



BOMET UNIVERSITY COLLEGE
(A Constituent College of Moi University)

EVENT PROGRAMME AND BOOK OF ABSTRACTS

**THE 4TH BOMET UNIVERSITY COLLEGE ANNUAL INTERNATIONAL
CONFERENCE AND 2ND OPEN DAY & INNOVATION COMPETITION**

**THEME: RESEARCH, INNOVATION AND OUTREACH:
COMMERCIALIZATION FOR SUSTAINABILITY**

13TH AND 14TH MARCH, 2025

VENUE: BOMET UNIVERSITY COLLEGE



PREAMBLE

Bomet University College (BUC) was established as A Constituent College of Moi University through the Legal Notice No. 145 published in the Kenya Gazette Supplement No.114 of 27th July, 2017. The University College is expected not only to help the Government of Kenya increase access to University education but also to put greater emphasis on hands-on training for skills development and Academic Excellence. Bomet University College is now Kenya's sole University that has carved out a Niche as a "Green Economy for Sustainability" driver. As a result, the Academic Programs and the University's Motto, "Green University for Sustainability," both of which are housed at BUC, all reflect parts of the Green Concept for long-term development. Bomet University College is engaged in research in a wide range of fields, with a particular emphasis on the implementation of its Niche "Green Economy for Sustainability." The University has capacity in terms of staff and facilities. It has qualified staff employed across its four Schools: School of Business and Entrepreneurship, School of Arts and Social Sciences, School of Education and School of Pure and Applied Sciences. The University has a well- established Research, Innovation, Training and Extension Department that is charged with the responsibility of Coordinating Research, Consultancies, Innovations and Extension Services. Furthermore, besides the Research Policy that governs all activities relating to research, the University Management has a reporting structure that ensures smooth monitoring and evaluation and Quality Assurance during the conduct of research and innovation related activities to ensure compliance within the provided framework.



DAY ONE: THURSDAY, 13TH MARCH 2025

| TIME | ACTIVITY & DESCRIPTION | RESPONSIBILITY |
|---|--|---|
| 8.00- 9.00 AM | - Arrival and Registration of Guests and Participants -Ushering in Participants to various competition venues | Event Committee |
| EVENT ONE: INNOVATION COMPETITION Event Chair (Dr. Florence Anyonje) | | |
| 9.00-1.00 PM | - High School Category A (SR 106) | Chair of Session: Dr. Anyonje Rapporteur: Mr. Wycliff Ondiek |
| | - High School Category B (LT 104) | Chair of Session: Dr. David Melly Rapporteur: Mr. Enock Kimutai |
| | - TVET Category (SR 004) | Chair of Session: Dr. Eliud Nalianya Rapporteur: Ms. Angela Sionik |
| | - University Category (LT 101) | Chair of Session: Dr. Fredrick Wafula Rapporteur: Dr. Tecla Tuwei |

| 2.00 PM | THE OFFICIAL OPENING CEREMONY AND RECOGNITION OF BEST INNOVATORS VENUE: MULTIPURPOSE HALL | RESPONSIBILITY |
|---------|--|--|
| | - Grand March by St. Mary's Girls Secondary School Band | Ms. Winnie Mutai |
| | - Prayer by Dr. Mrajah and Joint Anthem by BUC Choir and St. Mary's Band | Head of Student Affairs Dr. Waweru Mureithi |
| | - Remarks by Chair of the Event Committee | Dr. Wambongo CS. Recha |



| | | |
|--|--|---|
| | <ul style="list-style-type: none"> - Remarks by Head of Research, Innovation, Training and Extension - Head of Research, Innovation, Training and Extension to Invite the Deputy Principal, Academic and Students Affairs to give Remarks | Event Chair Committee |
| | <ul style="list-style-type: none"> - Remarks by Deputy Principal, Academic and Students Affairs - Deputy Principal, Academic and Students Affairs to invite Deputy Principal, Administration and Finance to give Remarks - Deputy Principal, Academic and Students Affairs to welcome the Principal to give Remarks | Head of Research, Innovation, Training and Extension |
| | <ul style="list-style-type: none"> - Remarks by the Principal, Bomet University College, Prof. Charles Mutai. The Principal to introduce Guests, BUC Council and Chief Guest | Deputy Principal, Academic and Students Affairs |
| | <ul style="list-style-type: none"> - Remarks by BUC Council Chairperson Prof. Simon Mitema | Principal |
| | <ul style="list-style-type: none"> - Speech by the Governor, Bomet County Prof. Hillary Barchok and Other Elected Leaders in Bomet County | Council Chairperson |
| | <ul style="list-style-type: none"> - Speech by the PS, State Department for University Education and Research, Ministry of Education Hon. Dr. Beatrice Muganda Inyangala | Council Chairperson |
| | <ul style="list-style-type: none"> - Speech by the Cabinet Secretary, Ministry of Education Hon. Julius Ogamba EGH | Council Chairperson |
| | <ul style="list-style-type: none"> - Recognition of Staff members dedicated to Research Related activities | Principal assisted by DPAF to invite Chair of Council to award certificates of Recognition to Staff members |
| | <ul style="list-style-type: none"> - Recognition of best innovators in each of the categories | Principal assisted by DPASA to invite the chief guest to award the best innovators |
| | <ul style="list-style-type: none"> -Vote of Thanks | Chairperson of Council Academic Committee |



| | | |
|------------------|----------------------------|--------------------|
| | Closing Prayer for day one | Dr. Richard Rotich |
| DEPARTURE | | |

DAY TWO: FRIDAY, 14TH MARCH 2025

| TIME | ACTIVITY & DESCRIPTION Venue (Main Boardroom) | RESPONSIBILITY |
|--|--|--|
| 8.00- 9.00 AM | - Arriyal and Registration of Guests and Participants -Ushering in Participants to the various Break Away rooms | Dr. David Melly Dr. Tecla Tuwei |
| <i>Conference Zoom Link for Virtual Participants</i> | | |
| PAPER PRESENTATIONS | | |
| 9.00-1.00 PM | - Breakout Room 1 (SBE) Venue SR 003 See Time Schedule in Appendix A | Chair of Session: Dr. Philip Bii Rapporteur: Ms. Brenda Makanda |
| 9.00-1.00 PM | - Breakout Room 2 (SASS) Venue SR 005 See Time Schedule in Appendix A | Chair of Session: Dr. Mohammed Mraja Rapporteur: Ms. Hilda Nafula |
| 9.00-1.00 PM | - Breakout Room 3 (SOE) Venue LT 101 See Time Schedule in Appendix A | Chair of Session: Dr. Tonny Okwach Rapporteur: Ms. Dinah Ayomah |
| 9.00-1.00 PM | - Breakout Room 4 (SPAS) Venue LT 105 See Time Schedule in Appendix A | Chair of Session: Prof. Fredrick Kengara Rapporteur: Ms. Gwendolyn Macharia |
| 1.00-2.00PM | LUNCH BREAK | |



| KEY NOTE ADDRESS AND OFFICIAL CLOSING CEREMONY IN MPH | | RESPONSIBILITY |
|---|---|--|
| 2.00 PM | Prayer by Dr. Clement Nkaabu | MC |
| 2.00-2.40 PM | -Keynote Address by Prof. Dickson Andala, Chief Executive Officer-National Research Fund-Kenya -Questions and Answers Session | Deputy Principal, Academic and Student Affairs |
| 2.40PM | - Remarks by the Principal | Deputy Principal, Academic and Student Affairs |
| | - Official Closing of the Event by the Chairperson of the Council | Principal |
| | Vote of Thanks | Chair, Academic Committee of Council |
| | Closing Prayer by Dr Teclah Tuwei and Anthem by BUC Choir | MC |



MESSAGE FROM THE CHAIRMAN OF COUNCIL



PROF. SIMON MITEMA

It gives me great pleasure to welcome you most cordially at the Official Opening of 4th Bomet University College International Conference, 2nd Open Day & Innovation Competition. This event touches a very important strategic area in academic excellence in Research, Innovation and Extension. Bomet University College (BUC), takes pride in its great strides since its inception as a Moi University Campus and later on gazettelement as a Constituent College of Moi University.

