra-red and ultra-violet-visible spectroscopy respectively). Cell assembling of FAIC was done using a graphite anode while the cathode had a standard and the synthesized aluminium oxide nanoparticles. Sulfuric acid and magnesium sulfate electrolytes were used with two binders; polyacrylate and silicone adhesives. The average synthesis yield was  $40.64 \pm 19.69\%$ . Most of the particles had a  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> and  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> phase with an average size of 63.763 nm and 66.5144 nm for the two polymorphs respectively. There were several OH-groups coupled to Al–O bonds. The optimal absorption peak was  $\lambda_{max} = 237$  nm corresponding to a band gap of 5.25eV. The synthesized nanoparticles exhibited great electrochemical potential, nearing the standard one in most of the parameters. The FAIC potential, current, power densities and polarization curves from sulfuric acid electrolyte and polyacrylate binder were significantly higher to those of magnesium sulfate and silicone binder ( $P > 0.05$ ). This study seeks to address the national agenda on manufacturing and SDG 7 on affordable and clean energy.

**Keywords:** Aluminium wastes, Al<sub>2</sub>O<sub>3</sub> nanoparticles Aluminium-ion cell

## Extraction and Characterization of *Zanthoxylum chalybeum* Crude Extract for Phytochemicals and Elemental Analysis

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### Abstract

This study aimed at analyzing the bark and seeds extracts of *Zanthoxylum chalybeum* (popular for numerous medicinal properties) for heavy metals (Fe, Zn and Cu), secondary metabolites and for FTIR analysis. *Zanthoxylum chalybeum* bark and seeds extracts were collected, air dried then crushed into powder. The samples for phytochemical analysis were extracted using deionized water and diethyl ether and it was found that the bark contained alkaloids, saponins, tannins phlobatannins, phenols, terpenoids, cardiac glycosides, reducing sugars and anthraquinones in both deionized water and diethyl ether extracts. In the seed, alkaloids, saponins, tannins, phlobatannins, phenols, cardiac glycosides, reducing sugars and anthraquinones were present. The samples for heavy metal analysis were oven-dried, and digested using the wet method and heavy metals were analyzed using Atomic Absorption Spectrophotometry Technique. Iron in the bark extract was found to be  $3.820 \pm 0.0001$  ppm and  $0.578 \pm 0.0001$  ppm in the seed extract. Zinc was  $0.643 \pm 0.0001$  ppm in the bark and  $1.431 \pm 0.0001$  ppm in the seed extract and finally, copper was found to contain a concentration of  $0.373 \pm 0.0001$  ppm in the bark and  $0.370 \pm 0.0001$  ppm in the seed extract. The samples for FTIR analysis were oven-dried, mixed with KBr, crushed into thin pellets and run in the FTIR machine. The bands at  $1743.65\text{cm}^{-1}$  and  $1681.93\text{cm}^{-1}$  indicated a C=O stretching which implies the presence of a Ketone compound, at  $1512.19\text{cm}^{-1}$  and  $1465.90\text{cm}^{-1}$  indicated a C=C-C, aromatic ring showing the presence of aromatic compounds. The band at  $137.89\text{cm}^{-1}$  indicated OH bend, alcoholic group implying the presence of phenols and tertiary alcohols. The bands at  $1087.85\text{cm}^{-1}$  and  $1033.85\text{cm}^{-1}$  are due to  $\text{PO}_3$  stretch showing the presence of phosphate ions. These phytochemicals show the ability of the bark and seed extracts of *Zanthoxylum chalybeum* to contain various medicinal properties.

**Key words:** Phytochemicals, medicinal properties, *Zanthoxylum chalybeum*

**Characterization of Bio-active Compounds Essential for Blood Coagulation in the Crude Extracts of *Tradescantia zebrina*, *Tagetes minuta* and *Codiaeum variegatum* Leaves**

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**Abstract**

Many commercial drugs used for blood clotting are expensive and have associated side effects. The extracts of *Tagetes minuta*, *Codiaeum variegatum* and *Tradescantia zebrina* are used for blood clotting. These extracts are highly efficient and have no known side-effects. This study aimed at characterizing crude extracts of these plant species used to accelerate blood clotting. An independent measures experimental design was used in the study. Place and duration of study: The research was conducted between 21st September, 2018 and 21st May, 2019. The study was conducted in Maasai mara university, Kenya and Multimedia university of Kenya. Extracts of these herbs were obtained and analyzed for absorption bands, functional groups, bio-metal concentrations, physical-chemical parameters, phytochemicals and antimicrobial activity. Test for blood clotting factors (calcium and vitamin K) was also conducted. All extracts had common functional group peaks at 2800-3500  $\text{cm}^{-1}$  (carboxylic OH), 1680  $\text{cm}^{-1}$  (carbonyl), and 1035  $\text{cm}^{-1}$  (C-O stretch). The extracts had an average pH of  $6.590 \pm 0.702$  and conductivity of  $0.580 \pm 0.079 \text{ mS}$ . The average solubility in distilled water was  $16.670 \pm 1.534 \text{ g/100 ml water at } 37^\circ\text{C}$ . The extracts were found to be abundant in iron, copper and phytochemicals. All extracts portrayed moderate inhibition to *E. coli* bacteria and *C. albicans* fungi but mild inhibition towards *S. aureus* bacteria. The extracts had trace amounts of Vitamin K and moderate amounts of calcium.

**Keywords:** Blood clotting; *Tradescantia zebrina*; *Tagetes minuta*; *Codiaeum variegatum*.

**Extraction and Characterization of Natural Pesticides from Extracts of *Lippia javanica***

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**Abstract**

The long-term application of synthetic insecticides has resulted in residues accumulating in different environmental components. The residues have consequently led to increased environmental pollution, adverse effects on non-target organisms, ecosystems, and human health. Green pesticides have been posted as an alternative to synthetic insecticides in public health sectors. The study focused on the prospects of *Lippia javanica* leaves crude extracts as a green pesticide for insect pest management. Preliminary results showed to have insecticidal, fumigant and repellent activities against mosquitoes. *Lippia javanica* leave extracts are complex chemical compounds with multiple modes of action that enhance their activity due to the synergistic action between constituents. The volatility and solubility of *Lippia javanica* leave extracts were studied, which play an essential role in the *Lippia javanica* activity, application and formulations. The extracts were characterized for physical-chemical parameters, functional groups, phytochemicals and active compounds (organophosphate, carbamates and organochlorides). The results showed the pesticide samples were slightly acidic and quite volatile. There was the presence of carbamates and organophosphorus peaks in the spectra of the samples. The results indicated an abundance of carbamates in the test samples. The test samples showed the presence of terpenes which are essential oils in repelling mosquitoes. Leave extracts were found to have high pesticidal activity.

**Keywords;** green pesticides, *Lippia javanica*, mosquito

**GC-MS Analysis of *Vernonia thomsoniana* Extracts and Antibacterial Potentiating Effects on standard Antibiotics**

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**Abstract**

The search for plant derived therapeutic agents against drug resistant bacteria has been intensified in recent years. *Vernonia thomsoniana* chloroform and ethanol crude extracts were subjected to phytochemical screening and subsequently tested for antibacterial activity, alone and in combination with standard antibiotics (Sparfloxacin and Ciprofloxacin). GC-MS analysis was carried out on chloroform extract to determine the chemical composition. The antibacterial activity ranged from 20-23 mm for the crude extracts. The chloroform extract exhibited highest zone of inhibition against *S. aureus* and *E. coli* (23 mm). The MIC of the extracts ranged from 2.5-5 mg/mL. The antibacterial effect of combining standard antibiotics with extracts showed that Ciprofloxacin was potentiated by chloroform extract against *E. coli* (34 mm) as the most effective antibacterial inhibition. The MIC of the combination of extracts with the antibiotics ranged between 2.5-0.313 mg/mL. GC-MS analysis on chloroform extract resulted to identification of compounds, with n-hexadecanoic acid (18.8 %), 9, 12-octadecadienoic acid (Z,Z) (8.8 %), 9,17-octadecadienal, (Z) (5.5%) and nonane (5.1 %) as most abundant components. Thus, fatty acid esters could be responsible for the potent activity of chloroform extract. Our study showed that the combination of standard antibiotics such as Ciprofloxacin with the extracts could provide notable treatment properties for developing effective antibacterial agents.

**Keywords:** *Vernonia thomsoniana*, antibacterial activity, drug combination, GC-MS

## Thematic Area 7: Statistics

### Efficiency Test Between MLE and MDE Fitting Techniques

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#### Abstract

From the past studies, we realized that minimum distance estimation technique is not commonly used for fitting wind speed data to a distribution yet it is believed to be the best alternative for Maximum Likelihood Estimation (MLE) method which is known to give accurate estimates than Least Square Estimates (LSE) and Method of Moments (MOM). To achieve this, the study aims at fitting data to a probability distribution using maximum likelihood estimation and minimum distance estimation techniques to find the best and efficient distribution. The study uses wind speed data from five sites in Narok county namely; Irbaan primary, Imortott primary, Mara conservancy, Oldrkesi and Maasai Mara University. The best wind speed distributions were examined using the Cullen and Frey graph and a suitability test on the models done using Kolmogorov-Smirnov statistical test of goodness of fit. The wind speed data are fitted to the recommended distributions using maximum likelihood estimation and minimum distance estimation techniques. The best distribution was identified using Akaike's Information Criterion (AIC) and Bayesian Information criterion (BIC) and efficiency was investigated using relative efficiency. The study concludes that MLE is the efficient estimation technique and gamma distribution with three parameters is the best and efficient distribution for fitting wind speed data with the three parameters given as; threshold parameter of 0.1174, shape parameter of 2.0718 and scale parameter of 1.1209.

**Key Words:** Efficiency test, wind distribution, speed

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## Triangulation Analysis of the Effect of Taxation Policy on Revenue Collection Performance by Kenya Revenue Authority

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### Abstract

The main objective of the study was to analyze the effect of government taxation policies on revenue collection in Kenya Revenue Authority (KRA) by examining the effect of policies governing staff training, internal controls, tax incentives and tax regulations on revenue collections in KRA. The study was based on human capital theory, systems theory, optimal theory of taxation and economic deterrence model. The study applied mixed design including descriptive survey design triangulated with secondary data and correlation research design. The target population comprised all the revenue officers working in the 34 KRA stations in the six regions across the country. The study sampled a total of 313 revenue officers in 34 KRA stations. Questionnaires containing close ended was used in the collection of primary data. The collected data was analyzed using statistical package for social sciences (SPSS) version 24 computer software. Descriptive statistics (frequencies, percentages, means and standard deviations) as well as inferential statistics (correlation analysis and regression analysis) were used in data analysis. Data was presented in charts and tables accompanied by relevant discussions of the findings. The study established that staff training, internal control mechanisms, tax incentives and tax regulations all had significant positive relationship with revenue collection. Further, regression analysis demonstrated that the independent variables taken together significantly accounted for 43.9% of the variation in revenue collection. When the results were triangulated with secondary data, the results were the same in staff training, internal control and tax incentive policies. Results from triangulated data had slight change on the relationship between tax regulation policy and revenue collection which turned out to be insignificant. The researcher had confidence to believe the consistent results of the main epistemological and ontological positions which of both the primary and secondary data on effects of government taxation policies on revenue collection by Kenya Revenue Authority. The study recommended that the government through the treasury devise policy guidelines to inform on the training of KRA staff in regard to revenue collection. Further the top management in KRA should devise internal control mechanisms to aid in monitoring the operation of the organization. On the other hand, the treasury in conjunction of KRA management board should put in place policy framework for the coming up and implementation of tax incentives.

**Key words:** Tax collection Performance, Human Capital Development, Tax Internal Control Management, Tax incentives management and Tax Regulation Practice.



**FITTING WIND SPEED TO A PROBABILITY DISTRIBUTION USING MINIMUM DISTANCE ESTIMATION TECHNIQUE**

**BY**

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**Abstract**

From the past studies, we realized that minimum distance estimation technique is not commonly used for fitting wind speed data to a distribution yet it is believed to be the best alternative for Maximum Likelihood Estimation (MLE) method which is known to give good estimates than Least Square Estimates (LSE) and Method of Moments (MOM). To achieve this, the study aims at fitting data to a probability distribution using minimum distance estimation techniques to find the best distribution. The study uses wind speed data from five sites in Narok county namely; Irbaan primary, Imortott primary, Mara conservancy, Oldrkesi and Maasai Mara University. The best wind speed models were examined using the Cullen and Frey graph and a suitability test on the models done using Kolmogorov-Smirnov statistical test of goodness of fit. The wind speed data are fitted to the recommended distributions using minimum distance estimation techniques. The best distribution was identified using Akaike's Information Criterion (AIC) and Bayesian Information criterion (BIC). From the distribution comparison for the two and three parameter distributions, gamma is the best in all cases. Gamma with three parameter distribution gives lower AIC and BIC values and model comparison test showing that gamma 3parameter is the better than gamma with 2-parameters. The study concluded that gamma distribution with three parameters is the best distribution for fitting wind speed data with the three parameters given as; threshold parameter of 0.1174, shape parameter of 1.8646 and scale parameter of 0.9937.

**Key words:** Wind speed, probability distribution

## **Thematic Area 8: Food Security**

### **Performance Appraisal Practice Opportunity and Employee Retention In Selected Beverage Processing Firms In Kenya**

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#### **Abstract**

The rate of employee turnover can affect the performance of an organization and therefore employee retention is considered of utmost importance globally. Hence this study aimed to investigate the influence of performance appraisal practice on employee retention in selected beverage processing firms in Kenya. The study was conducted using survey design to establish the relationship between variables. The target population was 2940 employees of beverage firms in Kenya and the sample size was 352 employees which was calculated using Taro Yamane's formula. The study adopted structured questionnaires to get answers of the research questions. Questionnaires were used to collect data and later on analysed using descriptive statistics and presented in frequency tables. The pilot study was carried out at Kipchabo tea factory in Nandi County. It was established that performance appraisal practice showed a positive correlation with retention of employees in beverage processing firms. The study recommended that the management of organizations should put in place performance appraisal policy, gives performance appraisal feedback timely and should be conducted on regular bases to enable management and employees to plan for better execution. The study recommended that issues should be addressed so that to prevent employees from perceiving performance appraisal systems as discriminatory, punitive and judgmental processes, where cronyism and biased considerations dominated objectivity and thus ineffectiveness of the appraisal system. Lastly, the study was to be of great significance to beverage processing firms, academicians, researchers and policy makers.

**Keywords:** performance appraisal practice, employee retention, beverage processing firms

**INFLUENCE OF POST-HARVEST TECHNOLOGY ON FOOD SECURITY IN NAROK EAST SUB-COUNTY,  
KENYA**

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**Abstract**

Crop yields have decreased globally due to declining investments in research and infrastructure as well as increasing water scarcity which are preconditions for global food security. By the year 2016, an estimated 120,000 people in rural areas and 30,000 in urban centers of Narok County were food insecure. This has attributed to a mismatch in food availability, accessibility and utilization. The purpose of this study was to establish Influence of Post-Harvest Handling on Food Security in Narok East sub-County, Narok County, Kenya which like other counties in the ASAL areas experience cases of food insecurity. The specific objective of the study sought to establish influence of post-harvest handling on food security in Narok East sub-County, Kenya. The study adopted human capability approach. A descriptive research design was adopted by the study. The target population comprised of 25078 households distributed proportionally in the 4 wards and are involved in different farming activities. A sample of 378 household heads was determined using the sample size determination formula by Krejcie and Morgan (1970). Furthermore, 1 sub-county crop officer and 4 ward extension officers were used in the study and hence it was a census. The total number of respondents for the study was 383. Primary data was collected using a questionnaire and an interview guide. Data analysis was done using descriptive statistics of frequencies, percentages and inferential statistics of correlation, ANOVA and regression analysis. Statistical Package for Social Sciences software version 26 and the Excel software were used as data analysis tools for the study. The results was presented using frequency and percentages, tables and charts. The relationship between the variables was tested at a significant level of 0.05. The results show that there is a strongly positive and significant correlation between post-harvest technology and food security in the sub-County ( $r = .606^{**}$  and  $p\text{-value} = 0.000$ ). This implies that the relationship between the variables is very significant hence post-harvest technology is a strong determinant of food security in the study area. The study concludes that the null hypothesis that there is no relationship between post-harvest technology and food security was rejected because the ANOVA model indicated a very significant and statistical relationship between the two variables. The study will be beneficial to the farmers in the ASAL areas who have consistently experienced food insecurity. The study will also benefit the National Government, County Governments and other Non Governmental Organizations in the area of food security as it will provide appropriate data that will be used for policy making.

**Key words:** Arid and Semi-Arid areas, Food security, Post-Harvest Technology, Narok East sub-County,

## **Influence of Freight Management on Performance of Food and Beverage Manufacturing Firms in Kenya**

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### **Abstract**

In the current 21<sup>st</sup> century, there has been an increase in changes in the business environment that have forced large-scale enterprises to realign their global strategies and manufacturing activities, and flatten their hierarchies in order to speed up information flows. Food and beverage manufacturing companies in Kenya have been experiencing problems in the performance of their production and operations management. In view of the foregoing, it is relevant to investigate how Kenyan organizations could outsource their logistics requirements through freight management in the most efficient manner with regard to customer service and cost. This study therefore, sought to assess the influence of freight management on the performance of food and beverage manufacturing firms in Kenya. Based on the role played by policies and governance in the supply chain processes, this study also sought to assess the moderating effect of policy and governance framework. The study was informed by the logistics theory. A descriptive research design was adopted. Food and beverage manufacturing companies were sampled and the data was collected using self-administered questionnaires and analyzed using descriptive and inferential statistics. The findings revealed that freight management had a significant influence on the performance of food and beverage processing firms. Policy and governance framework was also found to insignificantly moderate the relationship between freight management and performance of food and beverage processing firms. The study concluded that freight management was critical in enhancing the performance of food and beverage processing firms in Kenya. The study recommends that the management of food and beverage processing firms ought to embrace a freight management framework in order to gain performance.