Our obligation to ensure that the University College attains Charter in the next five (5) months is depicted in the rigorous evaluations of the institution's academic programs, governance structure, and adherence to established standards of quality. This therefore, underscores our commitment to serving not just our immediate community but also the wider national and international landscape. Our vision is rooted in the Philosophy of becoming a Premier Green University, fostering Research Excellence in Science, Technology, and Innovation for sustainability. Our goal is not only to impart knowledge but to instill in our Students, Staff, and Stakeholders a sense of Accountability, Commitment, Integrity, Patriotism, and Respect. Today, as we gather here to deliberate on the ways of navigating an increasingly complex world, the role of university research and innovation extends far beyond the confines of academia. Our endeavors must not only generate new knowledge but foster creation of Patentable Intellectual Properties (IP) that can prosper the National Agenda on Industrialization through IP Commercialization. This indeed resonates well with the carefully chosen theme of the event which is *"Research, Innovation and Outreach: Commercialization for Sustainability"*. Furthermore, the 4th Bomet University College Annual International Conference and 2nd Open Day & Innovation Competition echoes well with our Strategic Goals *"to provide a vibrant intellectual climate for quality scientific research and innovation,"* and *"to conduct community outreach and engagement for the advancement of humanity."* On behalf of Bomet University fraternity I wish to express our sincere gratitude to Moi University for their invaluable mentorship and support, which has been instrumental in the growth and development of Bomet University College. Their provision of relevant and accredited Academic Programmes, Quality Assurance in Teaching, and Academic leadership have laid a solid foundation for our success. I extend heartfelt appreciation to the Ministry of Education, the State Department for Higher Education and Research, and the County Government of Bomet for their unwavering support and commitment. Your



presence here today underscores the collaborative effort required to nurture and expand the horizons of Bomet University College. As we embark on this intellectual journey together, let us celebrate the diversity of thought, culture, and perspectives that make international conference transformative. May this conference serve as a platform for Allogamy of ideas, radiating innovations that will shape the future of our respective fields. Thank you for being a part of this global scholarly community, and we look forward to the enlightening discussions and discoveries that await us after the conference.

Thank you.

MESSAGE FROM THE PRINCIPAL



PROF. CHARLES MUTAI

It is with great honour to welcome you the 4th Bomet University College Annual International Conference and 2nd Open Day & Innovation Competition. The University College is a Constituent College of Moi University, established by Legal Notice No. 145, gazette on 27th July, 2017.

Currently, the University College has a student population of over 4000 and a staff establishment of 158. Bomet University College admitted its first cohort of Government Sponsored Students Programme (GSSP)

students on 31st August, 2016 as a Campus of Moi University. It is indeed, a great pleasure for me to welcome you join the Bomet University College fraternity in marking this day which is the culmination of many days of hard work and dedicated effort by all. Let me at the onset sincerely congratulate all the innovators, scholars and exhibitors for the great effort made in participating in this wonderful event which is a testimony that Bomet University College has come of age as a disseminator of cutting edge research output. It is my sincere hope that the knowledge gained here will go a long way in solving challenges facing our society. We are all aware that global challenges amongst them the COVID-19 pandemic came along with many challenges to the education sector as a whole. This phenomena propelled matters of sustainability to centre stage. Academic programmes were adversely affected when many universities were closed abruptly as a containment measure. In this regard, I wish to applaud Bomet University College for ensuring continuity of learning during the turbulent period through blended mode. A salutary achievement is that this event is also being held on a blended platform. Indeed, going forward, opportunities abound that you can exploit in the arena of Innovation and Technology. I salute Bomet University College for joining the global conversation on Sustainability with the conference theme of “*Research, Innovation and Outreach: Commercialization for Sustainability*”. Indeed Bomet University College’s Niche “*Green Economy for Sustainable Development*” has positioned you at the heart of the Global needs. Further, I am glad to note that this International Conference promotes Kenya’s



efforts to make an impact on with Agenda 2063 for Africa and the United Nations Sustainable Development Goals (SDGs) 2030. Significantly, Kenya has committed on Nationally Determined Contributions (NDCs), the mechanism for the implementation of the 2021 COP26, the 26th United Nations Climate Change conference the landmark climate change mitigation strategy to limiting global warming by reducing greenhouse gas emissions.

Universities have a mandate to contribute to the National, Regional and Global social-economic development through Research and Development. As universities we are encouraged to form Research and Innovation consortia as a strategic way of enhancing their visibility and synergy. I urge academic experts, researchers and innovators in different fields to come up with innovative products that can greatly contribute national BETA Agenda. I once to bring to your attention that Bomet University College has instituted Business Incubation Committee that is currently at the stage of developing mentorship modules that will go a long way in mentoring and incubating best talents and innovations among researchers and innovators. This endeavour will support BUC endeavour in supporting research and innovation to commercialization.

With the implementation of the Competency-Based Curriculum system of Education now underway, universities are likely to be caught unawares and unprepared unless they move with speed to review their curricula and reorient them from knowledge-based to competency-based. The reorganization of academic schools, faculties and departments will become necessary, before students' who are already following the new curriculum join universities. I am delighted to inform you that BUC has rolled out an aggressive programme to re-tool our staff members to be ready to absorb the CBC class come 2029. BUC is sincerely indebted to the Government through the Ministry of Education, State Department of Higher Education and Research, for the support towards the development and growth we have realized so far as a University College.

The Leadership and entire community of Bomet Country is instrumental in the success of Bomet University College. We sincerely appreciate the support that the university College Management, Staff are Students are receiving from the Stakeholders in the county. We are committed to nurturing harmonious relationships to enables peaceful co-existence and prosperity for all in this County. The University contributes significantly to the steady growth of the economy of Bomet town and the County at large.

I wish you fruitful deliberations.

THANK YOU





PROF. GEORGE OTIENO ORWA

I am pleased to extend a warm welcome to you for our upcoming 4th BUC Annual International Conference, 2nd Open Day, & Innovation Competition. This event, themed "*Research, Innovation, and Outreach: Commercialization for Sustainability*," reflects BUC's Vision of becoming a Premier green University, dedicated to fostering research and excellence in Science, Technology, and Innovation for sustainable development.

The hosting of the event holds significant importance for Bomet University College as it aligns with our Core Mandate and demonstrates our commitment to our Vision, Mission, and Niche. This year's Conference, Open Day and Innovation Competition will serve as a vibrant platform for the exchange of ideas and celebration of innovations within Bomet University College (BUC), Technical and Vocational Education and Training institutions (TVETs), and Secondary Schools in Bomet County, showcasing the regions potential in Science, Technology and Innovation. It will also be an opportunity for Participants to engage with researchers and experts, explore cutting-edge research focused on green solutions for sustainable development, and participate in the Open Day to learn more about BUC's Schools, Departments, and Academic Programmes. This Event presents a valuable opportunity for students and members of faculty to expand their knowledge and perspectives on sustainability, network with peers and professionals from diverse fields, and contribute to the development of green solutions for a better future. I would like extend my heartfelt gratitude to the dedicated planning Committee for their tireless efforts in organizing this exceptional Event. Their commitment, planning, and collaborative spirit have been instrumental in shaping this Event into a platform for groundbreaking ideas and impactful discussions. Your participation will undoubtedly contribute to the success of this Event and reinforce Bomet University College's position as a Champion of Greening and Sustainability.



Thank you.



PROF. LOICE CHEMNGETCH MARU, PhD
*Professor of Entrepreneurship and
 Sustainability Management*

I am honored to welcome you to the 4th Bomet University Annual International Conference and 2nd Open Day & Innovation Competition, centered around the theme "**Research, Innovation, and Outreach: Commercialization for Sustainability.**" As the University College lives its Niche "Green Economy for Sustainability," the Conference, Open Day and Innovation Competition serve as a catalyst for stakeholders, Researchers and the Community to unit in fostering resilience within Academic, Learning, and Scientific Research, laying the groundwork for Sustainable Development.

Recent research underscores the critical role of support, community, leadership, and planning in both building and hindering capacity for green solutions in research, innovation and outreach. Focus on 'high-impact' greening incentives can address various barriers to capacity-building for research, innovation and outreach. While advancement in technology significant opportunities for capacity-building for green solutions in these areas, we must not overlook the importance of human interactions in the process. Thus, the imperative for research into institutional capacity in offering green solutions for sustainable growth becomes apparent.

In line with its Green Economy Niche, BUC incorporates sustainable practices into its infrastructure, utilizing natural resources like solar energy, natural lighting and rainwater harvested. The University College prioritizes green built designs (such as spacious corridors for natural ventilation/aeration), and has established critical facilities such as the Research Centre and Start-Up Village to expand space for Teaching and Research, all geared towards achieving sustainable operations.

Further, BUC actively contributes to environmental conservation by planting tree and growing towards restoration of forest cover aligned to national and global greening initiatives. This noble greening activity has led to successful engagement



with stakeholders.

Your participation in this conference underscores your commitment to *“Research, Innovation, and Outreach: Commercialization for Sustainability.”* It is our hope that by the conclusion of this Conference, we will have collectively advanced our understanding and practices in fostering resilience within academic (teaching and learning), scientific research, innovation and outreach for Sustainable Development.

Thank you.

CHIEF GUEST



HON. JULIUS MIGOS OGAMBA, EGH CABINET SECRETARY, MINISTRY OF EDUCATION

Hon. Julius Migos Ogamba, is an advocate of the High Court of Kenya, who was before his appointment serving as the Chairperson of the Board of Directors of Kenya Electricity Generating Company PLC (KenGen), and Senior Partner at Migos-Ogamba and Waudo

Advocate. Hon. Ogamba is a seasoned, visionary and accomplished legal practitioner of over 30 years' experience. He is a driven advocate with a proven track record of leading teams, forging long-lasting client relationships and influencing organizational productivity by ensuring compliance with legal and regulatory requirements. Hon. Ogamba holds a Bachelor of Laws degree from the University of Nairobi, a postgraduate Diploma in Law from the Kenya School of Law, and a Diploma in Law from the Institute of Advanced Legal Studies, University of London. His professional affiliations include memberships in the Law Society of Kenya and the Institute of Certified Secretaries of Kenya. He has undertaken training on board leadership, corporate governance for directors, board mastery programme, and political leadership development programme



HON. DR. BEATRICE MUGANDA INYANGALA PRINCIPAL SECRETARY HIGHER EDUCATION AND RESEARCH

Dr. Beatrice Muganda Inyangala is currently the Principal Secretary, State Department for University Education and Research in the Ministry of Education. Dr. Inyangala is an established economist. She holds a B.Ed and M. Phil in Planning and Economics of Education from Moi University and a PhD from the University of Athens, Greece which she acquired at age 33.



After acquiring the doctorate, Dr. Inyangala taught at Moi and Masinde Muliro universities. Dr Inyangala has served as the Director of Higher Education and Deputy Executive Director of Nairobi-based Partnership for African Social and Governance Research. Her areas of expertise are in public policy, gender inclusivity, quality assurance, teaching methodology, governance and fundraising. She has been on the forefront championing education reforms and demanding equality for women. She played a key role in developing vision 2030 (Education and Training strategy) and served as a regulator with the Commission of University Education.



PROF. HILLARY BARCHOK
GOVERNOR, BOMET COUNTY

Prof. Hillary Kipng'eno Barchok is the current Governor of Bomet County. He started his academic journey in Kapkilomwa Primary School in 1981 before proceeding to Kericho High School for secondary school education. He holds a Bachelor of Education

(Science) degree from Egerton University, Njoro and a Master of Education (Science Education) from the same institution. Prof. Barchok is also an alumnus of Moi University where he obtained a Doctor of Philosophy (PhD) degree in Curriculum Development. He has several years' experience in academia having worked as a lecturer in Chuka University where he taught and supervised students in different fields of education. He is a curriculum development specialist who before joining politics, was serving as the dean of Faculty of Education and Resource Development (FERD) between 2012 and 2017. Before joining Chuka University as a lecturer, Prof. Barchok taught Chemistry and Mathematics in various secondary schools as a Teachers Service Commission (TSC) teacher.





PROF. ANDALA BIO

Prof Dickson Andala is the Chief Executive Officer of the National Research Fund (NRF). He undertook a postdoctoral fellowship at Pennsylvania State University in 2011. Dr Andala is involved in policy development and capacity building in nanotechnology. He chaired the Committee on establishment of nanotechnology in Kenya and is a stakeholder in the 'Development of National Research Agenda: Role of Science, Research and Innovation in stimulating Economic growth (i.e. Vision 2030)' spearheaded by National Commission for Science Innovation and Technology. He is the Editor in Chief for the Kenya Chemical Society. He was also involved in setting up the Pan-African Centre of Excellence in Nanomedicine. He is involved in promotion of Chemical Safety and Security in Kenya and the drafting of the Global Chemists' Code of Ethics (GCCE) spearheaded by American Chemical Society in partnership with OPCW. He is currently supervising 8 PhD students and several masters students and has 14 publications in peer reviewed journals and two books. He has organised, given talks and attended several local and international conferences on nanotechnology and materials science. His research interests include the development of metal nanoparticles, metal and metal oxide nanofibers and nanotubes. He is currently a member of Kenya Academy of Sciences; American Chemical Society, Kenya Chemical Society, Royal Society of Chemistry, African Materials Research Society, ANSOLE and Materials Research Society and an IUPAC-Affiliate.