**Keywords:** Freight Management, Policy and Governance Framework, Food and Beverage Manufacturing Firms, Firm Performance

**Post-harvest Practices of Maize Farmers in Trans Nzoia, Kisii, Kisumu, Bungoma, Migori, Kericho, Machakos, Kitui and Meru Counties, Kenya and isolation of mycotoxin producing fungi from maize samples.**

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**Abstract**

Mycotoxins produced by fungi are among the leading courses of human mortality and morbidity all over the world. This study aimed at establishing the post-harvest practices that lead to contamination of maize with fungi in Trans Nzoia, Kisii, Kisumu, Bungoma, Migori, Kericho, Machakos, Kitui and Meru Counties in Kenya. The study was also aimed at isolating the most common mycotoxin producing fungi from maize samples collected from the study areas. The post-harvest practices were determined using a questionnaire. From each county, a total of 130 maize samples were collected. The samples from each county were mixed to make a composite sample. The moisture content of the maize samples were determined and percentage moisture content calculated. Each sample was ground using a dry mill kitchen blender (BL335, Kenwood, UK). A sample of 1g was suspended in 9mL of sterile distilled water and serial dilution up to  $10^{-2}$  carried out. A sample of 0.01mL was plated on potato dextrose agar. Mycotoxin producing fungi were identified using morphological characteristics and fungal identification keys. The post-harvest practices within the counties varied significantly. The mean moisture content of stored maize varied from 16.78% in Kitui to 19.33% in Trans Nzoia. The number of mycotoxin producing fungi ranged from 10.33 CFU/g in Machakos to 61.00CFU/g in Trans Nzoia. This study established that the post-harvest practices observed in the study areas led to contamination of maize with mycoflora. In addition, the moisture content levels of stored maize in the counties favoured growth of mycotoxin producing fungi. There is need to identify the mycotoxins produced by the mycotoxin producing fungi isolated in this study.

**Key words:** mycotoxins, food security, maize

**Breed and Social Economic Factors Influencing Smallholder Dairy Cattle Productivity in Tigania  
East Sub-County, Kenya**

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**Abstract**

A survey in Tigania East Sub County, Kenya was carried where structured questionnaires were administered to 156 respondents, spread out in 3 agro-ecological zones. The study objectives were to establish social-economic and breeding factors influencing milk productivity. There were 87.2% male respondents. About 89% were married and 93% had post primary education. About 40% had monthly incomes between 100-200 US dollars. Only 27% of respondents mentioned dairy farming as their major source of income. About 78.4% owned 1-2 dairy cows. Farmers' experience in dairy farming averaged 11.8 years. Regression analysis showed that education levels, family income, decision maker on dairy farming, major farming activity involved and experience in dairy farming were the significant ( $p < 0.05$ ) social economic factors influencing milk productivity. While usage of artificial insemination, type of semen breed, breeding service, and quality of breeding bull used were the breeding factors that significantly ( $p < 0.05$ ) affected milk productivity. Improving on these significant factors would help improve dairy industry in the study area.

**Key words:** dairy, breed, social economic

## Evaluation of the Efficacy of Botanical Pesticides for Fall Armyworm Control in Maize Production in Kenya

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### Abstract

Fall armyworm (FAW) belongs to the group of Noctuidae that causes significant damage to maize, rice, sorghum and other crops. FAW has caused the highest monetary losses in agriculture worldwide. Since its emergence in Africa in 2016, FAW has spread rapidly and poses a severe threat to the food security and livelihood of millions of smallholder farmers in the African continent. *Terminalia brownii* and *Prosopis juliflora*, *Nicotina tabacum* and *Ajuga spp* leaf extracts were compared to Cypermethrin insecticide for FAW control in maize. A Randomized Complete Block Design (RCBD) with four replications of maize variety "H 624" maize variety were used as a test crop. Ten FAW larvae were artificially introduced into the maize two weeks after planting followed by an application of insecticides for seven weeks after 20% infestation. Analysis of variance showed a significant difference ( $p < 0.01$ ) in maize yields between the controls and all the treatments but not among the four treatments. Cypermethrin (92%) extract caused the highest reduction in the leaf damage, followed by *N. tabacum* (87.5%), *P. juliflora* (75%), *Ajuga spp* (70%) and *T. brownii* 52.8%. The highest larval mortality was obtained from Cypermethrin (80%) and *N. tabacum* (80%), followed by *Ajuga spp* (60%), *P. juliflora* (60%) and *T. brownii* (40%). It was concluded that the three botanicals' extracts were as effective as control measure for the FAW and recommended as an alternative method for FAW control among small scale farmers.

**Keywords:** *Spodoptera frugiperda*, , Efficacy, Maize, Botanicals pesticides

**Opportunities and barriers to mango production and upscaling activities in the context of climate change in Elgeyo Marakwet County, rural Kenya**

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**Abstract**

Climate change continues to expose rural communities in Kenya to more vulnerable living conditions. Kenya contributes approximately 1.7% of global mango production and is the leading mango producer in the East Africa region. In rural Kenya mango farming supports over 60,000 rural households. Mango farming is a climate sensitive agricultural activity since it depends on rain fed cultivation. This study contributes to the limited empirical evidence on communities which depend on rain fed agriculture and their experience of, and responses to, climate change. This study investigated the opportunities and barriers to mango production and upscaling activities in the context of climate change in Rokocho community, Elgeiyo Marakwet County Kenya. Household surveys and focus group discussions were used to capture data on socio-economic farmers' profiles, opportunities, barriers and challenges. Results indicates that mango farmers have access to quality seedlings, market, cheap labour and group membership. Pests and diseases, water shortages and limited arable land were identified as the main barriers to mango production. The findings suggest that there is need to address the constraints reported by households to ensure that the advantages from mango farming are utilized and a continued resilience to future climate change is assured.

**Keywords:** *Climate change, Rural community, Barrier, Opportunity*



## Isolation of fungi from maize samples collected from selected Counties in Kenya

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### Abstract

Maize is the staple food in Kenya. However, its production has been jeopardized by the high prevalence of fungi in most developing countries and the whole world at large. Some fungi produce mycotoxins which threaten human lives. This study aimed at isolating fungi from selected Counties in Kenya. Maize samples were ground using a kitchen blender and cultured on Potato Dextrose agar at 28°C for 7d. The fungal isolates were identified using morphological and cultural characteristics. Data was analyzed using Statistical Package for Social Sciences (SPSS) version 25.0 software. The number of fungal isolates from the selected counties varied significantly ( $F=1.987$   $P=0.0484$ ). The fungal isolates presented different morphological and cultural characteristics. The mean fungal isolates between the selected counties varied significantly ( $F=1.877$   $P=0.0474$ ). In addition, the number of spores obtained from maize stored in baskets, polypropylene, jute and polythene bag varied significantly ( $F=3.815$   $P=0.03945$ ). This study established that maize in the selected Counties is highly contaminated by pathogenic fungi. The most prevalent fungal spp. were *Aspergillus*, *Penicillium* and *Fusarium*. The best maize storage material for maize were baskets. There is need of identifying the most prevalent fungi up to the molecular level.

**Key words:** food security, maize, storage

**Effects of aligning strategic decision making on the sugar industry in Western Kenya**  
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**Abstract**

Decision making is the essence of management, it is what managers do or try to avoid. All managers worldwide would like to make good decisions since they are judged on the outcomes of those decisions. Strategic decisions aim at gaining some advantage for the organization over competitors as well as a search for strategic fit with the business environment. In addition to environmental factors, strategic decisions are also affected by organizational values and expectations of those who have power in and around the organization (founder members and other key stakeholders). The decision making process promotes reduction of waste on non-productive activities such as shirking, excessive executive remuneration, perquisites, asset-stripping, tunneling, related-party transactions and other means of diverting the organization 's assets and cash flows. It also results in lower agency costs arising from better shareholder protection, which in turn engenders a greater willingness not to accept lower returns on their investment

**Key words:** Strategy, Strategic decisions, Strategic fit.

**Influence of Supplier Development on Organizational Performance in Food and Beverage Manufacturing Companies in Kenya**

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**ABSTRACT**

Supplier performance can affect the competitive advantage of food and beverage manufacturing companies globally. Hence, this study aimed at determining the influence of supplier development on organizational performance in food and beverage manufacturing companies in Kenya. Transaction Cost Theory, and Supply Chain Management Theory informed this study. The target population was 534 respondents comprising of 217 procurement managers and 217 procurement officers from 217 food and beverage manufacturing companies in Kenya. Using Yamane's formula, a sample size of 230 respondents was selected. Simple random sampling was used to get the sample for the study. Purposive sampling was used to get top procurement personnel in the manufacturing firms. Primary data was collected by the use of a questionnaire with close ended questions. Secondary data was collected through empirical review of studies done in this field. The reliability coefficient of the questionnaire was assessed by using Cronbach's Alpha. Content validity of the instrument was determined using expert judgment. Analysis of data was done using descriptive, correlation and regression analyses. Findings were presented using tables. Supplier development was found to have significant positive relationship with performance of food and beverage manufacturing companies in Kenya. The study concluded that supplier development positively influences the performance of food and beverage manufacturing companies in Kenya. The study recommends that the managements of food and beverage manufacturing companies in Kenya should ensure that supplier development at all levels of the organization is enhanced so that it can contribute to competitive advantage of the firm.

**Key words;** Supplier development, organizational performance, food and beverage manufacturing companies

## Thematic Area 9: Supply Chain Management & Procurement

### Influence of Supply Chain Resilience on The Performance of Disaster Relief and Humanitarian Aid Organizations in Kenya

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#### Abstract

The purpose of this study was to explore the influence of supply chain resilience on the performance of disaster relief and humanitarian aid organizations in Kenya. The study was anchored on the Complex Adaptive Systems Theory and employed survey research design. The study was a census survey of the 330 disaster relief and humanitarian aid organizations carrying out their operations in Kenya. Objectively developed questionnaires were used to collect primary data. Descriptive statistics and inferential statistics was used aided by SPSS version 24 to facilitate data analysis. Inferential data analysis was done using Pearson Correlation Coefficient and regression analysis. The data was presented using a combination of statistical and graphical techniques. The study concluded that supply chain resilience had a positive significant linear influence on performance of disaster relief and humanitarian aid organizations in Kenya. The study revealed that for humanitarian aid organizations to overcome the vulnerabilities and disruptions affecting their supply chains there is need to embrace utilization of local resources by raising funds from local businesses, individuals and government. Further the study established that humanitarian organizations use business continuity frameworks to predict shortcomings and develop procedural retaliation and recovery plans to guard important proficiencies against the potentially devastating effects of extended scarcity. To build on supply chain resilience, humanitarian aid organizations should strive to make local capacity building an essential field in emergency response where partnerships bring together knowledge and humanitarian experience in a working relationship that is collaborative, risk sharing and one that involves the affected populations to avert, alleviate and prepare for disasters. The study also recommends the use of outsourcing, spare capacity and use of local suppliers to mitigate against humanitarian supply chain vulnerabilities.

**Keywords:** Supply Chain Resilience; Humanitarian Supply Chains; Supply Chain Vulnerability, Supply Chain Robustness, Supply Chain Flexibility

## **Sustainable Supply Chain Practices and Competitive Advantage In The Horticultural Sector In Kenya**

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### **Abstract**

Agriculture being the main economic activity and contributor to the country's GDP, fruits and vegetables takes the bigger percentage of the agricultural productivity. Competitive advantage in this sector is key in enhancing sustainability and performance of the sector. The study therefore seeks to address the influence of sustainable supply chain management on the competitive advantage in the horticultural industry in Kenya. Specifically, the study sought to find out the relationship between green purchasing and competitive advantage in the horticultural industry; establish the relationship between reverse logistics and competitive advantage in the horticultural industry; and analyse the moderating effect of value addition on the relationship between sustainable supply chain and competitive advantage in the horticultural industry. The study adopted several theories to support the specific objectives which are transaction cost economies theory, institutional theory, theory of reasoned action, diffusion innovation theory and stakeholder theory. The study adopted a descriptive research design while the target population was 236 horticultural firms in Nairobi Kenya. A census was used whereby all the 236 firms included in the study. Questionnaire was used to collect the study data while the data was analysed through mixed analysis where both qualitative and quantitative techniques was used. Inferential analysis was used to establish the relationship between variables. The data was presented in form of tables and figures. The study found a positive relationship between green purchasing and competitive advantage in the horticultural industry in Kenya. Also, further reverse logistics had a positive influence on competitive advantage in the Horticultural Industry in Kenya. The study recommends that the management of the horticultural companies should improve on their green purchasing practices. This can be done by applying flexible sustainable supply chain practices through research so as to understand the changing environmental needs and remain relevant in the market. The study also recommends that the companies should ensure that their reverse logistics are properly structured. This would ensure that customer needs are met, ensuring customer loyalty and making it difficult for competitors to imitate simple services that are geared towards value creation and the environment.

**Keywords:** Competitive Advantage, Green Purchasing, Horticultural Industry, Green Distribution, Sustainable supply chain, Value Addition

## Moderating Effect of Environmental Uncertainties on the Relationship between Risk Hedging Supply Chain Strategy and Performance of Manufacturing Firms in Kenya

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### Abstract

The manufacturing sector in Kenya is faced with challenges of underperformance and unstructured supply chain strategy. Further, studies have shown that, the manufacturing sector growth in 2014 was 3.4% compared to a 5.6% growth in 2013. This slow growth in manufacturing sector performance can be attributed to several environmental uncertainties such as the general election, high production costs, supply disruptions, political stability, unavailability of raw materials or demand fluctuations, technological changes, employees' strikes, financial risk, terrorism and competition from imported goods. The purpose of the study was to determine the moderating effect of environmental uncertainties on the relationship between risk hedging supply chain strategy and performance of manufacturing firms in Kenya. The study utilized descriptive research design. The target population was 829 managers from manufacturing firms around the country. A sample of 270 managers was selected using stratified random sampling. Results indicated that risk hedging supply chain strategy explained 63.8% of the total variations in performance of manufacturing firms. In addition, risk hedging supply chain strategy had a positive and significant effect on firm performance ( $\beta=0.675$ ,  $P < .000$ ). With introduction of moderating variable (environmental uncertainties); risk hedging supply chain strategy explained 34% of the total variations in performance of manufacturing firms. This denoted those environmental uncertainties had a negative moderating effect on the relationship between risk hedging supply chain strategy and performance of manufacturing firms in Kenya. The study concluded that, risk hedging supply chain strategy had a positive and statistically significant effect on performance of manufacturing firms in Kenya. The study further showed that, environmental uncertainties lower the effect of risk hedging supply chain strategy on firm performance. The study recommends that, manufacturing firms should strengthen aspects related to risk hedging supply chain strategy. The firms should particularly strengthen safety stock, suppliers' management and quality. The improvement of these aspects is expected to enhance performance of the manufacturing firms. This study further recommends that manufacturing firms should factor in environmental uncertainties related to demand, supply and technology when implementing supply chain strategies.

**Keywords:** *Environmental Uncertainties, Risk Hedging Supply Chain Strategy, Performance, Manufacturing Firms*

## Strategic Supplier Relationship on Performance of Devolved Systems of Government in Kenya

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### Abstract

Organizations have striven to cut down cost, in order to increase profits so as to gain competitive advantage this is realized through strategic procurement practices which helps an organization gain a competitive advantage through its contribution to the strategic goals of an organization and its ability to significantly increase performance and productivity. The purpose of this study was to investigate the influence of strategic supplier relationship on the performance of the devolved system of government in Kenya, the study adopted a cross-sectional survey design using both quantitative and qualitative approaches. The target population for this study was all 47 counties. The sample size was 10 counties namely; Garissa, Kisii, Nyamira, Narok, Marsabit, Murang' a Bomet, Nairobi, Kiambu and Homa Bay. The study used stratified random sampling to pick 186 respondents from finance and procurement department. Data was collected by using questionnaires Descriptive and inferential statistics were used aided by Statistical Packages for Social Sciences version 24 to compute percentages of respondents' answers. Hypothesis testing was carried using multiple regression analysis and standard F tests. We found out that a positive and significant relationship between strategic supplier relationship and performance of devolved systems of government. We recommend that devolved systems of government should conduct jointly product development with suppliers and involve suppliers directly or indirectly in their strategic plans. Suppliers' involvement would support the company's development innovation and capabilities thus increasing the benefits perceived by the company's customers. Finally, we recommend that management should implement strategic supplier relationships practice within the frameworks of public procurement acts and regulations.

**Key words:** devolved systems, strategic supplier relationships, counties



## Public Participation in Contract Administration for Sustainable Procurement Management in Devolved System of Governments in Kenya

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### Abstract

The Public Participation framework, 2013 in Kenya under the 47 county governments envisages stakeholders to participate in community-based infrastructural projects through involvement in procurement planning, monitoring and evaluating project performance, risk management, contract management and policy making process. It envisages a sustainable approach to project management. Purchasing and supply management professionals can only deliver sustainable procurement through ongoing engagement and collaboration with internal stakeholders, budget holders and key suppliers to reach the most effective solution. Contract management is a multi-stage process that goes on through the entire duration of the contract and ensures that the parties meet their contractual obligations in order to deliver the specific objectives provided in the contract. The study adopted a descriptive survey design to assess the influence of contract administration on sustainable procurement management. A Sample of 348 respondents identified through Slovin's formulae was drawn from a target of 1146 in Makueni, Machakos and Kitui Counties through stratified sampling method. Data was collected using a semi structured questionnaire. Collected data was analyzed through descriptive and inferential statistics. The results indicate that, the community is involved in contract administration to a great extent through; supplier identification, project negotiations, actual supplying of local available materials and ascertaining compliance to contractual terms and conditions by the contractors. The study concludes that there is significant positive relationship between contract administration and Sustainable procurement management. The study recommended that, both national and county governments in Kenya need to promote public participation through contract administration to achieve high sustainable procurement management levels in community-based infrastructural projects.

**Key words:** Contract, Devolution, Public participation, Public procurement, open government, green procurement, Sustainability.