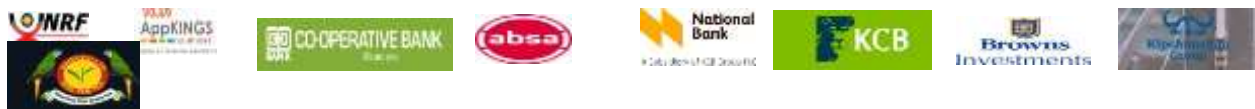


EVENT COMMITTEE

| | |
|---------------------------|-------------------------|
| 1. Dr. Wambongo Recha | Chairperson |
| 2. Dr. David Melly | Member |
| 3. Dr. Waweri Muriithi | Member |
| 4. Dr. Richard Rotich | Member |
| 5. Dr. Nelly Mutai | Member |
| 6. Dr. Florence Anyonje | Member |
| 7. Dr. Fredrick Wafula | Member |
| 8. Ms. Caroline Onywany | Member |
| 9. Ms. Winnie Chengetich | Member |
| 10. Mr. Jackson Cheruiyot | Member |
| 11. Mr. Elisha Kirui | Member |
| 12. Dr. Eliud Wafula | Member |
| 13. Mr. Mathew Ngeno | Member |
| 14. Mr. Enock Kimutai | Member |
| 15. Ms. Joyce Tirop | Member |
| 16. Ms. Josephine Agadah | Member |
| 17. Angela Sionik | Member |
| 18. Dr. Johnmark Obura | Incharge of Secretariat |
| 19. Dr. Teclah Tuwei | Secretariat |
| 20. Mr. Benard Mutai | Secretariat |
| 21. Wycliff Ondieki | Secretariat |

CONFERENCE PAPER PRESENTATION SCHEDULE**BUSINESS**

| S/NO | TIME | TITLE | AUTHOR |
|------|--------------|--|---|
| 1 | 9.00-9.15 am | Relationship between Attitude and Whistle blowing Intentions among Employees in Public Universities in Kenya | Dr. Teclah Tuwei- Bomet University College Dr. Meshack Katam- University of Kabianga |
| 2 | 9.15-9.30 am | Technological Risk and Financial Performance of Commercial Banks in Kenya | Dr. Teclah Tuwei- Bomet University College Dr. Meshack Katam- University of Kabianga |
| 3 | 9.30-9.45 am | Analysis of Social Media Applications in Learning Enhancement and Information Resource Utilization: A | Chepngetich Winnie Bomet University College, |



| | | | |
|-------------------------------|-----------------|--|--|
| | | Case Study of Bomet University College | |
| 4 | 9.45-10.00 am | Harnessing Mobile Technology for Sustainable Funding of Green Energy Solutions: A Pathway to Financial Inclusion and Environmental Impact | Zachary Bosire Omariba & Sarah Kemunto Mogaka Egerton University |
| 5 | 10.00-10.15 am | The Role of Control Activities in achieving Internal Control and Financial Accountability of Government Parastatals. A Case of Kenya Medical Supplies Authority. | Kirui Kimutai Victor & Johnmark Obura. Bomet University College |
| 6 | 10.15-10.30 am | The role of individual responses as a stress response on Employee Performance, Ministry of Finance Nairobi Kenya. | Biwott, Geoffrey Bomet University College |
| 10.30-11.00 AM: PANEL SESSION | | | |
| 7 | 11.00-11.15 am | University-industry linkages for sustainable development. | Beatrice Cheptoo Korir University of Kabianga, Kenya |
| 8 | 11.15-11.30 am | The Role of Flexible Work Schedules and Organizational Culture in Enhancing Employee Performance In Non-Governmental Organizations In Kenya | Emily Omolo Otunga Maseno University |
| 9 | 11.30-11.45 am | Moderating Effect of Quality Management System on the Relationship between Inbound Logistic Strategies and Sustainable Procurement Performance among Kenya Tea Development Agency Factories in Kenya | Joyce Cheruto Rotich, Dr. Pauline Keitany, Dr. Penina Langat University of Kabianga |
| 10 | 11.45-12.00 pm | Translating Research into Sustainable Solutions: The Role of Innovation and Outreach in Commercialization | Dr. Collins Otieno ODOYO Masinde Muliro University of Science and Technology |
| 11 | 12.00- 12.15 pm | Innovation of E-recruitment and it's influence on Employee Performance in Public Service Commission, Kenya | Lily Kitur Moi University |



| | | | |
|---------------|----------------|---|--|
| 12 | 12.15-12.30 pm | From Lab to Market: Driving Sustainability through Research Commercialization | Dr. Tecla Sum, and Dr. Collins ODOYO Masinde Muliro University of Science and Technology |
| 12.30-1.00 pm | | PANEL SESSION | |
| 1.00-2.00 PM | | LUNCH BREAK | |
| 2.00 PM | | KEYNOTE ADDRESS IN MPH | |

ARTS AND SOCIAL SCIENCES

| S/NO | TIME | TITLE | AUTHOR |
|----------------|----------------|---|---|
| 1 | 9.00-9.15 am | Spatial variation in technologies for strategic minerals and climate change mitigation: A review | Charles W. Recha Bomet University College |
| 2 | 9.15-9.30 am | Constraints and Missed Opportunities for Rural Women Participation in Sustainable Food Security in Kenya | Dr. Anthony Waiganjo & Dr Lucy Ngundo Bomet University College |
| 3 | 9.30-9.45 am | Assessment of Wind Energy Potential in Nyandarua County, Kenya: A case study of Kinangop Wind Park: | Muriithi D.I. Murang'a University of Technology |
| 4 | 9.45-10.00 am | Perceived Influence of User-Household Characteristics and Governance Factors on Environmental Sustainability of Community-Managed Borehole Water Kiosks in Kisumu County, Kenya | Jacktone Akelo, PhD |
| 5 | 10.00-10.15 am | Climate Change and Immovable Cultural Heritage in Kenya: Impact and Response Strategies | Angelah Chemeli, Joseph M. Njoroge & Peace B. Agufana |
| 6 | 10.15-10.30 am | Enhancing Energy Reliability at Bomet University: A Sustainable Approach to Mitigating Power Outages | Gibyegon Rotich Hillary, Dr. Geoffrey Biwott & Dr. Clement Nkaabu Bomet University College |
| 10.30-11.00 am | | PANEL DISCUSSION | |



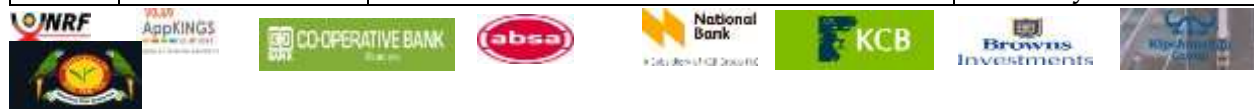
| | | | |
|----------------|----------------|---|--|
| 7 | 11.00-11.15 am | Is climate change affecting sustainable maize production? Insights from Kenya | Vincent Ngeno Moi University |
| 8 | 11.15-11.30 am | Assess Gender Capacity Building Initiatives towards Kenya's External Trade Policy Development Along Kenya Busia Border | 1 Kiptum, J.J., ¹ Rev. Dr. Odhiambo ² , E.O.S. & Dr. Ungaya, C.G. ¹ ¹ Kisii University, ² Bomet University College, |
| 9 | 11.30-11.45 am | Impact of Electronic Cargo Tracking Systems on Cargo Security: A Case of the Inland Container Depot at Embakasi, Nairobi, Kenya | Roy Ochieng' Otieno ¹ Rev. Dr. Elijah O.S. Odhiambo ² ¹ Mount Kenya University, ² Bomet University College, Kenya |
| 10 | 11.45-12.00 am | Tafsiri kwa Udumishaji wa Utamaduni | Hellen Ngetich, Mhadhiri wa muda maalumu, Chuo Kikuu cha Bomet na Mzamifu, Chuo Kikuu cha Kabianga. |
| 11 | 12.00-12.15 pm | Athari za Teknolojia ya Akili Mnemba (AI) Katika Ufunzaji Na Ujifunzaji Wa Lugha Ya Kiswahili. | Dkt. Anyonje Florence Bomet University College |
| 12.15-12.45 pm | | PANEL DISCUSSION | |
| 1.00-2.00 pm | | LUNCH BREAK | |
| 2.00 PM | | KEYNOTE ADDRESS IN MPH | |