## **INFLUENCE OF PROCUREMENT ETHICS ON THE PERFORMANCE OF DEVOLVED SYSTEMS OF GOVERNMENTS IN KENYA**

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### **Abstract**

The purpose of this paper is to examine the influence of procurement ethics on the performance of devolved systems of governments in Kenya. A cross-sectional approach is adopted with primary data collected. The data yielded a response rate of 229 from 10 devolved systems of governments Kenya which were drawn mainly from supply chain and finance departments. The data collected was put through rigorous statistical analysis to test content validity as well as reliability. Further, simple linear regression model was used to test relationships between procurement ethics and the performance of devolved systems of governments in Kenya. The finding proposes that a successful execution of procurement ethics increases the performance of devolved systems of governments through efficiency management of public resources, fair competition in bidding process and provision of all the required information in the bidding processes. Further, the study revealed that some devolved systems of governments sliced tenders to avoid appropriate procurement process. The study provides relevant knowledge in formulating policy framework on efficient and effective management of public procurement process in devolved systems of governments. Also, the study show that procurement ethics if properly embraced, it will increase the performance of devolved systems of governments but not all procurement ethics practices are covered in the study and therefore a similar study can done in different sector to validate the findings. The study provides a holistic approach in the application and use of procurement ethics for improving performance of devolved systems of governments. Also, the identified gaps provide future direction in research and encourage the adoption of procurement ethics as a way of instilling good morals in the devolved systems of governments.

**Key words:** Procurement ethics, Performance of devolved systems of governments in Kenya, Simple regression

## Building Resilient Supply Chain Through Strategic Supplier Partnership For Food Security Realization In Kenya: Engaging Agricultural Food Authority

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### Abstract

The Kenyan Government through the leadership of his Excellency President Uhuru Kenyatta launched Food security as one of the Big Four Agenda which with the contribution of the food supply chain participants mainly focus to eradicate the perennial Food security that has been transmuting Kenyans population for long. Thus, this study development focuses the replication to regime initiative through the adoption of strategic supplier partnership resilience concept, with the position of postulating the best practices to drive operational efficiency along the food chain. The study-concrete targets examines the direct contribution of supplier evaluation, supplier segmentation and supplier development which, via using literature review and development of resilience framework, can be Anchorage in the Food Supply Chain for operational efficiency. The investigation grounds the pertinence of Social network theory. The study engages 380 respondents drawn from the directorates running under the management of Agriculture Food Authority in Kenya. The tool for data collection is development of structured questionnaires administered to employees. Multiple regression statistical approach is used to analyze inferential data with the aid of Statistical package for social sciences. The model derived in the study is congruous for fostering food security and thus enhancing perpetual food chain improvement and hence operational efficiency. The study delimitation to particular practices limits the inferences and therefore future studies should exhaustively consider on identifying other possible strategic supplier partnership interventions which have the potential of ascending operational efficiency and expand the chances of the Government meeting the Big Four Agenda and Vision 2030. The paper is of scholarly value and engenders value integration to policy makers and extensively practitioners in food supply chain industry

**Keywords:** Operational efficiency, Food security, Resilience, Supplier partnership, and Supply chain

**Relationship Between Supplier Relationship Management and Implementation Level Of Public Procurement Regulatory Framework In The Devolved Governments In Kenya**

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**Abstract**

The purpose of this study was to establish the relationship between supplier relationship management and implementation level of public procurement regulatory framework in the devolved governments in Kenya. The study adopted census because of the small size of the population. A structured questionnaire was used as a data collection tool. The study also undertook a pilot test on the instrument's reliability and validity in the 3 counties; Nyamira, Kisii, Homa-Bay Counties where nine (10) respondents were engaged in the pilot study. The use of descriptive and inferential statistics for data analysis was considered. Study engaged the key informers from the 44 county Governments who positively responded hence achieving 100% response rate. The statistical tests were also done in the study. Presentation of data was in form of charts and tables as deemed appropriate. The findings obtained indicated that there was significant relationship between supplier relationship management on level of implementation of public procurement regulatory framework in the devolved governments in Kenya. The findings were found to be positively significant. The findings indicated that for every unit of supplier relationship management the value of implementation level of public procurement regulatory framework in the devolved governments in Kenya changes with a positive significance increase in the presence of a moderator. The study recommended that the devolved governments functions should embrace supplier's commitment level on quality of goods and services in their operations such as information sharing between the buyer, improve on their commitment on suppliers' payment, increase commitment level in supplier partnership and development to improve the supplier's commitment level and value addition or creation in service delivery.

**Key words:** Supplier Relationship Management, Public Procurement, Regulatory Framework Devolved Governments

## Influence of supplier relationship management on performance of manufacturing firms in Kenya

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### Abstract

The main objective of this study was to investigate the influence of supplier relationship management on performance of manufacturing firms in Kenya. This study employed descriptive research design. The targeted population of this study is comprised of 499 manufacturing companies which are all located in Nairobi and its environs. In order to come up with a representative sample, stratified random sampling method was used since the population is heterogeneous. The stratified technique ensured that each sector in the target population has an equal chance of being selected. There were 217 respondents sampled from the 499 manufacturing firms out of 217,180 respondents returned the questionnaires for analysis. The study adopted a descriptive survey design. Data was collected using self-administered questionnaires which were tested for validity and reliability using 10% of the total sample respondents. Quantitative data was analyzed using both descriptive and inferential statistics and with the help of SPSS version 23 while qualitative data was analyzed descriptively. Linear and multiple regression models were used to show the relationship between the dependent variable and the independent variables. The information was presented using tables, charts, frequencies, percentages and graphs. The study established that there exists a positive influence of supply relations management on performance management of manufacturing firms in Kenya at 5% level of significant ( $\beta=0.295$ ,  $P<0.05$ ). This indicates that as the level of supplier relationship management increases also performance of manufacturing firms in Kenya increases significantly. The study provides evidence that indeed supply relationship management as a strategic alliance influences performance in these organizations. In addition, the study is of benefit to the government of Kenya who should create awareness of their policies through training of the key stakeholders for this organizations since the majority of the respondents 53.17% indicated that the government policies and strategies are ineffective. Supply relationship management had significant effect on organization performance and this requires that to improve on quality production and lead time, manufacturing firms must also improve their supply relationship management. Since the quality of the products has not significantly improved for the last 5 years, more strategies must be put in place to incorporate technology which will aid to improve the quality and also maintain required lead time in these organizations. Other researches and scholars may want to build on this study and explore other areas of interest that were not covered in this work

**Keywords:** *supplier relationship management, performance and manufacturing firms.*

## **Sustainable Entrepreneurship Factors Influencing Performance of Clearing and Forwarding Firms in Kenya**

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### **Abstract**

Businesses play a major role in developing sustainable world through innovation and creativity. However, sustainable development is a challenging task that can be attained through sustainable entrepreneurship development as conceptualized in Sustainable Development Goal 2015. Sustainable entrepreneurship is used to solve problems related to social and environmental sustainability by creating business opportunities through sustainability innovations. Clearing and forwarding sector in Kenya, consist of large and small (SMEs) firms with large firms having 30% of the market share and small firms occupying 70%. There are at least 826 clearing and forwarding firms in Kenya contribute to 5-10% of the country GDP. Out of this firms, 521 operates within Nairobi Metropolitan and serves approximately more than 25 million tons of goods through logistic practices in every year. Based on the statistics, small clearing and forwarding firms serves the largest segment of sector, this shows that lack of sustainable entrepreneurship in the sector may result to dwindling of the economy and low employment opportunities. The study aimed to investigate Sustainable entrepreneurship factors influencing performance of clearing and forwarding firms in Kenya. The study focused on social-cultural entrepreneurship, environmental entrepreneurship, entrepreneurial managerial support and innovative information on performance of clearing and forwarding firms in Kenya. Descriptive design was employed. The study targeted 1128 management and stratified sampling technique to come up with as sample size of 375. Primary data was collected using the questionnaire. Quantitative data was coded in the SPSS. The study revealed that there was significant positive correlation between social-cultural, Environmental entrepreneurship, and innovative information on performance of clearing and forwarding firms in Kenya. The study concludes that entrepreneurial managerial support has no significant influence on performance of C&F firms in Kenya. Organization Culture has a moderating effect in the relationship between sustainable entrepreneurship and performance of C&F firms.

**Keynote:** Performance, Social-Cultural, entrepreneurship, Environmental Entrepreneurship, Entrepreneurial Managerial Support, Innovative information, Organization Culture.

## **Effects Covid-19 on Supply Chain and Health care Product Innovations**

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### **Abstract**

The onset of covid-19 in late 2019 created turbulent and disruption of the social, economic and political systems. Worse still, business operation took a hard hit globally. Consequently, the global supply chain was thrown into total disarray, leading to shortages and stockout of raw materials, spare parts -components, unfulfilled products and service deliveries. worse still, the weak global health service delivery systems were exposed as the corona virus disease broke out in China, spreading across the world. The global pandemic overran the health systems leading to collapse of service delivery in terms of testing, treatment and general management of other ailments as patients shied away from health facilities for fear of contracting the virus. To mitigate the shortages of pharmaceuticals and non-pharmaceuticals products, many countries started re-tooling their production systems so as to produce PPEs and other protective gears, sanitizers, disinfectants, testing kits, oxygen concentrators, oxygen gauges, ventilators and so forth, In order to meet the growing demand of products that were in short supply. Ultimately, a lot of innovations started emerging across the globe, Kenya being no exception. Nonetheless, the speed of commercialization became a great challenge. Using an exploratory survey design, this study sought to examine the extent of commercialization of Covid -19 health care related products in Kenya. The study findings indicate that in as much as there were emerging innovative products, the pace of commercialization was still very low. It is recommended that the government should formulate policies that would fast track innovations patenting processes and ultimately, create regulatory frameworks that support commercialization of the same.

**Key words:** Covid-19, supply chain, health care service

## **Effect of Cash Accounting Practice on Performance of Commercial Banks in Kenya**

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### **Abstract**

The purpose of the study was to analyze the effect of cash accounting practice on performance of commercial banks in Kenya. The study was based on Portfolio theory of Cash Management, Cash Management theory, Transaction Cost theory, Free Cash Flow theory and pecking order theory. The study used mixed research design which involves collecting and analyzing both qualitative and quantitative data. The target population of the study comprised of the 6913 employees in management and supervisory cadres in commercial banks in Kenya. Stratified sampling technique was used. Data collection instruments were both structured and unstructured questionnaires. The data was analyzed using Statistical Program for Social Sciences (SPSS) windows version 21. Multiple linear regression analysis was carried out to analyze the effect of cash accounting practice on performance of commercial banks in Kenya. Pilot test was carried out for validity and reliability of research instruments. Regression analysis was carried out to test the significant levels of one variable to the other in the study. ANOVA was carried out to test the hypotheses of the study. The study is significant to the banking sector and the government of Kenya in formulation of different financial decisions and in policy making. The results of the study indicate that cash accounting practice has a significant positive effect on performance of Commercial banks Kenya. The findings reveal that commercial banks in Kenya carry out cash accounting practice. Cash accounting practice was found to be positively related to performance of commercial banks in Kenya. The study recommends that commercial banks in Kenya should a carry out cash accounting practice to evaluate cash performance in these commercial banks. The firms should have plans for their cash needs and requirements during a projected period, particularly one year and above to enable them achieve their set goals in advance and reduce the cost of capital and increase the returns of excess cash. They should also make sure that the banks' cash funds are in the optimal utilization and there are no extra borrowings. They should also maintain the minimum liquidity requirement as stated by the Central Bank of Kenya as both illiquidity and excess liquidity are financial diseases that can easily erode the profit base of a bank as they affect banks' attempt to attain high profitability level.

**Key Words:** Cash Accounting, Performance



## **Investments in Technological Innovation and Financial Performance of Small Scale-Tea Industries in Kenya**

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### **Abstract**

The agricultural sector in Kenya has been facing the challenge of increased cost of operations as a result of outdated technology. In an attempt to reduce its operation, cost tea sector has invested heavily in technology. Thus the purpose of this study was to establish the effect of technological innovation investment on financial performance of small-scale tea industry in Kenya. The study variables were investments on fermentation innovations, pruning innovations, weighing innovations and information systems innovations on the financial performance of small-scale tea firms in Kenya. This study was anchored on four theories, namely Schumpeterian Theory on Innovations, Efficiency Theory, Technology Acceptance Model and Theory of Innovation Diffusion. The targeted population was 66 small scale tea factories in Kenya. Secondary data for a period of 5yrs (2014-2018) was used for analysis using a panel regression model. Person Correlation results indicated that investment on fermentation technological innovation, investment on pruning technological innovation, investment on weighing technological innovation and investment on information systems technological innovation are positively and significantly associated with financial performance of small-scale tea industries. Before introducing technological innovations in the tea sector, cost of tea production in Kenya was high compared to other producing countries that earlier incorporated tea production technological innovations in the tea sector. In 2013 the cost of tea production in Kenya was USD 1.33 per kg, while in Vietnam it was USD 0.81 per kg. In India, the cost of tea production was USD 0.96 per kg, while in China it was USD 0.72 per kg. In Kenya, technological innovations in the tea sector were introduced in the year 2015. However, it is not empirically clear if technological innovations in the tea sector brought more benefits in terms of increased tea production or costs surpassed the benefits. Panel results revealed that there was a positive and significant relationship between investment on fermentation technological innovation and financial performance of small-scale tea industry in Kenya, positive and significant relationship between investment on pruning technological innovations and financial performance of small-scale tea industry, positive and significant relationship between investment on weighing technological innovations and financial performance of small-scale tea industry and positive and significant relationship between investment on information systems technological innovations and financial performance of small-scale tea industry in. It was also revealed that firm size is a significant moderator on the relationship between technological innovation investment and financial performance of small-scale tea firms was satisfactory. The study concluded that investment on fermentation technological innovation, investment on pruning technological innovation, investment on weighing technological innovation and investment on information systems technological innovation positively affects financial performance of small-scale tea firms. The study recommends that management can consider acquiring more continuous fermentation units as to allow efficient fermentation of tea while preserving quality. The study recommends that management of tea firms can consider investing on pruning machines to fasten tea pruning so as to give the plant a low, wide framework of branches that will produce many leaves each year. Pruning is essential to direct the tea plant's energy into leaf production. Tea firms can consider acquiring electronic weighing machines that are accurate and efficient. Modern machinery which can handle big volumes of input can be cost effective. Tea processing firms may consider investing on data information processing systems to aid in the generation, storage and relaying of data on tea prices, quantity and costs

**Key words:** tea sector, technological innovation, investments



## **The Relationship Between Green Bonds, Interest Rate and Financial Performance of Banks and Investment Firms Listed in The Nairobi Securities Exchange In Kenya**

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### **Abstract**

Infrastructural preparedness is a factor of social and economic progress both at the county and national level, as well as a driver of resilience and competitiveness. If economies want to advance towards a green economy and environmentally friendly and prosperous society, it is important for them to promote eco-innovation as one of the drivers of adaptation to current global challenges. In Kenya, the Green Bond market has seen exponential growth over the recent years. However, to date there has been limited research carried out on green bonds and their effect on financial performance of banks and investment firm's listed in the Nairobi Securities Exchange (NSE). Understanding the effect of green bond on financial performance is important for the growth of banks and investment firms listed in the Nairobi Securities Exchange. Previous studies have demonstrated that different forms of financing influence the financial performance of listed firms in an organized financial market. This study will investigate the relationship between green bonds and the financial performance of banks and investment firm's listed in the NSE with a major focus on the mediating role of interest rate in this relationship. Since interest rate is a strong determinant in the cost of debt, its effects is of a great concern in the measurement of financial performance. The independent variables will include included four major components of green bonds namely; Green Revenue Bonds (GRB), Green Project Bonds (GPB), Securitized Bonds (SB) and Proceed Bonds (PB) as per the green bond principles GBP (2016) while the dependent variable will be the financial performance of banks and investment firms listed in the Nairobi Securities Exchange, measured by two key performance indicators (KPI) namely return on equity (ROE) and return on assets (ROA). The general objective of this study will be to investigate the effect of green bonds on financial performance of banks and investment firm's listed in the NSE. The specific objectives of this study will be; to investigate the effect of green revenue bonds, green project bonds, and securitized bonds and proceed bonds on the financial performance of investment firms listed in the NSE. Lastly, the final objective will evaluate the mediating role of interest rates in the relationship between green bonds and financial performance of banks and investment firm's listed in the NSE. The study will adopted an ex-post facto research design with a sample size of 8 years from 2012 to 2019 since the first green bond was issued in Kenya. The study will employ both primary and secondary data, which will be collected from the National Treasury and the specific companies audited financial reports. Panel data model was adopted to investigate the effect of green bonds on the financial performance of banks and investment firms in the Nairobi Securities Exchange. Additionally, Baron and Kenny (1986) model will be employed to determine whether interest rate mediates in the relationship between green bonds and the financial performance of investment firm's listed in the NSE. The results of this study will benefit the Capital Market Authority (CMA) and the government in making appropriate policies that encourage green bond financing to improve the performance of investment firms listed in the NSE. This study is also aimed at benefiting academicians interested in studying green bonds and financial performance of firm's listed in the NSE in the banking and investment sector

**Key words:** financial institutions, rates

**Determinants of Financial Performance of Micro Finance Institutions In Kenya**  
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**Abstract**

The study evaluated whether capital adequacy influences financial performance of micro finance institutions in Kenya guided by the specific objective: to establish how capital adequacy influences financial performance of micro finance institutions in Kenya. Both qualitative and quantitative research designs were employed. The total population composed of 6028 employees in the registered Deposit Taking Micro Finance Institutions (DTMFI) in Kenya and 3914 workers in 7 sampled micro finance institutions. By way of proportional stratification random sampling, a sample of 7(DTMFI) was selected. Stratification was based on 2 distinct MFI strata: first registration with the Central bank Kenya secondly primarily deposit taking. Using purposive sampling a sample of respondents was picked from credit managers for validation of the self-reported responses from participants. We used a Likert-type questionnaire with 1-5 itemised schedule to gather primary data. In contrast secondary data was extracted from the 2016 and 2020 MFI financial statements published by the Central bank of Kenya. The study used Pearson product- moment correlation, linear regression, ANOVA and F-test to analyse and test quantitative data. The Linear regression model generated a beta of -0.085 therefore revealing a negative significant relationship between MFIs financial performance and capital adequacy. It was recommended that MFIs align their operations to the market principles in pricing their products to remain competitive. Additionally risk mitigation measures should be diversified by lending securitized loans and varying repayment packages.