PURE AND APPLIED SCIENCES

| S/NO | TIME | TITLE | AUTHOR |
|------|--------------|--|--|
| 1 | 9.00-9.15 am | Controlled Fermentation of African Indigenous Vegetables to Improve Functionality, Lower Postharvest Losses, and Increase Product Safety | Eliud N. Wafula, Paul W. Muyoma, Melanie Huch, Frommherz Lara and Bernhard Trierweiler |



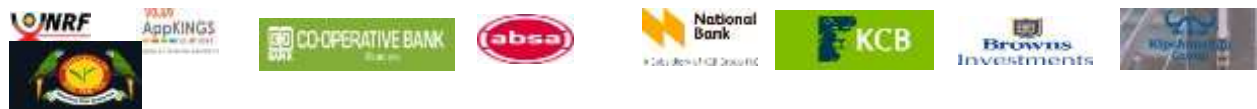
| | | | |
|----------------|----------------|---|---|
| 2 | 9.15-9.30 am | Characterization of Total Petroleum Hydrocarbon (TPH) in Selected Oil-contaminated soils in Greater Port Harcourt Area, Nigeria | WANJALA, M.P.; ODOKUMA, L.; ETELA I |
| 3 | 9.30-9.45 am | A survey of on-farm uses of rice (<i>Oryza sativa</i> L.) by-products in Mwea rice irrigation scheme, Kenya | Gideon Kalii Muli 1* , Alex Machio Kange 2 and John Byalebeka 1 1 Faculty of Agriculture Uganda Martyrs University, Uganda 2 Bomet University College |
| 4 | 9.45-10.00 am | Crude petroleum-oil biodegradation efficiency of <i>Bacillus subtilis</i> and <i>Pseudomonas aeruginosa</i> strains isolated from a petroleum-oil contaminated soil from Ngara East at Nairobi, Kenya | Godfrey O. Mauti *1 , David Keno Kowanga 2 1 Bomet University College, Bomet, Kenya; 2 Maseno University |
| 5 | 10.00-10.15 am | Correlation between C and F Electrons in Heavy Fermion Superconductors | Horace Kibe & Everlyne K Amadi (Bomet University College) |
| 6 | 10.15-10.30 am | Emergence of a reversed backward bifurcation, reversed hysteresis effect, and backward bifurcation phenomenon in a COVID-19 mathematical model | Isaac Mwangi Wangari Bomet University College, |
| 10.30-11.00 am | | PANEL DISCUSSION | |
| 7 | 11.00-11.15 am | Microencapsulation of <i>Lactobacillus plantarum</i> subsp. <i>plantarum</i> CICC 6240 for oral delivery of Bovine Serum Albumin | Sabella Jelimo Kiprono 1, Muhammad Wajid Ullah ⁴ , Zhijun Shi ² , Guang Yang ^{2,3*} 1Masinde Muliro University of Science and Technology, 2,3Huazhong University of Science and Technology, China 4Nanjing forest University, College of Light Industry and Food |



| | | | |
|----|----------------|--|--|
| | | | Engineering |
| 8 | 11.15-11.30 am | Statistical Modeling for Sustainable Economic Growth: Bayesian Approaches in Green Investment Decisions | Dr. Amos Kipkorir Langat, Ph.D. * Dr. David Chepkonga, Ph.D. PAUSTI |
| 9 | 11.30-11.45 am | Title: Phytochemicals in <i>Mondia whitei</i> Confer Fungistatic Activity Against <i>Alternaria solani</i> and <i>Phytophthora infestans</i> and Improves Tomato (<i>Solanum lycopersicum</i>) Performance | Chitui Maurice Email: MMUST |
| 10 | 11.45-12.00 pm | Numerical Analysis of an Inclined Conductor on Magneto Hydrodynamic Convective Flow within a heated wave chamber | Dr. Simeon Maritim and Juma Odhiambo Bomet University College |
| | 12.00-12.30 pm | PANEL DISCUSSION | |
| | 1.00-2.00 PM | LUNCH BREAK | |
| | 2.00 PM | KEY NOTE ADDRESS IN MPH | |

EDUCATION

| S/NO | TIME | TITLE | AUTHOR |
|------|--------------|---|---|
| 1 | 9.00-9.15 am | Influence of Principals' Classroom Supervision Frequency on Teacher Instructional Practices in Public Secondary Schools in Nakuru County, Kenya | Richard Maite Sigilai (PhD) Bomet University College |
| 2 | 9.15-9.30 am | Psychological Influence of Information Technology in the Family: A Review | Dr. Mettoh Jepchirchir Hellen Bomet University College |



| | | | |
|---|----------------|---|---|
| 3 | 9.30-9.45 am | Assessment of Wind Energy Potential in Nyandarua County, Kenya: A case study of Kinangop Wind Park: | Muriithi D.I. Murang'a University of Technology |
| 4 | 9.45-10.00 am | Adverse Childhood Experiences (ACEs) Link to the Mental Health of Young Women | Lucy Wangechi Ngundo & Anthony Gathambiri Waiganjo Bomet University College |
| 5 | 10.00-10.15 am | Adolescence Developmental Milestone in African Context – A Review Paper | Odira, Naomi & Muchemi, Peter Bomet University College |



| | | | |
|----------------|----------------|--|--|
| 6 | 10.15-10.30 am | The Energy Drinks Phenomenon: Patterns of Consumption, Risks and Intervention Strategies amidst Rising Substance Abuse in Kenyan Universities. | Waweru Muriithi Bomet University College |
| 10.30-11.00 am | | PANEL DISCUSSION | |
| 7 | 11.00-11.15 am | Mental Health Disorders Associated with Tiktok Addiction Among University Students: A Case of University of Embu, Kenya | Dr. Lusire Lumumba, PhD The University of Embu, Kenya |
| 8 | 11.15-11.30 am | Effect Assessment of Re-Tooling on Guided Writing Skills in English in Public Junior Schools in Bomet Central Sub-County, Kenya. | Kosgey Kiprono Robert Bomet University College |
| 9 | 11.30-11.45 am | An Assessment of Guidance and Counselling Programmes Equipment Available in Secondary Schools In Bureti Sub-County | Kesui, Hellen C. University of Kabianga Muchemi, Peter Muriithi, Waweru Bomet University College |
| 10 | 11.45-12.00 pm | Relationship Between Physical Child Abuse and Academic Performance among Public Primary School Pupils in Kiambiu Slum, Nairobi | Charles Nyaranga & Elizabeth Kaiyu Musya Africa Nazarene University |
| 11 | 12.00-12.15 am | Public primary school teachers' awareness of the digital content to be integrated in the curriculum; the case of Homa Bay County, Kenya | Ouma Omito Bomet University College |
| | 12.15-12.30 | Teacher Perception of Curriculum Implementation at Junior School Level, Bungoma County, Kenya | Pius Chililia Bomet University College |
| 12.15-12.45 pm | | PANEL DISCUSSION | |
| 1.00-2.00 pm | | LUNCH BREAK | |
| 2.00 pm | | KEYNOTE ADDRESS IN MPH | |



ABSTRACTS

Relationship between Attitude and Whistle blowing Intentions among Employees in Public Universities in Kenya