**Key words:** Micro finance institutions; capital adequacy; financial performance, total risk weighted asset ratio.

## The Effect of Financial Leverage on Distress in Savings and Credit Cooperative Organizations in Kenya

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### Abstract

Financial distress is disruptive and costly, and especially relevant due to the impact on workers, shareholders, customers, suppliers, communities, and the financial entities. Extreme financial distress often leads to bankruptcy; part of the creative self-destruction phenomena that contribute to the dynamics of innovation and economic renewal. The aim of this study was to establish the effect of financial leverage on distress in savings and credit cooperative organizations in Kenya. Despite the increased supervision of SACCOs in Kenya through various mechanisms such as introduction of SASRA a significant number of SACCOs still face financial distress which has led to the winding up of these SACCOs this study therefore establish the current financial management strategies used in mitigating financial distress to predict future performance. A descriptive survey research design was used to establish the determinants of financial distress. The target population included 30 deposit taking SACCOs. Secondary data was obtained from Sacco's records published by SASRA. Data collected was analyzed using STATA computer software. The study established that financial leverage had insignificant relationship with probability of financial distress of the DT SACCOs implying that financial leverage did not determine financial distress of the DT SACCOs in Kenya ( $r=-.0956368$ ,  $p=0.476>0.05$ ). Although the study did not find any significant relationship between financial leverage and distress, any financial institution, SACCOs included should develop strategies of leveraging its finances, that is, increasing the rate of cash conversion cycle. This is because the SACCOs profitability is generated from this cycle.

### Key Words

Financial Leverage, Financial Distress, Cash conversion Cycle, Financial Investment.

**Influence of Trade credit on the Growth of Small and Medium Size Manufacturing Enterprises in Rwanda**

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**Abstract**

The purpose of this study was to analyze the influence of trade credit on the growth of manufacturing SMEs in Rwanda. To achieve the objective, the study used a mixed research approach involving both qualitative and quantitative methods. The target population of this study consisted of all the 868 small and medium manufacturing enterprises registered with Rwanda Development Board from which a sample of 273 firms was taken by way of stratified random sampling technique. Close-ended questionnaires were used in data collection. The data collected was analyzed using Statistical Package for Social Science 22 to generate descriptive statistics including percentages, frequency tables and mean scores. Multiple regression analysis was used to explore the relationship between Trade credit finance structure and the growth of small and medium size manufacturing enterprises in Rwanda.  $R^2$  was deployed to measure the extent of the goodness fit of the regression model. The findings from the study show beta values of ( $\beta=0.082$ ,  $p=0.047$ ) for trade credit finance. Hence, trade credit influences the growth of small and medium manufacturing enterprise in Rwanda. Among recommendations, the management of the SMEs should learn how to use account receivables and account payable to fully take advantage of trade credit finance. This will ensure SMEs continue producing or manufacturing during time of low liquidity and financial constraints.

**Key words:** Trade credit; Small and Medium Size Manufacturing Enterprises; Rwanda

**Influence of Budget Planning on Implementation of Water Construction Projects in Bomet County, Kenya**

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**Abstract**

Water projects all over the world have been initiated for the purpose of solving water problems. For many years in Kenya, various Government Agencies, Non-Governmental Organisations (NGOs) and donors have been investing large sum of money in water projects like building dams, boreholes, and wells. However, fewer projects are being completed within the budget or meeting original goals, owing to the fact that project stalled and collapsed. Therefore, there is still under provision of water for domestic use particularly in the rural and slum areas of Kenya. Budget planning is necessary for project success. Many studies have been carried out on the influence of budget planning on projects implementation, but the main focus has been on project management practices and project performance. The study sought to fill this knowledge gap. The main objective of this study was to analyze the influence of budget planning on implementation of water construction projects. Cash management theory guided this study. The study used descriptive survey design and therefore, water projects in the county of Bomet were the unit of analysis. Data was collected by use of self-administered Questionnaires. The study targeted 440 respondents and the sample size were 131 respondents drawn from all targeted unit of analysis. This study carried out a census on 88 initiated water projects in the county of Bomet. Pre-test study was administered to 18 respondents of Kajiado County to test the reliability and viability of the instruments. Data was collected through administration of a questionnaire. Regression results showed that all budget planning, was significant on implementation of water project with the F statistics value of 49.64, and P-value of 0.000. The coefficient determination of explanatory variable explains 52.7% of the variations. Technology integration (moderating variable) was found to have an influence on the relationship between planning and implementation of water projects. In conclusion, therefore budget planning influenced implementation of water projects. The study recommends that water trust funds and other institutions funding water projects can replicate the findings of this study to improve on accessibility to safe and clean drinking water to the citizens.

**Key words:** Budget planning, Implementation, water projects

**Determinants Of Financial Performance Of Micro Finance Institutions In Kenya**  
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**Abstract**

The study evaluated whether capital adequacy influences financial performance of micro finance institutions in Kenya guided by the specific objective: to establish how capital adequacy influences financial performance of micro finance institutions in Kenya. Both qualitative and quantitative research designs were employed. The total population composed of 6028 employees in the registered Deposit Taking Micro Finance Institutions (DTMFI) in Kenya and 3914 workers in 7 sampled micro finance institutions. By way of proportional stratification random sampling, a sample of 7(DTMFI) was selected. Stratification was based on 2 distinct MFI strata: first registration with the Central bank Kenya secondly primarily deposit taking. Using purposive sampling a sample of respondents was picked from credit managers for validation of the self-reported responses from participants. We used a Likert-type questionnaire with 1-5 itemised schedule to gather primary data. In contrast secondary data was extracted from the 2016 and 2020 MFI financial statements published by the Central bank of Kenya. The study used Pearson product- moment correlation, linear regression, ANOVA and F-test to analyse and test quantitative data. The Linear regression model generated a beta of -0.085 therefore revealing a negative significant relationship between MFIs financial performance and capital adequacy. It was recommended that MFIs align their operations to the market principles in pricing their products to remain competitive. Additionally, risk mitigation measures should be diversified by lending securitized loans and varying repayment packages.

**Key words:** Micro finance institutions; capital adequacy; financial performance, total risk weighted asset ratio.

## **Effect of Current Assets Management on Financial Performance of Non-Financial Firms Listed at Nairobi Securities Exchange**

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### **Abstract**

Financial performance in an organization is essential because firm's nonperformance can spell out failure. The underlying problem is that non-financial firms both globally and locally in Kenya are experiencing fluctuating financial performance and this affects the financial health of economic systems with grave socio-economic implications. This study is therefore motivated by the lack of clarity on how current asset management influences performance of non-financial firms. Ideally, efficient management of current assets should enhance financial performance yet in practice the connection between asset management and performance is not clear owing to theoretical, empirical and conceptual literature confounding contradictions. The specific objective of this study was to determine the effect of inventory management on financial performance of non-financial firms listed in the NSE. Alongside with that, the effect of the moderating variable (firm size) was also investigated. The study applied transaction cost economics theory. The methodology of the study was based on panel regression model. The study adopted descriptive research design. Target population included 42 non-financial firms listed in the NSE, for the period 2004– 2018. Secondary data from the annual audited financial statements published in the websites of respective firms was used. Hausman Test was used to test the hypothesis at p-value of 0.05, the null hypothesis that inventory management has no effect of financial performance was rejected. The same conclusion was arrived at for the moderating effect of firm size on how inventory influences financial performance. Based on these finding, the study concludes that inventory management has a positive effect on the financial performance of non-financial firms listed in the NSE. It is recommended that public firms enhance their current asset management strategies to boost performance.

**Key words:** Current asset management, financial performance, firm size, Non-financial firms listed in NSE

**Transforming From Microfinance Institution To Microfinance Bank In Kenya? Manage Institutional Change Well**

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**Abstract**

To provide a legal framework for transformation of Microfinance Institutions (MFIs) in Kenya into Microfinance banks, the Microfinance Act was enacted in 2006 and amended 2013. Even though the transformation was intended to stimulate growth in the microfinance sector, only three MFIs had successfully transformed by 2010. Evidence from other countries points out management of institutional change as a major factor affecting the transformation of MFIs, the available information is not conclusive on the specific aspects of management of institutional change that affect transformation and the extent of the effect. Thus, this study sought to establish the effect of management of institutional change in the transformation of Microfinance institutions into Microfinance banks in Kenya. The objectives of this study were to establish the extent to which management of institutional change affects the transformation of microfinance institutions into Microfinance banks in Kenya and to make recommendations for successful transformation. The target population was the 48 institutional members of the Association of Microfinance Institutions (AMFI) of Kenya. The study selected 100 respondents using simple random sampling from a purposive sample of 25 MFIs. Data was first explored for the underlying factor structure through factor analysis before being subjected to descriptive and inferential statistical analysis. The results showed a significant association between management of institutional change and successful transformation of MFIs into Microfinance banks in Kenya. The study concluded that management of institutional change was a significant factor in the transformation of microfinance institutions. The study recommends that transforming MFIs should prepare well so as to successfully manage institutional change. It recommends further research to determine the impact of MFI transformation on overall financial inclusion in Kenya.

**Key Words:** Institutional change, Microfinance, Microfinance bank, Microfinance institution, Transformation.



## **Covid 19 As A Driver in Behavioural Capital Investment**

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### **Abstract**

Outbreak of covid-19 has impacted the traditional work life resulting to a new working normal across the globe. This has created numerous human resource management challenges prompting organizations to invest in behavioral capital as mitigating strategy to reduce face to face work related activities so as to minimize the spread of covid-19 among the staffs. Using an exploratory study design the researchers investigated the challenges and opportunities inherent in human capital behavior. The study found that setting clear guideline on working from home, developing positive routines and holding themselves accountable and building social interactions resulted in combating anxiety, stress, burnouts and building evidence based mental health programs. The study recommends that the human resource department should make deliberate, consistent and real time communication to care for staff wellness and safety initiatives. In addition there is need for the organizations to monitor changes and updates on new employment legislation that impacts employee benefits.

**Key Terms:** Covid-19 and Behavioral Capital Investment

## **Thematic Area 10: Human Resource Management**

### **INFLUENCE OF ORGANIZATIONAL CULTURE ON EMPLOYEE OUTCOMES: THE MODERATING EFFECT OF HUMAN RESOURCE MANAGEMENT ORIENTATIONS IN KENYAS' CIVIL SERVICE**

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#### **Abstract**

Numerous empirical studies on organizational culture and employee outcomes have been undertaken mainly in the private sector and in the developed countries. Nonetheless, it is important to understand this relationship in the public service of a developing economy as well. Additionally, the effect of human resource management orientations on this relationship has not been explored, despite theoretical assertions that organizational culture and human resource management orientations can influence employee outcomes. This study was inspired by the desire to fill these gaps in the knowledge of empirical research. The study examined the effect of organizational culture on employee outcomes in Kenya's civil service and the moderating effect of human resource management orientations on this relationship. The study adopted a cross-sectional descriptive survey design method. Data was collected from employees in senior, technical and middle level cadres in Ministries and state departments using a self-administered questionnaire. The results of the study indicated that organizational culture significantly influenced employee outcomes in the civil service. The study results affirm findings from previous research which established a significant link between organizational culture and employee outcomes. The study recommended that top policy makers in the civil service should realign the policies and practices in the service to the prevailing organizational culture. This will enhance employee job satisfaction and commitment to organizations.

**Key words:** Organizational Culture; Human Resource Management Orientations; Employee Outcomes; Kenyans' Civil Service

## **Influence of Human Factors On Revenue Maximization in Devolved Units in Kenya**

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### **Abstract**

Revenue maximization has been a challenge to the decentralized units since the introduction of the devolved governments in Kenya. The evaluation of the Human Factors on revenue maximization for county governments in Kenya culminated in the design of an effective revenue mobilization strategy informed by the study findings. This paper aimed at establishing how local revenue should finance development projects such as feeder roads, collection of garbage, establishment and maintenance of the sewerage and sanitation system, cleaning the streets, development of rural and urban centres as well as constructing access roads through the effort of Employees working in the County governments and how they need to put in place mechanisms that will allow them collect revenue through taxation to fund their budget and ensure there is a balance between county budgetary allocation and revenue collection. Following the setup of the devolved governments, the county offices are expected to put in place efficient and effective revenue collection mechanisms to moderate between the revenue allocated by the central government and their budget deficit. The research adopted Matrix methods and a descriptive survey method, specifically the cross-sectional survey. The sample frame was extracted from the 47 counties in Kenya. The study concludes that there is need for attraction, recruitment and retention of skilled and competitive employees to increase revenue collection performance and recommends that the personnel involved in the revenue collection should be people of high integrity to ensure that the county government funds are not diverted but instead channelled to the county government account as required by law

**Key Words:** *Human factors, maximization of revenue, devolved units, Kenya*

**Investigating The Effectiveness of Recruitment and Selection Methods in Contemporary Public Sector Organizations: A Case of Narok Level Four County Hospital**

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**Abstract**

In the current dynamic and unpredictable operating business environment, organizations require human resources that is flexible, faithful, competent, reliable and self-assured, which provides an underpinning for achievement of objectives. Effective recruitment and selection can result in cost reduction for the process, high employee retention rates, employee loyalty and productivity and avoidance of legal issues. Narok county government, has a recruitment and selection policy however, it is not clear if it is effective enough since issues of responsiveness to emerging challenges are perceived. The main objective of this study is to investigate the effectiveness of recruitment and selection practices in public sector organizations with a focus on the Narok Level Four County Hospital. There is little empirical research that validates the efficacy of recruitment and selection methods in organizations. The research method adopted for this study was quantitative using a survey approach. Data on which the paper is based was collected from 87 employees obtained through simple random through a self-administered questionnaire. The researcher applied statistical tools of percentage analysis, regression and correlation for data analysis. The results indicated that advertising of job vacancies and use of internet are mostly the mode for recruiting potential employees. While most of the respondents strongly agreed that, internal recruitment method enhances motivation and reduces the labor turnover rates within the hospital.

**Key Words:** Recruitment, Selection, Effectiveness, Methods, Public Sector Organizations

## Relationship Between Career Management Strategies and Employee Performance In State Corporations In Kenya

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### Abstract

This study sought to find out the influence of career management strategies on employee performance in state corporations in Kenya, relevant theories and empirical data. The study was guided by the following specific objectives: to assess the relationship between succession planning and employee performance in state corporations in Kenya; to identify the relationship between career training and employee performance in state corporations in Kenya. The research designs that were used were cross-sectional survey and explanatory survey design. The study targeted employees of state corporations in the 14 Kenyan ministries. The study sampled 55 state corporations in Kenya. The state corporations were the unit of analysis while the head of departments of the state corporations were the unit of observation. The sample size for the study was 385 respondents. The study collected both primary and secondary data. Sources of primary data were questionnaires. Descriptive and inferential statistics collected were used to analyze the quantitative data collected. This study made use of multiple regression analysis. Analysis of qualitative data was thematic and it was presented in prose form. Presentation of the findings was done using chart, figures and table. The study found that succession planning positively and significantly influences employee performance in state corporations in Kenya; career training positively and significantly influences employee performance in state corporations in Kenya. The study recommends organization to first ensure that its employees are aware of policies of managing career development and that there is sufficient communication from supervisors on ways employees could better their career. The study also recommends state corporations to match their staff members with their skills and the position that best suit them; this will help them attain both long and short term competitive advantage.

**Key words:** Career Management, Career management Strategies, Career mentoring, Career training Career, Employee Performance, Policies, State Corporation, Succession planning

## Workforce Diversity and Employee Performance In The Constitutional Commissions Of Kenya

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### Abstract

The study's objective was to establish the influence of workforce diversity on employee performance in Constitutional Commissions of Kenya (CCK). Specifically, the study sought to determine the influence of gender diversity and age diversity on employee performance in constitutional commissions of Kenya. The study was guided by social identification and categorization theory, similarity/attraction theory. The study adopted a descriptive cross-sectional survey. Targeted population was 15 Kenyan Constitution Commission. The population of the study was staff members in the headquarters of the organization which was a total of 623 employees at managerial level. The sample of 244 members was used in the study and they were selected using Stratified random sampling method. Questionnaire was selected as data collection tool where the researcher administered them to the entire sample selected. The study conducted pilot study to enable validation and pretesting. The data gathered was analysed using SPSS version 23. The study analysed the data using descriptive and inferential statistics. Descriptive statistics were used in analysing quantitative data and the findings presented in tables, figures and graphs and in prose form. The study found that gender diversity positively and significantly affects performance of staff members in Kenyan constitutional commissions; diverse age positively and significantly affect performance of staff members in Kenyan constitutional commissions. Therefore, when employing staff, it is important to ensure that they are diverse; this will encourage their improved performance. Equal promotion of employees is important because it motivates employees to be dedicated to their work. It is also important for the organization to provide favourable environment and working conditions for employees depending on their age. The organization should increase diversity and use work groups to maximally utilizing their great participation and synergy in order to boost employee and organizational performance. The organization should ensure that there is education diversity among its employees, both management employees and juniors.

**Key words;** Age Diversity, Diversity, Employee Performance, Gender Diversity

## **The Effects of Training and Development On Employee Performance in 21<sup>st</sup> Century**

### **Organisations: A Case Study of The Narok County Government**

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#### **Abstract**

Training and development has become a crucial ingredient in the success of contemporary organizations. It helps in development of new skills, improvement of existing skills in core areas of the organization, increased adaptability to change, efficiency and effectiveness in production. To do this, organizations need to utilize human resources to their full potential. As organizations face pressure to stay afloat in the competitive business environment, emphasis must be laid on human resource preparedness to respond to the global challenges that are dynamic and unpredictable. The Narok county government runs training and development programs yet like other county governments it is often riddled with poor employee performance reflected in such indicators as poor customer service and negative feedback. This therefore, research evaluates the effects of training and development on employee performance in 21<sup>st</sup> century organizations. This study adopted a quantitative research design. A simple stratified sampling of 100 staff members was adopted using structured questionnaires that were self-administered. Data was collected from 50 employees constituting 50% of the targeted population. The data analysis method used was the descriptive statistics such as frequencies while for inference the study mainly used regression analysis. The findings of the study were that majority (92%) of the employees of the Narok county government had an improvement in performance as a result of training and development programs.