Dr. Teclah Tuwei- Bomet University College

Dr. Meshack Katam- University of Kabianga

Whistle blowing is essential to organizations as it helps to expose misbehavior which if left, may degenerate to unethical actions that may bring disrepute to the organization or lead to loss of property. Even though whistle blowing in Kenyan public universities is rare, some surveys have illustrated instances of whistle blowing from both members of the public and administrators. The purpose of this study was to determine the relationship between attitudes and whistle blowing intentions among employees in public universities in Kenya. The study was anchored on the theory of planned behaviour. The study adopted a positivist research philosophy and correlational research design and utilized questionnaires as the main tool in collecting primary data. A coefficient of 0.85 was obtained using the Cronbach Alpha which showed internal consistency. Descriptive statistics were obtained using frequencies and percentages. Multivariate linear regression was used to determine the factors that were associated with whistle blowing intentions among employees in public Universities in Kenya. The target population was 30,818 employees from public university in Kenya. A sample size of 395 respondents was obtained using Yamane formulae. Proportionate sampling was used to obtain the number of respondents in each university and simple random sampling was used to select respondents to fill the questionnaires. Descriptive statistics were analyzed in form of Mean and Standard deviation while multiple linear regression model and correlation analysis were used to establish the relationships of the study constructs. The relationship between attitude and whistle blowing intentions was significant. One unit increase in attitude led to an increase in whistle blowing intentions by 0.12 ($R^2 = 0.21$, $\beta = 0.12$, $p\text{-value} = 0.024$). The study findings revealed that gender, altruism, ethical values and attitude all have positive and significant relationships with whistle blowing intentions and organizational support moderates the relationship. The study recommends that universities should continuously sensitize employees on whistle blowing so as to promote the culture of whistle blowing.

KEYWORDS: *Attitude, Whistle blowing Intentions, Universities, Employees, academic institutions, higher education.*



Technological Risk and Financial Performance of Commercial Banks in Kenya

Dr. Teclah Tuwei- Bomet University College

Dr. Meshack Katam- University of Kabianga

Commercial banks are a key player in the financial industry and impact greatly on any nation's economy. Banks operate in a very risky environment and their performance is of great interest to all stakeholders not just the shareholders. Technology is now referred as a necessary evil and a great business enabler. The aim of this research was to establish the relationship between technological risk and financial performance of commercial banks in Kenya. The study used number of branches, ATMs and Agents as key indicators for independent variable while ROE and ROA were used for dependent variable. The study was anchored on diffusion of innovation theory. The study population was the forty - two (42) commercial banks in Kenya. Purposive sampling was used to pick 32 commercial banks. Data was analyzed using R statistical software version 4.3.2. Linear mixed effects multiple regression allowing random effects to vary by banks was used. The study results showed that for ROE, (beta: 0.11,95% CI; p-value: 0.003) an increase in the total number of branches is associated with a positive effect. The number of ATMs and agents ranged from 0 to over 500. From the mixed effects regression model, a larger branch network contributes significantly to higher ROE (beta: 0.15; 95%CI:(0.06 – 0.24); p-value: 0.001). The study concluded that there is a statistically significant relationship between technological risk and the financial performance of commercial banks in Kenya. The study recommends that banks adopt and utilize technological innovations to become more efficient in serving a larger population of customers. The study findings may be beneficial to government and its agencies, commercial banks managers, technological experts and scholars alike in policy formulation and development of required technological software and hardware and advancement of knowledge and more research towards addressing technological risk and maximizing financial performance.

Key words: Technological Risk, Risk Management, Financial Performance, Commercial Banks, Technology

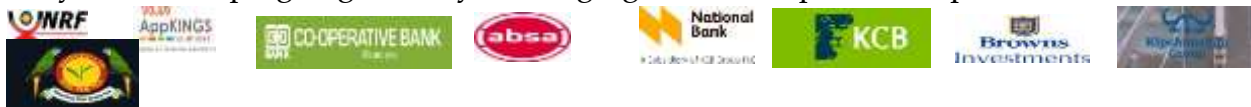
Harnessing Mobile Technology for Sustainable Funding of Green Energy Solutions: A Pathway to Financial Inclusion and Environmental Impact

¹Zachary Bosire Omariba & ¹Sarah Kemunto Mogaka

¹Egerton University

*Correspondence: zomariba@egerton.ac.ke

Sustainable green solutions require accessible, transparent, and efficient funding mechanisms to support research, innovation, and commercialization. Mobile payment systems, such as mobile banking and digital wallets, offer a simple yet transformative approach to address this need, particularly in developing regions. By leveraging the widespread adoption of mobile technology,



these systems reduce transaction costs, enhance financial inclusion, and enable real-time tracking of funds, thereby promoting accountability and efficiency in green financing. This study explores the role of mobile payment platforms in facilitating crowdfunding and micro-donations for environmental projects, such as renewable energy, waste management, and reforestation initiatives. It highlights successful case studies where mobile payments have driven funding accessibility and community engagement for green solutions. Additionally, the paper addresses challenges such as security concerns, digital literacy gaps, and infrastructure limitations, while proposing strategies to integrate mobile financial solutions into sustainable development programs. The findings underscore the potential of mobile payment systems to democratize access to green funding, foster transparency, and accelerate the transition toward environmentally sustainable practices. This research contributes to the growing discourse on the role of ICT in driving financial sustainability for green initiatives, offering practical insights for policymakers, financial institutions, and environmental organizations.

Keywords: *Mobile Payment Systems, Green Funding, Financial Inclusion, Crowd-funding, Sustainable Development, ICT for Sustainability*

The role of individual responses as a stress response on Employee Performance, Ministry of Finance Nairobi Kenya.

Biwott, Geoffrey

School of Business and Economics

Individual responses are the foundation of a variety of performance in people. The person is a crucial element of organizational behavior, whether acting alone or in a group, in response to organizational expectations or in response to external influences. Therefore, the study's goal is to close this gap by addressing one of its specific aims, which is to determine the effect of individual responses on employee performance in the pensions department. The transactional theory served as the theoretical foundation for the investigation. In order to make assumptions about the links between the variables, the study used an explanatory research design. The 2000 workers of the Kenyan Ministry of Finance Pension Department made up the target population with a sample of 322. Both descriptive and inferential statistics were utilized to evaluate the data, and linear regression was employed to test hypotheses. The sample of respondents was drawn at random from the target demographic of employees using a simple random sampling procedure. To gather data, questionnaires were employed. It was determined that there is no connection between Job Demands and Role Overload on Employee Performance. This null hypothesis was rejected. A structured questionnaire was used to collect the data, and descriptive and inferential statistics were used to analyze the results. An equation for multiple regression was developed in order to examine the effects of the hypothesized factors. Results revealed that individual responses ($\beta_5 = 0.118, p = 0.007 < 0.05$) had significant and positive effect on employee performance of pensions department, ministry of finance. The study came to the



conclusion that effective management of individual responses of employees was essential to their performance.

Keywords: Employee Performance, Individual Responses, Kenya, Pensions Department.

Relationship between Attitude and Whistle blowing Intentions among Employees in Public Universities in Kenya

Dr. Meshack Kipkoech Katam (PhD)

University of Kabianga,

Dr. Teclah Tuwei

Bomet University College

Whistle blowing is essential to organizations as it helps to expose misbehavior which if left, may degenerate to unethical actions that may bring disrepute to the organization or lead to loss of property. Even though whistle blowing in Kenyan public universities is rare, some surveys have illustrated instances of whistle blowing from both members of the public and administrators. The purpose of this study was to determine the relationship between attitudes and whistle blowing intentions among employees in public universities in Kenya.