**Keywords:** Training, Development, Efficiency, Effectiveness, Human resources, Performance.

## Thematic Area 11: Strategic Management and Project Planning

### Influence Of Project Monitoring And Evaluation Practice On Performance Of Construction Projects In Kenya

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#### Abstract

The specific objective of the study was to examine the influence of project monitoring and evaluation practice on performance of construction projects in Kenya. The study used project management theory. The mixed research design was descriptive survey and correlation. The target population was 1761 which included 765 modern stalls managers, 9 managers of County modern markets, 62 managers of County polytechnics and 925 Early Childhood Development Education managers. The study applied stratified, random sampling and purposive. Sample size was calculated using Yamane (1967) formula and was 326. The study utilized primary data which was collected using self administered questionnaires that were in a form of a five likert scale ranging from 1(Strongly Disagree) to 5 (Strong Agree) with closed - ended questions. Reliability was tested using pilot study that was done using 32 respondents from Mumias East Sub County and the results obtained were Cronbach Alpha coefficient of 0.932. Validity was analyzed using a team of University experts in the field of project management. Data was analyzed using descriptive and inferential statistics. The correlation results showed that project monitoring and evaluation practice had a positive significant effect on performance of construction projects ( $r=0.147$ ,  $p=0.011$ ,  $R^2= 0.22$  implying 22%). Regression coefficient ( $B_4=0.180$  and Sig 0.11). The study concluded that there was a significant and positive influence of project monitoring and evaluation practice on performance of construction projects. The study recommended that managers in the construction projects should be trained and adopt monitoring and evaluation. Policy makers should train their members in monitoring and evaluation.

**Keywords:** Construction projects, project monitoring and evaluation practice, performance

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## **Influence of Competitive Intelligence on the Relationship between Strategy Formulation and Performance of Companies listed at Nairobi Securities Exchange, Kenya**

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### **Abstract**

The purpose of this study was to contribute to the extant knowledge on the relationship between strategy formulation and performance of companies. Specifically, it sought to investigate the moderating role of competitive intelligence on the relationship between strategy formulation and firm performance. The choice of this study was motivated by the recent performance of the publicly quoted companies in Kenya. The study was informed by the fact that they are representative of all sectors of the Kenyan economy and mirror the general performance of the economy. Further, listed companies have reported losses and performed below expectations including issuing profit warnings. Dismal performance has called for bailout for state corporations. The economy is facing challenges from global trends, covid-19 pandemic and increased cost of petroleum products. The study adopted cross-sectional survey research design. The target population was 264 senior managers of companies from finance, marketing, human resource and business development. Stratified sampling technique was used to ensure each sector was represented in research. A structured Likert based questionnaire on a five-point scale was used to collect primary data. Pilot testing was done on 19 respondents and reliability coefficient (r) was 0.789 which was within acceptable threshold. Out of 264 respondents, data was collected from 195 representing 73.8 response rate. Descriptive statistics and multiple regression were used to analyse and test the hypothesis. The results revealed that competitive intelligence moderates relationship between strategy formulation and firm performance. The paper recommends blending strategy formulation and business intelligence with digital market to tap economies of scale and potential opportunities at local and regional economies.

**Key Words:** *Strategy Formulation, Performance, Competitive Intelligence and Economies of scale*

**Does Performance Contracting Drive Citizen-Centric Service Delivery? The Case Of Huduma Centres' In Western, Kenya**

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**Abstract**

Public service delivery is a concept that has attracted a lot of interest in the discourse on performance management. The most Governments including Kenya has tried a raft of measures for a long time to improve on quality of services offered to its citizens, but not much change was witnessed. They used voluntary early retirement, freezing of employment, privatization, structural adjustment programme and retrenchment. Citizen-centric service delivery which assures that services reach individuals is however a concept that has not received due consideration under the public service delivery reforms. While, it is acknowledged that performance contracting has the potential to unlock competitiveness among public entities, no evidence exists to show how performance contracting impacts on citizen-centric service delivery in the context of the Huduma programme in Kenya. This study analyzes the effect of performance contracting on citizen-centric service delivery in Huduma centre's in Kenya. The study adopted the explanatory research design in line with the post-positivist research philosophy. A sample of 276 employees' is drawn from Huduma centre's in the western region of Kenya. Data collected with questionnaire and analyzed using multiple regressions. The key finding of the study is that performance contracting does indeed drive citizen-centric service delivery in Huduma centre's in Kenya. Specific findings indicate that performance planning and, monitoring and reporting are positive and significant determinants of citizen-centric service delivery, while target setting is not a significant determinant. The study concludes that, performance planning, monitoring and reporting, are important performance contracting phases in the pursuit of citizen-centric service delivery in Huduma centres in Kenya. Reforms in the Huduma programme should therefore seek to maximize mechanisms that provide for performance planning, monitoring and reporting

**Key words:** performance contracting, target setting, performance planning, performance monitoring and reporting, and citizen-centric service delivery

## Communication Planning and Implementation of Water Construction Projects in Bomet County, Kenya

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### Abstract

Globally over 40 million people are faced with deficiency supply of water and more than 110 million of the worlds' 240 million population have no access to clean and safe drinking water. The country like many other developing countries is facing formidable freshwater planning and management challenges. Despite the fact that large number of resources have been invested in water infrastructure, there has been minimal impact on implementation water infrastructures and water supply systems in most project areas. Communication planning is the key component to project success, but the main focus has been on project management practices and project performance. The main objective of this study was to assess the influence of communication planning on implementation of water construction projects in Bomet County, Kenya. Communication theory was used to guide this study. The study used descriptive survey design. Data was collected by use of self-administered Questionnaires. The study targeted 440 respondents and the sample size was 131 respondents. This study carried out a census on 88 initiated water projects in the county of Bomet. Pre-test study was administered to 18 respondents of Kajiado County to test the reliability and validity of the instruments. Data was collected through self-administered questionnaires. Regression results showed that communication planning, positively influenced implementation of water project with the F statistics value of 98.068, and P-value of 0.000. Regression resulted in  $R^2$  of 0.43. In conclusion, therefore communication planning influenced implementation of water projects. The study recommends that county government can embrace the use of technology to enhance communication among stakeholders of water projects. The study can be replicated in other counties so as to improve water services.

**Key words:** Communication, Planning, Implementation, Water Projects

## **Human Resource and Competitiveness of Large Manufacturing Companies in Kenya**

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### **Abstract**

Human resources remain integral in enhancing firm competitiveness and performance in the modern world. Owing to the importance of the manufacturing sector in Kenya, human resources would be a critical strategic management driver to incorporate in order to enhance their competitiveness. However, with little evidence on the relationship between human resources and competitiveness of the manufacturing firms in Kenya, the need for this study arose. The study also assessed the moderating effect of firm size on the relationship between human resources and competitiveness of the manufacturing firms. Resource based theory informed the study. Descriptive research design was adopted. A total of 454 large manufacturing firms were targeted and using a sampling formula, a sample size of 384 respondents was acquired. A structured questionnaire was used to collect the primary data which was analysed using both descriptive and inferential statistics. The study established that human resources through staff training, reward and motivation, the manufacturing firms recorded more performance. It was concluded that human resources had a significant influence on the competitiveness of large manufacturing firms in Kenya. The study recommended that that management of manufacturing firms ought to uphold employee training, rewarding and other human resources aspects as a way of enhancing the skills and productivity of the employees, towards enhancing competitiveness.

**Keywords:** Strategic Management Drivers, Human Resources, Large Manufacturing Firms, Firm Size, Firm competitiveness.

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## Thematic Area 12: Business Management

### Alignment of Organizational Structure as an antecedent to Performance

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#### Abstract

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The sugar industry in western Kenya has been the economic engine of the region, providing the source of livelihood to approximately 8 million people. The industry has experienced economic turmoil and is at the verge of total collapse. Numerous studies focusing on the external environment have been undertaken in an effort to revive the industry with little success. Not much has been done to address the internal environment as a determinant to performance. In a study carried out in the sugar industry in Western Kenya, the researcher sought to answer the question on performance by focusing on the effect of alignment of the organizational structure on performance. The study used both primary and secondary data. Data was collected from a study census of 50 managers and a sample of 395 farmers from the study population of 50 managers and 130,000 farmers. The method allowed for triangulation hence ensuring validity of the data. A survey research design with a mixed approach was used. A correlation coefficient model was applied in the data analysis to determine the strength and direction of the relationship between the variables while the coefficients of determination were used to show the level of change of values occasioned by the mediating variable. The resulting P-values were used to test for the reliability of the samples for the true values of the study population. The general findings of the study indicated that the mediating variable (strategic alignment) had a significant effect on the change in variation of values on the dependent variable occasioned by changes of values of the predictor variables. The study therefore concluded that the alignment of organizational structure of the sugar industry in western Kenya significantly determines the performance of the industry and recommended an alignment of the variables to the corporate strategy to enhance performance.

**Key words:** Strategy, Alignment, Management, Structure, Strategic fit

**Effects of COVID-19 Pandemic on Small & Middle-Income Economies (SMEs) in Developing Nations: A Case Study of Narok Town, Kenya**  
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**Abstract**

The COVID-19 pandemic caught many Small and Middle-Income Enterprises (SMEs) unaware and unplanned. The pandemic led to restriction of several economic activities in Kenya; key amongst them transportation, tourism and education. The ripple effect of these restrictions caught up with SMEs, taunted to be a growing economic pillar in Kenya. This study purposed to analyze the exact effect of the pandemic on SMEs in Narok region, Kenya using various economic metrics. The findings were geared to furnish policy makers with the exact economic situation resulting from COVID-19. A case study research design was used with the help of questionnaires, interviews and observations. The researchers found out that most of the entrepreneurs were actually youthful. Commencement of SMEs was largely dependent on the political environment. Most of the SMEs in the region had begun between 2016 to 2018. The number of employees per SME had been effectively reduced to an average of 2 with their daily wages reduced from Ksh. 800 to 200. The pandemic reduced the supply of SMEs stock from other regions into Narok. 82.86% of the SMEs were forced to obtain stock within the county itself. Both the supply of stock to SMEs and their corresponding demand by buyers were drastically reduced by 77.14% and 91.43% respectively. There was however no significant increment in the pricing of the products ( $P < 0.05$ ). The net profit margins of the SMEs reduced from in excess of Ksh. 20,000 to about Ksh. 5,000 per month. Other auxiliary services such as finance lenders, insurance and marketers were equally affected. About 54.45% of the SMEs were facing dissolution by their owners should the situation persist. In conclusion, the researchers found out that COVID-19 was more of an economic pandemic rather than a health pandemic in the study region. The authors recommend the national and county government to cushion the premises by waiving off some of their taxes.

**Keywords:** SMEs, COVID-19 pandemic, economic effects

## Role Of Interest Rate Regulation In Explaining Economic Growth In Kenya

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### Abstract

Kenya's economic growth rate has been inconsistent accompanied by a number of macro-policy measures. The slow or turbulent growth rate could be as a result of poor governance, imprudent macroeconomic policy measures, geographical location, amongst others. Often, the countries monetary policy has been used to influence the macroeconomic objective of minimum unemployment, economic growth and favorable inflation rate. To achieve these, the Central Bank of Kenya deploys a number of policy measures including reduction in base lending rate and alteration of required reserve ratios. These measures have however proven futile in influencing credit growth. The objective of the study was therefore to assess the effectiveness of interest rate regulatory policy on influencing credit growth and ultimately long run-economic growth and development. To achieve the study objective, Vector autoregression model, VAR was employed. The research was based on secondary information obtained from quarterly statistical releases; Kenya National Bureau of Statistics, World Bank and World Development indicators for the period April 2000 to March 2017; to cover the period prior to implementation of interest rate capping law, and from January 2018 to March 2019 to cover the post implementation duration. The results show that a positive shock in credit level results into a positive response in economic growth. Additionally, the results show that irrespective of sluggish response of credit growth to changes in lending rate, there is an indirect relationship between credit growth and lending rate. There is therefore need to consider other tools to influencing credit growth other interest rate.

**Key words:** economic growth, poor governance, policy measures, lending rate, required reserve ratios, credit growth, Vector autoregression model and interest rate capping

## **Effect of Green Manufacturing on Performance of Manufacturing Firms in Kenya**

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### **Abstract**

The main purpose of this article is to determine the effect of green manufacturing on performance of manufacturing firms in Kenya. This study was anchored on resource dependence theory. The study was based on positivist approach while employing explanatory research design. The study targeted 757 manufacturing firms in Kenya registered. Stratified and Simple random sampling was used to select a sample of 386 firms. Primary data was collected using questionnaire that was addressed to firms operational and procurement managers. Inferential statistics using regression and correlation analysis was applied to assist examining relationship between the research variable. The findings showed that green manufacturing had significant and positive effect on performance of manufacturing firms in Kenya. Therefore, it is utmost necessary for the firms to use inputs with relatively low environmental impacts.

**Key words:** Green manufacturing, Performance, Firms, Green Supply



## Influence of Turnaround Strategies On Organizational Performance of County Governments In Kenya

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### Abstract

This study sought to establish the influence of turnaround strategies on organizational performance of county governments in Kenya. It focused on technology advancement, capacity building, restructuring turnaround, collaboration and resource mobilization strategies. The specific objectives are to determine the influence of technology advancement strategy on organizational performance of county governments in Kenya. To investigate the influence of capacity building strategy on organizational performance of county governments in Kenya. The influence of restructuring strategy on organizational performance of county governments in Kenya. Examine the influence of collaboration strategy and organizational performance of county governments in Kenya. Establish the moderating influence of resource mobilization on the relationship between turnaround strategies and organizational performance of county governments in Kenya. This study was anchored on five theories:- diffusion innovation theory, learning organization theory, agency theory, contingency theory and resource-based view theory. These theories focus on strategies that facilitate turnaround and organizational performance. This investigation utilized positivism research theory. It embraced engaging and quantitative exploration plan. The study was conducted in 8 counties in Kenya. The target population was 282 respondents. The total sample size was 192 respondents. Primary data was collected using structured questionnaires, while data was generated using SPSS version 22. The study conducted various tests including normality test, multicollinearity, stationarity, heteroscedasticity and autocorrelation tests. Test of hypothesis was done at 95% confidence interval. This study conducted correlation and regression to weigh the influence of the independent on the dependent variables. The study found that technology advancement strategy significantly influences organizational performance of county governments in Kenya; capacity building strategy has positive significant influence on the organizational performance of county governments in Kenya; restructuring strategy positively influences organizational performance of county governments in Kenya; collaboration strategies positively influences organizational performance of county governments in Kenya and resource mobilization has significant influence on the relationship between turnaround strategies and organizational performance of county governments in Kenya. The study recommends county governments to embrace more advanced technology and use it in its daily work to enhance efficiency and productivity. The counties should provide career progression opportunities to its employees; this would improve employee satisfaction and therefore improve their performance which in turn results to overall organizational performance of the county government. Counties should embrace more use of restructuring strategy; this would form the basis to adoption of other turnaround strategies. County governments should ensure that they incorporate value creation competency and activities in the organization strategies. The study recommends the counties to embrace resource mobilization more since some counties were found to be ineffective in resource mobilization; this would start by first identifying the resources needed. This study recommends policy formulation on turnaround strategies and the procedures that should be followed when implementing these strategies.

**Key words:** turnaround strategies, organization performance, companies



### Thematic Area 13: Housing & Urban Planning

#### Policy Framework on mitigating building failures: A critical ingredient for safe, secure and resilient built environment in Kenya.

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#### Abstract

Vision 2030 envisages construction of 200,000 housing units annually while big 4 Agenda on affordable housing intends to construct 500,000 houses by 2022, to realize the demand for housing that stands at 250,000 annually against 50,000 constructed every year. The demand for housing is aggravated by the high population growth, urbanization rate and effects of devolution. This demand has made developers to construct sub-standard houses without following appropriate building policies, resulting in increased building failures, which is a global challenge that reduces resilience of built environments. It has become more prevalent in Kenya in the last decade, which was the motivation of this study, focusing on how policy framework can mitigate building failures in Kenya. Study population (877 target and sample size of 275 respondents) was drawn from institutions involved in Policy, formulation, planning and enforcement as well as regulatory professional bodies in the building sector. Primary data (quantitative and descriptive) was collected through structured questionnaires which was pilot-tested for reliability and validity. Regression analysis undertaken to identify the significance of study variable, while descriptive statistics such as frequencies, percentages, the mean, standard deviation and standard errors were used in describing the data. The study findings indicate high level of unawareness of the existing policies and that the policy coverage is inadequate particularly areas of safety and risk management. Part of stakeholders do not comply with the existing policies and are not conversant with the building sector polices. The study concludes that formulation of building policies should all be inclusive involving building stakeholders and harmonized to a comprehensive building policy with clear roles of National and County Governments including National institutions and professional bodies in management of building sector. The study suggests further research on the influence of policy framework on mitigating infrastructure failure that would stimulate the realisation of big four agenda on affordable housing.

**Keywords:** Keywords: Building failures, Policy Framework, Buildings collapse, Power Elite Theory

## **Challenges facing application of Public Private Partnerships in low cost urban housing in Kenya for a resilient housing sector**

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### **Abstract**

Many countries, Kenya included are signatories to many international conventions and treaties which call for the protection of the right to adequate and affordable housing to citizens. Despite these obligations, countries have faced challenges in providing housing, such that in Kenya, the demand for housing is estimated to stand at almost 2 million housing units. Annual demand for housing is 250,000 units against supply of 50,000, a situation which affects mostly the low income urban households, hence threatening their resilience to many shocks including COVID 19. To address the housing deficits, it has been proposed that Public Private Partnerships (PPPs) models be applied in the housing development, but the concept has faced many challenges. This paper used Delphi method of forecasting the challenges facing application of PPPs in low cost housing, after which it was found out that solutions for the identified. Three Delphi panels of housing developers (contractors); Housing financiers and Housing practitioners (officers in the State Department of Housing and Nairobi City County employees in Housing department) were utilized. It was found out that despite the law being in place, there exist challenges in the application of PPPs, which should be addressed to make the concept amenable to housing development. Recommendations made included the need to address the key challenges, review of PPP legal and regulatory frameworks to make them address unique low cost housing development characteristics, and thereby reduce the likely shocks and build the resilience of such households. It was concluded that PPPs are applicable in down market urban housing if the challenges identified are addressed.

**Keywords:** Public Private Partnerships; Public sector/government; Private sector/private parties; low cost urban housing; low income urban households.

## Thematic Area 14: Information Sciences

### Entrepreneurial Knowledge Diffusion Practice: The Role of Dissemination Networks in Innovation performance in Firms

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#### Abstract

Dissemination of information and knowledge in firms is very important for product development and other activities performed by various departments, functions and individuals. The lack of such important function affects the entrepreneurial knowledge diffusion, hence negatively affecting the innovation performance. Firms are expected to seriously evaluate their decisions of developing dissemination systems in line with the company's objectives and profile. This is what informed the undertaking of this study in pharmaceutical firms in Kenya. The study is motivated by an ongoing Ph.D. research in the area of entrepreneurship development in Kenya. The targeted population was 163 respondents in pharmaceutical industry in the city of Nairobi, Kenya. The study adopted both quantitative and qualitative techniques in data collection using questionnaires and interviews. The data was analyzed using SPSS software and the results were presented in the form of descriptive and inferential statistics. The results revealed that 62.2% (mean=3.11) indicated that information generated through pharmaceuticals is key to enhancing innovativeness of firms, 82.6% (mean=4.13) alluded that information analysis of drugs ensures production of quality drugs, 82.4% (mean=4.12) were of opinion that information storage provides mechanisms to enhancing continuous productivity. This is an indication that pharmaceutical firms require information analysis of drugs as a form of dissemination of knowledge for enhancing the innovation performance. This can be interpreted to mean that it is a very important area of research in the manufacturing sector. It supports drug formulations, degradation of products and biological samples containing drugs and their metabolites. Information analysis also tests drug stability of the specific drug substances of maintaining established standardized level of purity in specified times. Thus, the results demonstrate that information analysis of drugs is a key form of knowledge dissemination to the innovation performance.

**Key Words:** Entrepreneurial Knowledge, Diffusion, Practice, Dissemination Networks, Innovation performance, Firms

## **INFORMATION TECHNOLOGY AND PERFORMANCE OF AGENCY BANKING IN COMMERCIAL BANKS IN KENYA**

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### **Abstract**

Information Technology is the ability of a company to integrate information sharing mechanisms among the departments, employees and customers smoothly with little or no barriers and through use of the modern technology. The main aim of this paper is to establish the influence of information technology on the performance of agency banking among commercial banks in Kenya. The study also assesses the moderating effect of firm characteristics on the relationship between information technology and performance of agency banking. The study was informed by the Technology Acceptance Theory. A descriptive survey research design was adopted. The target population was the commercial banks with agency banking in Kenya. A total of 303 respondents was drawn from branch managers were surveyed. A structured questionnaire was used and the obtained data analysed using descriptive and inferential statistics, The findings revealed that information technology had a significant influence in agency banking performance in commercial banks in Kenya. Those banks that ensured appropriate ICT skills, availability of ICT infrastructure and upholding training on ICT recorded more deposits through agency banking. Firm characteristics was found to have a moderating effect on the relationship between information technology and the performance of agency banking in commercial banks. The study concluded that information technology was essential in steering the performance of agency banking.

**Keywords:** Strategic Drivers, Information Technology, Agency Banking, Firm Characteristics, Commercial Banks, Firm Performance

## Behavior Change Communication: The Role of Media in Kenya in the COVID-19 Era

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### Abstract

The Sustainable Development Goals (SDGs) as adopted by United Nations Member States is a blueprint for peace and prosperity for people and the planet. The SDGs are broken down and advanced in seventeen (17) broad Goals. The adoption and full implementation of these Goals is envisaged to lead to a realization of, among other achievements, a robust development of the economies of the Member States by the year 2030. Kenya, a Member State, developed the Vision 2030 blueprint to focus her operations in the achievement of the SDGs. This is further being realized through identified development priority areas - the Big Four Agenda- where, specifically, Universal Health Coverage and Food Security and Nutrition are the main drivers of the SDG Goal No. 3 which is to ensure healthy lives and promotion of well-being for all at all ages. However, despite this elaborate strategy, there still remains little to celebrate about as majority of the drivers and enablers of these aspirations have not taken up the task to help in the attainment of the same. Little is known of their engagement and involvement including the media industry which is significant. The 'new normal' brought about by the COVID-19 exposed the role of the media industry. The media in Kenya found itself grappling with how best to communicate health messages, including food and nutrition. Through various channels, the media played an integral role in bringing information to the masses in order to affect change. This is because COVID-19 required a complete change of behavior if populations are to survive the pandemic. The objective of the Study was to establish the place of Behavior Change Communication (BCC) and what systems the media built in responding to the pandemic. Adopting Content Analysis of both primary and secondary data from the mainstream media houses in Kenya and other relevant Government agencies, the Study found out that the media had a critical role to play in its duty of informing, educating and entertaining. Additionally, using the Agenda Setting Theory, the media had an even bigger responsibility of ensuring that the masses get the correct information and re-engineer their thinking to change attitudes towards the pandemic. The Study recommended that media houses should adapt to the changing dynamics in the communication industry as well as invest in human resource that is competent in development communication.

**Keywords:** Sustainable Development Goals, COVID-19, Behavior Change Communication, Agenda Setting Theory

## **Challenges and Opportunities for Academic Libraries during and Post COVID-19 Pandemic**

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### **Abstract**

COVID-19 pandemic has unprecedented effects on academic institutions, which led to their closure. In particular, academic libraries that provide critical support for teaching and research success were equally affected as physical libraries also closed as a measure towards overcoming the spread of the virus. Traditionally, libraries have provided physical learning space, print resources, and e-resources to a limited extent as prominent services to their users. However, with the new norm, libraries are challenged to provide their services by proactively embracing recent technological trends in electronic resources, information access, and dissemination and capacity building of both staff and students. Based on the preceding, the study undertakes a review of the literature to unearth critical best practices aimed at transforming libraries into playing their supportive role in academia during the global pandemic and beyond.

**Keywords:** Academic Institutions; Academic libraries; COVID-19 Pandemic; Library services; ICT in Libraries

## **Coping with Implications of Government Policy on COVID-19 Pandemic on Livelihoods among Kahawa Wendani's Low-Income Residents in Kiambu County**

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### **Abstract**

Low-income households are most vulnerable especially whenever the main source of income of the household head is affected. It could suggest a total change of activities and prioritization of things or a collapse of the basic structural framework within the household itself, since everything else depends on the income of the household head. However, the head of household often attempts a number of strategies to cushion the family from total collapse in such circumstances. This paper is based on a rapid assessment of the implications of the government's measures against COVID-19 pandemic on the livelihood activities of ten purposively selected self-employed low-income persons in Kahawa Wendani ward of Kiambu County. The paper mainly focuses on the curfew and partial lockdown measures as the residents of Kahawa Wendani ward were largely affected by the two. The paper is also linked to the social capital framework which is used to understand how the residents are able to cope using their trusted networks of friends and relatives. How this happens shows that the trusted social networks have provided support to the vulnerable members in times of catastrophic events but this can be strained and abused if the government measures persist and lead to further deterioration of overall household welfare.

**Key words:** Low-income, Household head, Vulnerability, Social capital, Coping, COVID-19, Self-employed, Curfew.



## Effect of Athlete Expertise On Brand Endorsement in Manufacturing Companies in Kenya

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### Abstract

Despite the widespread use of athletes as product or brand endorsers, there is a relative lack of published research that investigates the influence these athletes may have on a target market particularly in Kenya. The study has global implications as our athletes have been known world champions for along time. This study therefore looks at the effect of athlete expertise on product endorsement among manufacturing firms in Kenya. The study employs a cross sectional survey research design. The target population is comprised of all the marketing officers in the 625 manufacturing firms in Kenya. A sample of 166 respondents is drawn from the target population to participate in the study. Simple random sampling is used to select 166 firms to take part in the research. The study uses structured questionnaires that are distributed to the 166 marketing officers. The questionnaire was pilot tested before commencing data collection to help in removing errors and enhance clarity. The questionnaire was further tested for validity and reliability. Data collected was analyzed using Statistical Package for Social Sciences (SPSS) version 24. Analysis was done using both descriptive and inferential statistics. Descriptive statistics were used in the form of percentages, frequencies, standard deviation and mean scores. Pearson correlation coefficient was used to test for the relationship between variables. Multiple regression analysis was also used to fit the regression model and to test the study's hypothesis. Analysis of findings indicated that athlete expertise has a significant effect on brand endorsement in manufacturing firms in Kenya. The study therefore concluded that athlete expertise has a significant role in brand endorsement as a marketing strategy. It was therefore recommended that manufacturing firms be careful when selecting endorsers for products with an aim of maximizing the value of endorsement by having athletes with high expertise level.

**Keyword:** Athlete, Brand Endorsement, expertise, celebrity, marketing

## Thematic Area 15: Social Studies

### Inspiring Civil Servants Organizational Citizenship Behaviour Through Interpersonal Justice to Build Resilient Systems to Mitigate Global Challenges in Kenya

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#### Abstract

Global challenges facing countries today include climate change, political upheavals, slumping economies, and health pandemics. These have also impacted on organizations which face cash-flow, competition, revenue growth and service delivery challenges. To mitigate these challenges and achieve their buttomline, organizations need employees who are inspired to perform beyond the call of duty. This paper explored the influence of interpersonal justice on organizational citizenship behaviour of civil servants in Kenya. Justice, especially in the interpersonal treatment of employees can achieve increased employee morale, give employees a sense of being valued, and reduce their turnover intentions and put the organization on the path for productivity. Through justice, employees can be inspired into a performance culture that can lead organizations into productivity and build resilient system to respond to environment shocks, political upheavel, slumping economy and health pandemics. The ground for the paper is that the civil service in Kenyan faces a myriad of counterproductive work behaviours such as absenteeism, industrial actions, abuse of public property, lateness, and high turnover rates; behaviours which have resulted in poor service delivery and denied citizens quality services and a stagnated economic growth due to reduced percentage of available productive man-hours. This paper hypothesized that when employees percieve interpersonal fairness, they are likely to respond by displaying organizational citizenship behaviour, an outcome that make employees work above and beyond job descriptions, compromise difficulties and foster positive workplace climate. A cross-sectional research design was used to study all civil servants. A sample of three hundred and seventy-five employees was selected using simple random sampling to respond to a piload structured questionnaire. Data was analyzed using desriptive and inferential statistics. Results confirmed existence of positive and significant relationship and concluded that the variables were related and interpersonal justice should be used to inspire organizational citizenship behaviour of civil servants in Kenya to improve performance.

**Keywords** - Organizational justice, interpersonal justice, organizational citizenship Behaviour, Public Service, Kenya

## **Role of Stakeholder Participation in Electoral Process In Kenya**

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### **Abstract**

Global perspectives on electoral processes have seen various challenges related to Governance. This has also trickled down to both regional and local context in the manner in which elections and related challenges have manifested. Kenya strives in its Vision 2030 blueprint more so the political pillar envisages robust political institutionalized greater achievements towards the way Citizens benefit from good electoral practice. The general objective of the study was to establish the role of stakeholder participation in electoral process in Kenya. The study adopted descriptive survey design that targeted respondents from various selected institutions participating in electoral process. Questionnaires were used as research instruments to collect data. The study tested the null Hypothesis that media participation, Citizenry participation, election observer participation; civil society organization participation and moderating variable constitutional framework have no significant role in Electoral Process in Kenya. A pilot test was conducted to ensure validity and reliability of the data collection instrument. A sample of 199 respondents was fused to collect data. Data analysis was done using descriptive statistics and correlation analysis. The study conducted various tests including multi collinearity, autocorrelation tests, normality tests and heteroscedasticity tests. The study found out that there was a positive and significant relationship between media participation, citizenry participation, election observer's participation, civil society organizations participation, constitutional framework and electoral process. Constitutional framework had a positive and significant moderating role for Media participation, Citizenry participation, Election observer participation and Civil society participation in electoral process. The study concludes that media participation, citizenry participation, election observer's participation, civil society organization participation and constitutional framework have a positive and significant relationship in Electoral Process. The study recommends that policy makers should consider the various factors involved in a complex and dynamic situation before making decisions in Electoral Processes that will influence political stability of Kenya.

**Key words:** electoral process, constitution, citizens

**THE INTER-GENERATIONAL GLOBAL PEACE DIALOGUE KENYA REPORT HELD AT MAASAI MARA UNIVERSITY ON 12<sup>th</sup> October 2019, NAROK COUNTY**

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**Abstract**

With reference to REF: MP/19/Vol 1/001, done in accra | 20.08.2019:(special request for partnership to host the global peace intergenerational dialogue), Maasai Mara University in collaboration with Narok county government, Ewaso-nyiro South Development Authority, Narok office of the Kenya Rural roads Authority, Kamwaro and Co. Advocates initiated a global peace dialogue. The event brought together over 300 young upcoming professionals to dialogue with their leaders on a range of global issues that spanned the economy, climate action, health, education, employment and security.

The Kenya, intergenerational dialogue forms part of the collaborative efforts to create social compacts between government, multi-lateral agencies, the private sector and civil society towards creating an innovative solution to ongoing challenges to peace and development. IGD serves as a platform for young people to hold discussions with their countries leaders on the world and future they want and to reflect on how they want to be involved in shaping it

The outcome of the dialogues will serve as the representation of the voices of young people across the world which will be included in the global peace Charter. As part of the outcomes of Maasai Mara University is working toward establishing a global peace initiative chapter within the university to pursue peace related projects for Kenya. Global Peace is a global movement committed to finding innovative solutions to the challenges facing the world & working together to create lasting peace. It is an initiative of the African Centre for the Constructive Resolution of Disputes (ACCORD), a civil society organization working throughout Africa to bring creative African solutions to the challenges posed by conflict on the continent through conflict management, analysis and prevention. It intervenes in conflicts through mediation, negotiation, training and research. Since 1992, ACCORD has played an integral role in conflict resolution activities across Africa by building the capacity of Africa's leaders to resolve conflict and to address the underlying political barriers to growth and stability.

Peace is more than the absence of War... It is also the absence of Poverty, Unemployment and Inequality. Peace in itself does not suffice, in managing conflict there must also be development so as to ensure peace is sustainable. In addressing the triple challenges, Global Peace has identified 4 core area thematic, that serve as our guiding principles in the implementation of our activities: 1. Build co-operation, tolerance and shared values; 2. Build inclusive economic growth; 3. Preserve the environment; and 4. Share Knowledge for Human Progress. Global Peace aims to become a catalyst for these collaborative efforts – from the mitigation of conflict to addressing the root causes of conflict – Global Peace will convene, network, and build collaborative relationships for conflict prevention and sustainable peace. Global Peace is possible, it just requires a global commitment towards working together for a better world.

Global peace begins with individual peace. People often opt to look for peace than work for it. peace is its own reward, it is a result of retaining your mind to process life as it is rather than you think it should. There are two forms of peace: negative (cold war) which is the absence of wide ranging physical violence or the condition of war and positive peace (hot peace) promoting structural and cultural peace as it involves development of a society in which there is no structural violence or social injustice

The roles and contributions of Youth to peace cannot be undermined. Kenya's political history portrays them as energy behind political protest, intergroup clashes, and violent extremism. However consider Youth and the use art, music and drama in peace building, youth sports and peace building eg peace tournament, youth and dialogue and reconciliation, technology and youth empowerment. Specific findings and observations are: Young people recognize and do seize opportunity for peace building in the aftermath of violence, their contribution are financially under-resourced, but driven by volunteerism, signs of increasing female participation and gender sensitivity in youth led peace building. The overview of peace and security challenges in Kenya roll call in this report includes intercommunal violence, election violence, violence extremism, conflicts over land and violence involving state security agencies forming the basis of the IGD dialogue for analysing the underlying causes and drivers, the roles of youth there in impacts on young people and society and the challenges they pose to peace building.

A range of impacts relating to strengthening co-existence were identified, include the following: f Improvement in co-existence relationships , Local education policies with strategic lines relating to the theme of co-existence, Celebration of a social pact between youth gangs , Strengthened social capital f Consolidation of networks and alliances in different sectors To measure such impacts, however, still requires considerable further development of measurable indicators. The key questions are: how can we overcome interreligious and intercultural misunderstandings and misperceptions ? how can we participate in overcoming these tensions and conflicts ? How can we transform conflicts into opportunities of new collaborations ? Through dialogue we can learn to find similarities unnoticed before and even come to respect and sometimes appreciate differences. Through dialogue, we can come together as human beings to find inclusive solutions to challenges. Dialogue skills and competence enable people actively participate in decision making and resolution of communities issues for sustainable development.

Lastly, from the SDGs, "*Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels* How can a country develop-how can people eat and teach and learn and work and raise families—without peace? And how can a country have peace without justice, without human rights, without government based on the rule of law? Some parts of the world enjoy relative peace and justice, and may come to take it for granted. Other parts seem to be plagued by armed conflict, crime, torture and exploitation, all of which hinders their development. The goal of peace and justice is one for all countries to strive towards. The Sustainable Development Goals aim to reduce all forms of violence and propose that governments and communities find lasting solutions to conflict and insecurity."

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**Role of the Church in Curbing Drug Addiction Problems during the COVID 19 Pandemic in Kenya:  
A Case Study of Nairobi Chapel**

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*Abstract*

Drug and substance abuse is considered a worldwide menace. The prevalence of drug and substance abuse has been on an increasing trend with an estimation of 3.3% – 6% of the world total population aged 15-64 years abusing drugs and substances annually. Drugs and substances abuse is also a major social problem in Kenya. Half of drug abusers in Kenya are aged between 10-19 years with over 60% residing in urban areas and 21% in rural areas. The most commonly abused drugs in Kenya are alcohol, tobacco, bhang (marijuana), glue, miraa (khat) and psychotropic drugs. Kenya experiences the effects of drug and substance abuse especially during the ongoing Covid-19 Pandemic. The Church, being a tool that helps society live godly lives, should take part in the fight against drug and substance abuse. This study, therefore, sought to identify the role of the Church in curbing drug addiction problems. The study targeted 50 churches under the Nairobi Chapel umbrella of Churches. Questionnaires were employed to collect data from individuals in charge of drug addicts' recovery programs within Nairobi Chapel. Data was analyzed and presented using tables and charts. From the study, only 40% of the churches that took part in the study had ministries/departments to help in combating drug abuse, none of the churches had financial allocation for the same. In terms of Human Resource used in the fight against drug and substance abuse, only 6% of the churches had drug and substance rehabilitation pastors. On involvement in advocacy, only 20% of the churches were involved in advocacy, while 61% of the churches took part in partnerships with drug addiction and rehabilitation and prevention programs.