The study was anchored on the theory of planned behaviour. The study adopted a positivist research philosophy and correlational research design and utilized questionnaires as the main tool in collecting primary data. A coefficient of 0.85 was obtained using the Cronbach Alpha which showed internal consistency. Descriptive statistics were obtained using frequencies and percentages. Multivariate linear regression was used to determine the factors that were associated with whistle blowing intentions among employees in public Universities in Kenya. The target population was 30,818 employees from public university in Kenya. A sample size of 395 respondents was obtained using Yamane formulae. Proportionate sampling was used to obtain the number of respondents in each university and simple random sampling was used to select respondents to fill the questionnaires. Descriptive statistics were analyzed in form of Mean and Standard deviation while multiple linear regression model and correlation analysis were used to establish the relationships of the study constructs. The relationship between attitude and whistle blowing intentions was significant. One unit increase in attitude led to an increase in whistle blowing intentions by 0.12 ($R^2 = 0.21$, $\beta = 0.12$, p -value = 0.024). The study findings revealed that gender, altruism, ethical values and attitude all have positive and significant relationships with whistle blowing intentions and organizational support moderates the relationship. The study recommends that universities should continuously sensitize employees on whistle blowing so as to promote the culture of whistle blowing.

KEYWORDS: Attitude, Whistle blowing Intentions, Universities, Employees, academic institutions, higher education.



Enhancing Energy Reliability at Bomet University: A Sustainable Approach to Mitigating Power Outages

Gibyegon Rotich Hillary, Dr. Geoffrey Biwott & Dr. Clement Nkaabu

Bomet University College (Constituent College of Moi university)

Bomet University heavily relies on the national grid for electricity supply, with partial solar backup covering limited sections of the campus. However, during power outages, critical infrastructure such as ICT machines, administration computers, printers,

CCTV systems, and other essential electrical loads remain unsupported. This results in significant disruptions to revenue systems, administrative operations, virtual conferences, research activities, and essential learning tools. Addressing these challenges requires sustainable and innovative energy solutions, including upgrading the existing solar power system, implementing battery storage, and zoning critical areas such as ICT hubs, security lighting, laboratories, executive offices, and administration blocks for prioritized backup power.

Case studies from institutions such as Strathmore University in Kenya, which installed a 10kWp carport solar system, and Maharishi International University in the United States, which adopted a 1.1MW solar power plant with battery storage, demonstrate the viability and benefits of solar-backed energy solutions in academic settings. By adopting a similar approach, Bomet University can enhance energy reliability, reduce operational disruptions, and ensure a sustainable power supply for critical functions. This paper explores feasible strategies for implementing a robust solar energy and battery storage system to create a resilient and sustainable power infrastructure for the university.

Innovation of E-recruitment and it's influence on Employee Performance in Public Service Commission, Kenya

Author: Lily Kitur

Email: lilykitur1@gmail.com

Affiliation: Moi University

This study sought to establish the influence of e-recruitment on employee performance in public service commission, Kenya. The study was anchored on the Unified Theory of Acceptance and Use of Technology, and employed an explanatory research design. The target population was 363 employees working in the Public Service Commission. The stratified simple random sampling was used to select 184 employees using Yamane formula. Data was collected using questionnaires. Quantitative data was analysed using linear regression analysis. The results indicated that E-recruitment has a positive significant influence on employee performance in public service commission, Kenya ($\beta = 0.908$; $p < 0.05$). The study concluded that e-recruitment had a positive and significant influence on employee performance in Public Service Commission in Kenya. The use of e-recruitment ensures better applicant tracking during the hiring process to find the right candidate for the job descriptions, and that e-recruitment greatly increases the effectiveness of hiring decisions made by human resource management. This study recommends that the management of the Public Service Commission should



optimize use of the online recruitment for fairness and objectivity in the entire process, enhance transparency, enhance turn-around time and also enhance brand image.

Key words: *E-recruitment, Employee, Performance, Public Service Commission*

From Lab to Market: Driving Sustainability through Research Commercialization

Dr. Tecla Sum, and

Dr. Collins ODOYO

Masinde Muliro University of Science and Technology

This paper explores the critical role of research commercialization in achieving sustainable development goals. Academic research generates valuable innovations yet translating these discoveries into market-ready products and services remains a significant challenge. This study therefore investigates the pathways through which research innovations can be effectively commercialized to drive sustainable outcomes, focusing on the linkage that exist between technological advancements, market demands, and societal needs. Case studies of successful research commercialization initiatives that have demonstrably contributed to environmental, social, and economic sustainability have been done. The paper examines the key factors influencing successful commercialization, which include intellectual property management, funding strategies, industry partnerships, and entrepreneurial ecosystems. Further, the paper addresses the inherent challenges in scaling sustainable innovations, such as regulatory hurdles, market acceptance, and the need for robust life-cycle assessments. The findings highlight the importance of adopting a holistic approach that integrates sustainability considerations throughout the entire commercialization process, from early-stage research to market deployment. By fostering a collaborative environment and implementing strategic frameworks, research institutions and industries can effectively bridge the gap between lab discoveries and market solutions, thereby driving tangible progress towards a more sustainable future.

Translating Research into Sustainable Solutions: The Role of Innovation and Outreach in Commercialization

Dr. Collins Otieno ODOYO

Masinde Muliro University of Science and Technology

Email: codoyo@mmust.ac.ke

This paper looks at the critical interconnection that exists between research innovation, outreach activities, and commercialization in in search for sustainable solutions. Research generates valuable knowledge and technological advancements, but its impact is contingent upon effective translation into market-ready products and services. Therefore this study examines how strategic innovation and targeted outreach can bridge the gap between scientific discovery and practical application, fostering commercialization pathways that prioritize environmental, social, and economic sustainability.



Literature was reviewed from diverse sectors, highlighting successful models that integrate innovation strategies with robust outreach programs to engage stakeholders, build partnerships, and ensure the responsible deployment of sustainable technologies. The findings underscore the importance of fostering a collaborative ecosystem where research, industry, and communities converge to drive sustainable commercialization. By emphasizing the role of outreach in disseminating knowledge, building trust, and facilitating knowledge transfer, this paper demonstrates how research innovations can be effectively channeled towards creating lasting, positive impact and contributing to a more sustainable future.

The Role of Control Activities in Achieving Internal Control and Financial Accountability of Government Parastatals. A Case of Kenya Medical Supplies Authority.

Kirui Kimutai Victor, Obura Johnmark and Nelly Mutai

Bomet University College

The study aimed to investigate the role of control activities in achieving effective internal control and financial accountability. The study was conducted based on a literature review of publications and reports related to the topic. The study applied a qualitative research approach, and the research design was descriptive. The study found that properly designed control activities are necessary for corporate governance and internal control efficiency. The KEMSA case demonstrates how weak control activities such as authorization, verification, reconciliation, analysis, work performance, maintaining the security of company assets, and segregation of functions and ethics lead to internal control and financial accountability inefficiency. The study recommends the implementation of the COSO framework of internal control to achieve internal control efficiency and financial accountability in state parastatals.