**Key words:** Church, drug abuse, addiction, rehabilitation and prevention

**The Role Of A Social Worker In The Prevention Of Jigger Infestation Among Children In Kisii County**

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**Abstract**

Social workers are key professionals in assessing social care need and providing psychosocial support. Nonetheless the needs in jigger infestation containment and control are not well managed. Tungiasis is both a social and public health concern worldwide. It affects the victim's quality of life through localization in the foot causing walking difficulties that reduce the normalcy of the infested child. Both social and psychological problems such as low self-esteem and stigma has been identified among the children infested with jiggers. The purpose of this study therefore was to investigate the role of a social worker in the prevention of jigger infestation among children in Kisii County. The study utilized descriptive survey design. The sample size was 50 pupils, 50 parents, 20 Key Informants and 20 practicing Social workers. The findings of the study reveal that in order to mitigate Tungiasis, the risk factors that contribute to their spread such as poverty, poor hygiene conditions, area sanitization, inadequate health facilities, sharing houses with domesticated animals, political negligence and controlled number of children in families should be addressed. social work practitioners should engage with children to assess challenges in social functioning, process information in ways that enhance their ability to maintain body hygiene, develop skills to curb tungiasis and create support for change. The study recommends a change of behaviour in the community and the superstitions perception on the causes of Tungiasis.

**Key Words:** Tungiasis, Social worker, Psychological problem, Stigma, Low self-esteem.



**The Response of the COVID- 19 Pandemic on the Indigenous communities: Case of Access to Emergency health care Among the Ogiek of Kenya**

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**Abstract**

Empirical evidence shows that ethnic minority populations experience worse outcomes than majority groups during and after disasters or emergencies. They often face a disproportionate burden of health emergencies and a lack of emergency medical services. The COVID-19 pandemic is having serious impact on the health, wellbeing, and livelihoods of people across the world, with a disproportionate negative effect on some people. The purpose of this study is to investigate how the Ogiek in Kenya conceptualize COVID 19 emergencies, and offer an analysis of how local notions of emergencies might inform the development of local emergency care management systems. This study will employ an ethno-historical design. It is a systematic and objective location, evaluation and synthesis of evidence in order to establish facts and draw conclusions concerning past events. The subject of inquiry will be based on the assumption that individuals construct social reality in the form of meanings and interpretations and that the reconstructions tend to be transitory and situational. This will be the study of a peoples representations of their history and hence linked to the study of their oral tradition. This approach counterchecks the defects of the first approach taking into account that members of a culture are often too involved in what they are doing to interpret their culture impartially. Indigenous peoples are at high risk of infection, morbidity, and mortality from COVID-19 due to pre-existing disadvantages. These include high levels of poverty, vulnerability to disease, adverse health conditions, and limited access to basic health services. This epidemiological profile, along with the remoteness of many indigenous communities, poses a significant challenge for health systems that are already strained by the pandemic. To strengthen the speed and effectiveness of emergency response interventions in indigenous territories, it is critical to coordinate with indigenous peoples in a manner that considers their sociocultural and territorial characteristics and to strengthen coordination between governments and indigenous peoples on COVID-19 management.

**Key words:** Indigenous Peoples, Health



**Implications of Coronavirus (Covid-19) on the Stability of Luo Funeral Cultural Ceremonies in Kenya**

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**Abstract**

The paper reveals the circumstances that may cause change in the Luo cultural funeral practices. One such circumstance is the emergence of COVID-19 pandemic. The COVID-19 is a global issue however it has a great impact on the Luo cultural funeral ceremonies that were basically considered very extravagant and economically impoverishing the bereaved families. The paper therefore revisits some funeral practices world over that can give the community some insights into what can be adapted to ease this endemic burden. Therefore, the study clearly demonstrates that changes in cultural rites can be as a result of some causal factors such as disease pandemics, wars, infusion of religious customs and ancestral deeds among others. In this regard, changing the Luo cultural funeral ceremonies is inevitable.

**Keywords:** Coronavirus (Covid-19), pandemic, Luo, cultural funeral ceremonies

## **Thematic Area 16: Gender**

### **The Effects of Gender Culture on Women Career Progression in a Fast Changing Environment; A**

#### **Case Study of Maasai Mara University**

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#### **Abstract**

This study examines the organization as an arena in which underlying gender cultural processes maintain gender differences and barriers, thereby limiting the efficiency of policies designed to increase the number of women at senior levels. In Maasai Mara University, being an equal opportunity employer, it is observable that there are more male than female in top management levels. Therefore, this paper seeks to evaluate the effect of gender culture on women career progression in organizations through three variables namely gender structure of the organization, gender identities of managers and gender symbolism in organizational texts. In an effort to achieve sustainable development goals, and salvage the slumping economy that has resulted from the global pandemic the world cannot afford to limit women career progression because of unfavorable gender culture.

This paper is a case study that used quantitative research design and a stratified random sampling technique to sample 60 out of the pool sample of 300 staff members at the University. Data collection was done through administering of structured questionnaires that were self-administered. The data was then analyzed through the regression analysis technique in an attempt to find the relationship between gender culture and women career progression. The findings highlight how factors of gender culture limit women career progression. However, it can also be used to provide insights on how organizations can overcome these barriers to actualize the desired access to the top management positions by women.

**Key words:** gender culture, women, career progression

**Effects of Covid-19 Pandemic on the Welfare of the Maasai Girl Child in  
Narok County, Kenya**

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**Abstract**

The Maasai girl child is vulnerable to poor menstrual hygiene, teen pregnancies, early marriages, domestic violence and female genital mutilation (FGM). Schools had temporarily offered the girls a shelter towards these challenges. However, covid-19 pandemic led to indefinite closure of schools forcing the girls back home to the full glare of these predicaments. Additionally, there was fear of the health pandemic which had also affected the economy. This study aimed at examining how covid-19 pandemic had affected the welfare of the Maasai girl child in Narok county, Kenya. A cross-sectional design of study was used. Data was collected using questionnaires and by observations. Descriptive analysis was used to analyze the data. The findings indicate that frustrations over lack of basic needs coupled with numerous domestic violence incidences caused the girls to engage in 'sex for sanitary towels'. 83.1% of the girls did not use any sex protection means while majority of the rest used ineffective methods. FGM was at its peak as there was abundant time to practice it and less government interference. In conclusion, the Maasai girls' welfare was in dire need for external assistance. Government and non-governmental organizations (NGOs) should urgently intervene to rescue the Maasai girl child.

**Keywords:** Maasai girl child; covid-19 break; teen pregnancies; early marriages; Female Genital Mutilation

**Women in STEM education and its implications on their involvement in Climate Change: A case study of female students enrolment and completion rates at Maasai Mara University**

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**Abstract**

In this study we determine the level of uptake of STEM courses by female students at Maasai Mara University in Kenya. The study employed the cohort study technique to check the female enrollment rate, graduation rate, and completion rate at the university in the past ten years. The results show that less than 40% of the students get to enroll and eventually graduate in STEM courses. The enrollment and graduation rate of female students was determined to be significantly lower than that for the male student ( $p\text{-value} < 0.001$ ). Despite the low enrollment of female students in STEM courses, the results show a positive increase in female students' completion rate. This factor illustrates that if more women can be enrolled in STEM courses, then many of them graduate and assist in making policies that can assist in curbing climate change. The results confirmed the initial assumption that few women take up STEM courses, limiting their involvement in climate change issues. The small number of females with STEM knowledge implies that women cannot effectively share their expert opinions to curb climate change. The study recommends that the campaign be scaled up to promote the uptake of STEM courses by women.

**Keywords:** Science education, Climate Change, STEM courses, University education, Women in STEM, Enrollment rate

## **The Role of a Social Worker In The Mitigation Of Child Sexual Abuse In Kisii County**

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### **Abstract**

Child Sexual abuse (CSA) is both a social and public health concern worldwide. A common misconception about CSA is that it is a scarce act perpetrated against girls by male strangers. In spite of a plethora of research on CSA, little is known about its mitigation. In the recent past in Kenya, sexual abuse has been noted in schools most of which the perpetrators go scot-free. It occurs at all levels of society and affects not only girls but also boys in all levels of the society. The purpose of this study therefore was to investigate the role of a social worker in the mitigation of child sexual abuse among pupils in Kisii County. The study utilized descriptive survey design. The sample size was 100 pupils, 100 parents, 10 Key Informants and 10 practicing Social workers. The findings of the study reveal that in order to curb child sexual abuse, the risk factors such as poverty, parental negligence and harmful traditional cultural practices should be addressed. The Social workers also need to take up their roles in the prevention, restoration and resource provision to curb CSA. The study recommends on offender registration, community notification, mandatory background check for teachers, residency restriction and sentence lengthening as a mitigation strategy to ending sexual violence against pupils.

**Key Words:** Poverty, Harmful traditional practices, offender registration, residency restriction and Social Worker

## The Susceptibility of Pupils To Sexual Abuse In Emesa Sub-Location, Kisii County-Kenya

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### Abstract

Child sexual abuse (CSA) is both a social and public health concern locally and globally. A mutual mistaken belief on child sexual abuse is that, it is uncommon occurrence committed against girls by male strangers in both rural and urban areas in Kenya. The purpose of this study therefore was to investigate the susceptibility of pupils to sexual abuse in Emesa sub-location. The study was based on four objectives, that is; to identify the etiology of sexual abuse among pupils in Emesa sub-location in Kisii county, to determine the prevalence rate of sexual abuse among pupils in Emesa sub-location, to explore the awareness level of pupils about sexual abuse in Emesa Sub-location in Kisii County and to examine mitigation strategies of sexual abuse among pupils in Emesa Sub-location in Kisii County. The study was informed by the Attachment Theory which suggests that children's lives are centered initially on their parents, the family environment being their primary agent of socialization. Systematic random sampling was used to select the respondents to ensure that the sample was a representative. The study utilized descriptive survey design. The target population was 700 pupils out of which a sample size of 100 (14 percent) pupils was selected from three primary schools in Emesa Sub-location, which include: Kabonyo, Nyabisase and Emesa primary schools. The study used questionnaires and interview schedules as tools for data collection.. Most perpetrators were not identified but majority were male. There is a significant relationship between the etiology and child sexual abuse since 80.9% of the respondents agreed walking to school, pornographic content in mobile phones and TVs, parental negligence, single parenthood, orphanage, social disorganization and poverty are the main causes of CSA. The study found out that threats from perpetrators were preventing the disclosure of child sexual abuse. The research recommends that research, programs and policies should focus on child protection. The patriarchal narrative of manhood needs to change and boys should read from a different script on their roles and place in the society. This study contributed to the knowledge base on the etiology of child sexual abuse, shedding light on the mitigation strategies and informing on culturally competent practice preventing child sexual abuse.

### Key Words

Etiology, Awareness, Sexual abuse, Prevalence, Attachment Theory, Susceptibility

**COVID-19 brings a fresh and major crisis to the education sector. What does a "new normal" for future generations look like?**

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**Abstract**

COVID-19 brings a fresh and major crisis to the education sector. What does a "new normal" for future generations look like? How can countries take advantage of the recovery period's ingenuity to "rebuild better"? This Reference frame focuses on the UNESCO-led Global Coalition for Education initiative, which is looking for ways to help learners, teachers, and governments in the recovery process, with a particular emphasis on inclusion, equity, and gender equality. The Reference frame also argues that the current crisis presents an opportunity for increased international cooperation, which could help to better focus efforts and deliver solutions, particularly through digital platforms. For future generations to navigate through the current and any future pandemics, they would need to be resilient and adaptable.

**Key words:** Covid-19, education, crisis

**SUB-THEME 3: ADAPTING TO THE NEW NORMAL IN THE ACADEMIC ENVIRONMENT:  
CHALLENGES, PROSPECTS AND OPPORTUNITIES**



## Thematic Area 17: Education

### Re-Conceptualizing Sustainable Learning: Reflections on Opportunities Post COVID -19 for Selected Universities in South Western Kenya

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#### Abstract

The COVID-19 pandemic posed a challenge to academic institutions especially when they were closed and learning had to continue online as access to quality education is a fundamental human right. The Sustainable Development Goal no 4 seeks to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. This is coupled with the Universal Declaration of Human Rights of 1948 which countries have committed to uphold. The pandemic led to approximately 1.725 billion *learners* the world over being out of school. Many institutions were caught unprepared for the new environment. The institutions implemented the online learning using different platforms to ensure continuity of learning that proved to be demanding and hectic. These events brought into focus many of the existential risks for each university and the steps that universities needed to take to maintain academic continuity during the pandemic. The study aimed at assessing the lessons learnt by the institutions of higher learning and the opportunities the pandemic presented so as to inform institutional preparedness that will ensure continuity of learning in uncertain times. Some of the lessons included the realization that teachers urgently need training in digital pedagogy in the new environment. The wellbeing of students and teachers must be taken care of as there has arisen a new issue of mental and physical wellness. Technology must be accessible to the populace for the learners to access them as among others

**Key Words:** Sustainable Learning, Opportunities, Institutional Preparedness

**Effects of Covid-19 Pandemic on The Academic Perception of  
Class 8 and Form 4 Students Towards Their National Exams: A Case Study of Narok County, Kenya**

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**Abstract**

National exams in Kenya have been seen as the bridge to better livelihoods. Passing the exams translates to more chances of selection to quality schools and professional courses. On contrary, failing these exams is perceived to render the candidate 'a community failure', with little chances of making it in life. The exams therefore carry a lot of weight in the minds of candidate students. The covid-19 pandemic resulted to indefinite closure of learning institutions. This closure affected many dynamics responsible for candidates' performance in their national exams. A study was hereby conducted aiming to assess how the pandemic had affected candidates' (class 8 and form 4) perception towards national exams in Narok county, Kenya. The research used a mixed design involving a casestudy and cross-sectional design of study. Questionnaire guides were used. Descriptive statistics were used to analyze the findings. The findings indicated that the candidates' perception of passing in essential subjects were completely altered. The pandemic had also made the learners to switch their dream professions. The study found out that there was little online learning activity with numerous excuses for the same. Most of the learners indicated that their perception on school resumption largely dependent on how the government would contain the pandemic. In conclusion, the pandemic had significantly ruined how the learners perceived national exams. The authors recommend all education stakeholders to move with speed in ensuring the candidates are engaged with learning activities either online or through community-based learning platforms.

**Keywords:** Class 8 and Form 4 candidates, covid-19 pandemic, perception towards national exams

## **The Effect of Leadership Practices On Employee Performance In Public Secondary Schools In Kenya**

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### **Abstract**

The aim of the research was to identify the effect of leadership practices on employee performance in state owned schools. This research was guided by Herzberg's Two Factor Theory, Mc Gregory's Theory X and Theory Y, Abraham Maslow's Hierarchy of Needs, Transformational leadership Theory and Human Capital Theory. The target population consisted of 23,147 employees in public secondary schools in Kenya. The research assumed a mixed research design. A sample size of 393 respondents was used through stratified random sampling. The strata represented all the teachers. The instruments used in the study were the questionnaires. Structured questionnaires were developed and pretested; a pilot study was conducted to help establish content validity and reliability of the instrument. Content validity of the instruments was verified by experts from the university department while reliability of the research data collection tool was assessed using constant of alpha that needed to be at least 0.7 in social sciences. From the findings, the reliability test of leadership practices was 0.800 the research instrument was reliable. Statistical information collected was explored with the aid of statistical tool of analysis. Both descriptive and inferential statistics that included the mean, frequencies, correlation and regression analysis were used. From the study findings, the correlation between leadership practices and employee performance was positive and significant. This means there measurably positive connection when leadership practices were related to employee performance. The study concluded that there is a measurably positive connection amongst leadership practices on employee performance. On recommendation, the study encourages management of public secondary schools to proactively provide good leadership to improve their performance. The inquiry was done in public secondary schools in Kenya. Future researches are encouraged to cover private secondary schools and compare the findings. The study forms a basis for reference as empirical literature by researchers and any other interested parties in future.

**Key words:** Leadership, employee performance, public secondary

**Post Covid -19 Pandemic Economy: Building Resiliency in Teaching and Learning environment and Compliance with Infrastructure requirement in Universities in Kenya**

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**Abstract**

The universities in Kenya have been affected by recent outbreak of Covid – 19 pandemic. Building of resilient learning environment are essential in preventing and reducing the severity of educational problems such as disruptions and closures. Equipping learning institutions with coping skills and protective support systems can help them react positively to changes and obstacles in provision of education in extreme events or sudden shocks. Resiliency covers not only the ability to be able to persist and bounce back, but also the ability to learn from and respond and bounce back better. The paper looks at policy and practices for resiliency; Coping skills and support systems in universities; Compliance to operational resiliency in universities; challenges for achieving infrastructure resiliency and mechanism for improving infrastructure during the pandemic. This systematic review studies of primary and secondary data was used in this study. The primary data was sources included discussions, checklist and observations while secondary data sources included retrieval from journals, books and internet sources. The results show that clear policy framework such as physical distancing, staggering start of opening days and use of temporary open places. The coping skill is being enhanced through training and use of ICT and other digital systems. Though finances has been a challenge government is putting mechanism in place such as offering financial breaks for attachment and other support programs. It was recommended that the Universities sub – sector accept the risk and manage internal challenges with resources available and then seek external funding for investment in infrastructure resilient systems.

**Key Words:** Compliance; Covid–19; Education; Infrastructure; Learning Environment; Teaching.

**Digital literacy and effectiveness of online learning among pre-primary school learners with special needs in narok county.**

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**Abstract**

Application of technology in teaching has been witnessed across many countries in the world, however, not much has been done to adequately assess the level of digital literacy key in the application of digital learning in schools in Kenya. The COVID-19 pandemic has exposed teachers' preparedness to digital learning across all learning institutions. The paper sought to assess the effectiveness of online learning by assessing the level of digital literacy among the pre-primary teachers, parents and the learner who have special needs in public pre-primary schools in Kenya. The study took a descriptive design and targeted teachers, parents, and learners from 20 public pre-primary schools in Narok County, Kenya. The validity of the instruments was determined using experts in survey research design, who analyzed and judged the suitability of the instrument's items to the study objectives. The study purposively selected 20 public pre-primary schools from which teachers and parents with pre-primary learners were selected. Qualitative data were analyzed thematically along the study objectives and presented in narrative forms. Quantitative data were analyzed using descriptive statistics such as frequencies, percentages mean and standard deviation and inferentially using Pearson's Product Moment Correlation Analysis with the help of Statistical Packages for Social Science (SPSS Version 23). The results present various aspects and challenges facing the application and use of digital literacy in basic education such as access to technology and the ability to use the technology. It was established that lack of skills in using the technology among pre-primary learners reduces their concentration making online learning unproductive. The study concluded that Kenyan schools need to prioritize training of teachers in the use of technology which is a prerequisite knowledge in guiding learners. The study concludes that teachers were not prepared for digital teaching with challenges in using technology. The study recommends that schools should take the initiative to develop appropriate framework for them to enhance digital literacy among all other stakeholders.

**Key Words:** Digital literacy, Innovation, ICT, Pre-primary school, education sustainability, Special needs education.

**DETERMINANTS OF EMPLOYEE PERFORMANCE AT THE MINISTRY OF  
EDUCATION HEADQUARTERS IN KENYA**

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**Abstract**

This study seeks to establish the determinants of employee performance at the Ministry of Education in Kenya. The specific objectives were; to determine the effect competence level on employee performance at the Ministry of Education in Kenya and to establish the effect of organization culture on employee performance at the Ministry of Education in Kenya. The study was grounded on hierarchy of needs and Durkheim's theory of culture. The study adopted descriptive cross-sectional survey. The study population composed of 623 employees at the management levels currently working at headquarters of ministry of education in Nairobi City County. Krejcie and Morgan formula was used to establish the sample size of the study. Data was gathered using questionnaire. Data was analysed using SPSS version 23. Pearson R correlation was used to measure degree and direction of the linear association between the variables. Multiple regression models were fitted to the data in order to test the influence of the independent variables on dependent variable. The information was displayed by use of bar charts, graphs, tables and pie charts. The study found that competence level positively and significantly influences employee performance at the ministry of education headquarters in Kenya; organization culture positively and significantly influences employee performance at the ministry of education headquarters in Kenya. There is need for more attention to be focused on the education level, which will lead to the production of employees that are competent and attract foreign direct investments. There is need to adopt a culture that allows employees views, opinions and suggestions to be taken into consideration when making decisions. Also, ministry of education should adopt transformational style role with leadership qualities such as role modelling, perseverance, empathy, pragmatism, visionary, innovative, coaching, stimulating, and valuing employees so as to enhance staff performance.

**Key words:** Employee performance, competence, organization culture

## **Modes Of Financing Higher Education and Their Implications On Students' Performance, Quality Of Education And Completion Rates: An Experience Shared From Maasai Mara University, Kenya**

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### **Abstract**

The Kenyan Government has put into place methods of financing higher education with the intentions of improving on access, quality, equity and completion rates of students. In the face of increased poverty and vulnerability and with inter-sectored competition for national financing, there is need to rethink on the sustainability of methods of funding higher education. The government provides student loans, bursaries and meets all development expenditures as well as capitation for wage rates. The parents/ household are expected to contribute towards tuition and upkeep of students while in the universities. The issue of accommodation is challenging as increased number of student's enrolments has forced university management to ask students to make private arrangements towards the same. A good numbers of students both regular and privately sponsored do get loans from HELB. However, at the end of each semester fifty percent of students defer their studies as well as examinations. There is need to find out how sustainable methods of financing education are and their implications on the quality of education received by students, access, and completion rates in higher education institutions with a shared experience from Maasai Mara University, Kenya. The study objectives were to; establish sources of funding higher education in Maasai Mara University, establish the implications of modes of funding higher Education on students' access to education, quality of education received, performance and completion rates. The study employed descriptive survey design. The target population was 500 fourth year and 450 third year students. The sampling method employed was stratified random technique and the sample size was 150 fourth year students and 150 third year students. Findings revealed that 80% of the students involved in the study depended on funding from the government; Higher Education Loans and support from the family households. Results further revealed that this mode of funding affected students' performance, completion rates and access to education. The study concluded that, the current modes of funding higher education were not reliable as students were barred from taking exams or even deferred their studies, which resulted to poor performance and cases of missing marks as well taking too long to complete their studies. The study recommended that the management of Maasai Mara university should look for alternative modes of funding higher education to support students from poor families to complete their studies in time.

**Key words:** Quality education, Access to education, Completion rates, educational equity.

## **Parental Challenges in the Era of COVID-19**

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### **Abstract**

Learning begins before a child first walks into a classroom, and so can lifetime advantages and disadvantages be worked on. The skills developed in early years of childhood, forms the basis for future learning and labour market success, making early childhood a critical time of human capital accumulation. Researchers in early childhood argues that investment in ECE should be viewed as a public good with higher rates of return than interventions directed at older children. Advocates of the child argue with increasing evidence that ECE should be a major priority on a country's development agenda, at home as well as in class. Although early childhood is a period of great potential for growth and development, it is also a time when children are especially vulnerable to being left behind or on their own. Despite the overwhelming case for building strong early foundations, ECE remains a peripheral concern within education systems and virtually everywhere, characterized by insufficient resources and fragmented planning. Household poverty, low levels of parental education and lack of parental involvement in children's education are three of the most critical barriers to early childhood programmes. Holistic development and early interventions are the most cost-effective measures that a child can be given during this stage of child's growth and development. Such measures minimize the need for special interventions, have the most significant impact on children's development and learning and have a decisive and lasting influence on how children grow to adulthood. The longer the parents and the society waits to intervene in the life cycle of a disadvantaged child, the more costly it is to put right.

**Key words:** education, parental challenges, ECE



**Influence of Entrepreneurial Risk-Taking Practices on Organizational Performance of Basic Education Enterprises in Kenya**

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**Abstract**

The purpose of this study was to examine the entrepreneurial risk-taking practices that influence performance of Basic education enterprises in Kenya. The study was guided by the following objective: to establish the influence of entrepreneurial risk-taking practices on performance of Basic education enterprises in Kenya. Many basic education enterprises keep on collapsing from time to time globally. The COVID 19 has worsened the collapse of the basic education enterprises, statistics indicate a dire state in Kenya in the basic education sector. An entrepreneurial risk-taking practices model need be identified that basic education enterprises can utilize in enhancing their organizational performance. This study used a cross-sectional survey research design. The target population for the study was the 886 registered, single owned Basic education enterprises in Kenya and that have been in operation for more than fifteen years. A Sample size of 106 Basic education enterprises obtained through a simple random sampling which corresponded to twelve percentage of the target population of 886 Basic education enterprises in Kenya was selected. Data for the study was collected using questionnaire. The data collected was organized, analysed and interpreted based on the study objectives using descriptive approaches with the help of statistical package for social sciences (SPSS) a tool for data analysis. Data was analysed through multi- linear regression analysis and, one-way ANOVA used to determine if there were significant relationships between variables that were being compared. The study undertook diagnostic tests in order to decide the worthiness of the data gathered in drawing population conclusions. Data is presented in form of tables and frequencies to infer entrepreneurial risk taking practices influencing organizational performance of Basic education enterprises. The study found out that entrepreneurial risk-taking practices, has a positive and significant influence on performance of basic education enterprises in Kenya. Therefore, the study concluded that entrepreneurs with entrepreneurial risk-taking practices base their activities in taking calculated risks and manages them efficiently on their path to success. Therefore, the study recommends that basic educational enterprises ought to embrace proportionately key entrepreneurial risk-taking practices as a way of enhancing the performance of their enterprises.

**Key words:** Basic, Education, Enterprise, Entrepreneurial, Performance, Practices, Risk taking

## The Influence of E-Learning Technology Strategy on Learner Goals Achievement in The Kenyan Universities

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### Abstract

Universities have come up with various e-strategies to deal with great market forces emanating from the need to adapt to the new normal in the academic environment, dynamic technological advancement, increasingly diverse student bodies, their changing needs and expectations as well as heightened demand for new and different programs and services. Despite the many initiatives to support e-learning, most e-learning strategies are not fully realized for successful learner goals achievement due to inadequate technology strategies, poor content strategy, insufficient administrative support strategies, poor communication marketing strategies and inadequate change approach. Thus, the purpose of the paper was to establish the influence of e-learning strategy on learner goals achievement: moderating role of change approach in Kenyan universities. The target population was 16 universities offering e-learning with a total of 29608 participants, comprising of 26761 e-learners and 2847 e-lecturers. The sample consisted of 351 e-lecturers and 394 e-learners because they both interact more with the e-learning system that uses currently implemented e-strategies. Sample was determined by Slovin's formula as it allows a researcher to sample the population with a desired degree of accuracy. Stratified random sampling, a method suitable when subpopulations within an overall population vary was used to identify sample size in each of the 16 universities. Primary data was collected using questionnaires with a Likert scale types of questions. Questionnaires were distributed through emails and received back through the same medium due to Covid-19 pandemic situation. The questionnaire was pre-tested to 32 respondents comprising 10-e-lecturers and 22 e-learners from 1 university within Nairobi County. Descriptive statistics was used. Binary logistic regression analysis was used to regress relationship between learner goals achievement with each variable and was accompanied by relevant explanations. Results revealed that e-learning technology strategy, e-learning content strategy, e-learning communication and change approach have a statistically significant relationship with learner goals achievement while e-learning administration support has no significant relationship with learner goals achievement. An empirical model linking e-learning strategies, learner goals achievement and change approach as the moderator was developed to help e-learning managers with insight on successful identification and implementation of e-learning strategies to achieve learner goals. Further future research suggestions was made to enrich the body of knowledge.

**Key words:** e-learning strategies, Learner goals achievement, proposed e-learning strategy implementation model

## **Adapting to The New Normal; The Learning Design challenge in Higher Education**

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### **Abstract**

The United Nations general assembly came up with a global development plan up to the year 2030. In Kenya, it was launched in 2008 as Kenya's development blueprint. The purpose was to make Kenya a middle-income country capable of providing high quality life for all its citizens by the projected year of 2030; hence referred to as Kenya vision 2030. Sustainable Development Goal 4 deals with Quality Education which should focus on inclusivity, equity and promoting lifelong learning opportunities for all. The COVID-19 pandemic has had an intense impact on the delivery of higher education. The study established whether the learning designs that were used to ensure access and continuity had any challenges. The findings revealed that some digital platforms were used without having structured learning designs. The challenge was ensuring that the lessons were learner centred, designing for active learning, and the teacher presence during asynchronous mode of delivery. The study recommends training of academic staff on the use of short instructional video clips to: introduce the lesson in a memorable manner, emphasize on the abilities to be acquired by the learner, act as a bridge between synchronous and asynchronous designs, make use of non-verbal cues that aid learning in line with inclusivity, summarise the lesson and link it to the next one. Pedagogical support should be provided for synchronous interaction and engagement with students, highlighting on the abilities to be acquired by learners using the learner centred outcome-based approach to learning.

**Key words:** new normal, Covid-19, challenges, learning design, quality higher education.

## **The Implication of COVID -19 Pandemic to Implementation of Competency-Based Curriculum in Kenya**

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### **Abstract**

Innovative ways have to be designed to adapt to the new normal in the academic environment amidst challenges. The COVID-19 pandemic has hit hard teaching, learning and assessment which are the core of the education sector. The World Health Organization and Ministry of Education COVID-19 prevention response protocols which include keeping social distance and wearing mask disorganized learner centred teaching learning strategies for curriculum implementation based on the social interaction theories which anchor effective learning and underpin the Competency Based Curriculum (CBC). This study reviewed the CBC lower primary level curriculum designs, Volume two which was introduced in Kenya primary schools in 2017. The objective of the study was to explore subject areas demanding social interaction and reimagine innovative ways which could be used to deliver the curriculum for effective learning and still observing the COVID -19 prevention protocols or any other such situation in future. The theory guiding the study was Vygotsky's Social Cultural theory which hold that teaching and learning are highly social activities which benefit from social interaction and advocates interactive learning. Means of presenting content where learners experience social interaction and learn observing the COVID -19 protocols were explored. The methodology employed was content analysis of the curriculum, teacher professional development and Massive Open Online Course resources used to develop learner centred skills for teachers who have never experienced it. Qualitative data was gathered and organized in themes which indicated that some subject areas require rethinking and further guidance to teachers. There are Online resources which could be used for learners to learn without too much physical social interaction. This research may benefit Kenya Institute of Curriculum Development, Ministry of Education and interested education development partners.

**Key words:** Implementation, pandemic, COVID -19, Competency-Based

## **COVID-19 Pandemic And Possible Trends For The Future Of Higher Education: A Review**

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### **Abstract**

COVID-19 pandemic resulted in the abrupt closure of higher education institutions globally. Through a desktop review, this paper explores possible influences of the pandemic on the future of higher education. The pandemic disrupted teaching, research and community service in higher education. There has been loss in revenue streams and human resources. To mitigate disruption on the academic calendar, institutions leveraged Information Communication Technology (ICT) to deliver administrative services and emergency remote teaching. A new equilibrium of disrupted classes with undisrupted learning through virtual platforms emerged. Some amplified challenges in the new norm include unreliable internet connectivity, access to ICT infrastructure and preparedness for online pedagogy. Other difficulties include online delivery of science, technology, mathematics, practicals and quality assurance. Inequalities have been magnified between learners, institutions and countries in response to COVID-19 pandemic. The study ultimately contends progressive uptake of blended learning as the new frontier in higher education. Institutions require capacity building on online pedagogy, greater investment in ICT infrastructure and a holistic e-learning quality assurance framework that infuses achievement of desired learning outcomes with Maslow Hierarchy of needs. In adapting to the new normal in the academic environment, a paradigm shift is expected towards the entrepreneurial university, institutional mergers and strategic planning that incorporates disaster management.

Key words: covid-19, higher learning, academic environment

## **PREPAREDNESS IN THE IMPLEMENTATION OF COMPETENCY BASED CURRICULUM**

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### **Abstract**

Education is fundamental to development of human resource capacities for sustainable economic growth and development. By imparting new skills and knowledge in people, education expands human capabilities, increases labour productivity and enhances essential participation and partnerships in nation building. Education is a vital tool in achieving greater autonomy, empowerment of the people and addressing gender gaps in the distribution of opportunities and resources. More equitable distribution of opportunities and resources between men and women which leads directly to higher economic growth and productivity. The right to education revolves around two universally accepted declarations or goals; the Universal Primary Education (UPE) by 2015, later refocused as Education for All (EFA), as articulated in Jomtien, Thailand, in 1990 and reaffirmed at the Dakar (Senegal) World Education Forum in April 2000. In September 2000, the United Nations General Assembly adopted the Millennium Declaration to achieve universal completion of primary schooling and achieve equity in access to primary and secondary schooling by 2005 and at all levels by 2015. The country is almost there though struggling. Kenya has made considerable achievements in provision of education and training. This is fundamental to the success of the government's overall developmental strategy. However, the determinant to the development of quality human resource is the education curriculum offered in the learning institutions. This is central to the attainment of the national goals and achievement of the millennium development goals in the country. (EFA Global Monitoring, 2004). E.g The Gross enrolment rate (GER) in primary schools has risen from 50% in 1963 to 104% in 2002 after the implementation of Free Primary Education. The country's GER in pre-school education marked a remarkable 40% in 2001 higher than the median of sub-Saharan Africa (5.8%) and compared with developing countries at 35%. This is quite commendable. However, this has not been without challenges in the education sector. From the management to finances, facilities, population in classes, teaching, parental involvement among other problems. The new curriculum has changed the duration in schools from 2-7-4-2-3 curriculum to 3-8-4-4 to the current 2-6-3-3 for the Competency based curriculum.

**Key words:** education, curriculum, CBC

**Positive effects and Challenges in Integration of ICT in Teaching and Learning Mathematics in Secondary Schools, Meru County, Kenya.**

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**Abstract**

This study is based on a study in Meru County whose purpose was to explore the various positive effects and challenges affecting integration of ICT in teaching and learning Mathematics in secondary schools in Meru County. This study adopted a descriptive survey design. Three instruments questionnaires', a structured interview schedule and an observation checklist were used to collect data. The study was carried out in fourteen public secondary schools in Meru County. Data was analyzed using descriptive statistics. Findings from the study indicated that, teachers face major challenges such as developing their own technological skills and knowledge as well as self-training in the use ICTs in their teaching. This lack of capacity building support was found by the study to contribute to teacher lax in integrating technology in their teaching in spite of the enthusiasm. This study recommends that new ways on technology integration be made accessible to both teachers and students for learning purpose especially during the Covid-19 period to avoid contracting the virus and also to give information and capacity building in technology integration be increased for teachers and awareness be built among pre-service teachers' trainees integrating ICT in teaching and learning Mathematics. The study found out that the key challenge was providing finances to facilitate schools to have ICT infrastructures and training teacher's personnel to teach ICT in Meru County secondary schools in particular and in Kenya as a whole.

**Key words:** ICT infrastructure, learning, schools preparedness

**Relationship Between Principals' Integration of Students' Councils, Open Forums' Change Strategy In School Management And Students' Academic Performance As Perceived By The Teachers In Public Secondary Schools In Nairobi County, Kenya**

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**Abstract**

In a rapidly changing era, educational change management has become one of the crucial tasks for better students' academic performance. Globally and regionally, educational changes are made in partnership with teachers and students so as to foster holistic changes. Principals are charged with the responsibility of creating an environment for students' academic success. School-wide change is comprehensive change in the curriculum, change in departments and teachers' modern methods of teaching and un-expected change. The purpose of this study was to examine principals' use of students' council and open forums in educational management for academic success during the COVID-19 pandemic. The study used cross-sectional descriptive survey designs to collect data using teachers' questionnaires. The target population comprised of public secondary schools in Nairobi County. The schools were stratified to categories; national, extra-county, and county schools to ensure equal representation during sampling. Stratified simple random sampling methods were used to select schools, principals and teachers. The study found that teachers' perceptions towards principals' management by use of students' councils and open forum strategy was significantly related to academic performance. Moreover, use of ICT in teaching and learning contributed to students' motivation as teachers improved methods of teaching. The study concluded that when students' councils and open forum change strategy is used, students' academic performance improves greatly. The study recommends that principals in schools should incorporate the students' governance as part of the school-wide change since it influences students' improved academic performance.

**Keywords:** teachers' perceptions, students' council, open forums, academic performance, and public secondary schools.



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### **CONTACTS**

For more information, please contact us through the addresses indicated below. You can also log on to our website **[www.mmarau.ac.ke](http://www.mmarau.ac.ke)**

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