Constraints and Missed Opportunities for Rural Women Participation in Sustainable Food Security in Kenya

Anthony Waiganjo and Lucy Ngundo

Bomet University College

In Kenya, where most of the population is either transitorily or chronically food insecure. The women are the worst affected by this insecurity among the rural communities. In these communities, rural women are significantly involved in production, distribution and utilization of food which are the key components of the food chain. Although rural men play pivotal role in enhancing food security, they encounter minimal constraints compared to women. Their involvement is hampered by the underlying multiple factors that works simultaneously to cause women oppression. These include gender, ethnicity, age, race, ableism, socio-political, cultural and economic status. Most importantly, they are often not involved in policy spaces where deliberations on food security are made. Similarly, effects of climate change affects rural women most by



frustrating their food production process. This work is designed to assess the constraints that rural women face in food production amidst ever changing climatic conditions. The work shall adopt a feminist approach in highlighting their challenges in food production amidst climate change. In that respect, feminist intersectionality theory is used to demonstrate how multiple intersecting factors hinder rural women from engaging fully in food production. This study adopts a qualitative phenomenological design method whereby primary data shall be analyzed and corroborated with already existing empirical evidence.

Key Words: Climate change, Constraints, Feminist Intersectionality, Food security, Kenya, Rural women

Athari za Teknolojia ya Akili Mnemba (AI) Katika Ufunzaji Na Ujifunzaji wa Lugha ya Kiswahili. Anyonje Florence, Simon Kirui & Mosoin Joseah

Teknolojia za kisasa na hasa Akili Mnemba (Artificial Intelligence - AI) zina jukumu kubwa katika kuboresha mchakato wa kufunza na kujifunza lugha. Lugha ni zana muhimu katika mawasiliano kwa sababu huchangia katika maendeleo ya kibinafsi, kijamii na kiuchumi. Lugha hutumiwa katika utafiti, uvumbuzi na usambazaji wa matokeo ya tafiti nyingi. Miktadha na mbinu mbalimbali zinaweza kutumiwa kufunza lugha kama vile darasani, mtagusano na jamii, kujisomea na matumizi ya teknolojia na hasa zile za kisasa kama Akili Mnemba (AI). Tafiti tofauti zimefanywa kuhusu matumizi ya teknolojia katika sekta ya elimu na matokeo ya tafiti hizi yamekuwa msingi wa mabadiliko katika mbinu za kufundishia. Akili mnemba imeanza kuchukua nafasi kama mojawapo ya mbinu za kufundishia lugha. Akili mnemba ni nadharia ya uundaji wa mifumo ya kompyuta yenye uwezo wa kutekeleza kazi ambazo kawaida zinahitaji akili ya binadamu kama vile kuona, kutambua sauti, kufanya maamuzi au kutafsiri lugha. Utafiti huu unalenga kuchunguza athari za matumizi ya Akili Mnemba katika muktadha wa elimu na hasa ufunzaji na ujifunzaji wa lugha ya Kiswahili ikichukuliwa kuwa lugha hii ni muhimu katika mawasiliano na imeanza kuchukua nafasi kuu katika mawasiliano kote duniani. Swali hapa ni, Je, hizi programu ambazo zinatumiwa katika Akili Mnemba zina athari zipi katika ufunzaji na ujifunzaji wa lugha ya Kiswahili. Utafiti utajikita katika athari chanya na hasi ikiwa teknolojia hii itatumiwa katika ufunzaji wa lugha ya Kiswahili. Inatarajiwa kuwa matokeo ya utafiti huu itatoa msingi mahsusi katika mipangilio ya ufunzaji na ujifunzaji wa lugha ya Kiswahili.

Istilahi muhimu: Akili mnemba, Teknolojia

Key Words: Climate change, Constraints, Feminist Intersectionality, Food security, Kenya, Rural women



Analysis of Social Media Applications in Learning Enhancement and Information Resource Utilization: A Case Study of Bomet University College

Chepngetich Winnie¹ Bomet University College, P.O Box 701-20400, Bomet, Kenya.

Email: winniemutai09@gmail.com

This study aimed to examine the effectiveness of social media applications in enhancing learning and information resource utilization at Bomet University College. The integration of social media in higher education has become increasingly significant as institutions seek innovative ways to facilitate knowledge sharing and collaborative learning in the digital age. Through a case-study survey design, the research collected data from 199 undergraduate students in the Schools of Education, Pure and Applied Sciences, selected through simple random sampling. The findings revealed that students predominantly use social media several times per week, with 20.5% accessing local community events and 16.5% utilizing service updates. While 63% of respondents trust social media for knowledge sharing, the study identified significant challenges. The study concludes that while social media holds considerable potential as an educational tool, institutions must address infrastructure limitations, privacy concerns, and cybersecurity challenges to effectively integrate these platforms into higher education settings.

Keywords: social media, Knowledge Sharing, Learning, Education

Assessment of Wind Energy Potential in Nyandarua County, Kenya: A case study of Kinangop Wind Park:

Muriithi D.I.

Murang'a University of Technology

Email: davidikua44@gmail.com, +254 723 871 745

The transition to renewable energy sources is critical for achieving sustainable development and reducing greenhouse gas emissions. This study assesses the wind energy potential of Nyandarua County, Kenya, with a focus on the Kinangop Wind Park. Despite its strategic location and substantial wind resources, the Kinangop Wind Park project faced numerous challenges, including technical, economic, and social barriers, which ultimately led to its discontinuation. Through a combination of geospatial analysis, wind resource modelling, and stakeholder interviews, this research evaluates the region's wind energy potential and identifies lessons from the Kinangop experience. Key findings indicate that Nyandarua County possesses high wind energy potential, with average wind speeds exceeding 7 m/s in several areas, making it suitable for utility-scale wind power generation. However, the study highlights the critical importance of addressing community engagement, land use conflicts, and policy support in project planning and implementation. The research underscores the need for adaptive approaches to renewable energy development that integrate technical feasibility with socio-economic considerations.



This case study adds to the existing knowledge of the lessons learned about renewable energy deployment in sub-Saharan Africa and provides practical recommendations on how to address the challenges faced in the wind energy development in Nyandarua County and other similar settings.

Keywords: Wind Energy Potential, Renewable Energy, Kinangop Wind Park, Nyandarua County

Spatial variation in technologies for strategic minerals and climate change mitigation: A review

Charles W. Recha^{1*}

¹*Bomet University College, Department of Geography, Environment and Development Studies, P.O Box 701 – 20400, Bomet, Kenya*

Exploitation of natural resources form part of geopolitics and economic development for states. Resource exploitation has necessitated development of innovations and technologies which unfortunately has retrogressively affected the quality of environment and human life. This has led to a call for a shift towards green economic development and focus on critical or strategic minerals. This study undertakes a review of on spatial variation in technologies for critical minerals and climate change mitigation. It is established that distribution of strategic minerals has a horizontal standpoint. That is, they are found in core (Australia, USA) semi-periphery (China, Brazil, Russia, Argentina, South Africa) and periphery (Chile, Democratic Republic of Congo, Gabon, Zambia, Madagascar, Mozambique, etc) states. However, the demand and technologies for strategic mineral are concentrated in a few core countries (such as Japan, South Korea, USA, Germany). Countries with the largest number of climate change mitigation technologies (CCMT)-related patents are Japan (46,529), the US (31,972), Germany (22,967), South Korea (12,639) and France (6077). The highest rise in the number of CCMT patents was experienced in 2010 in the areas of energy generation & transmission and transportation. The leading Multi-National Companies (MNC) with CCMT patents are Siemens AG (6913), Toyota Motor Corporation (6563), General Electric Company (6398), Baytheon Technologies Corporation (4911) and Panasonic Holdings Corporation (4850). It is noteworthy that MNCs posse extensive knowledge pertaining to innovative technologies owing to their substantial investment in research & development. To mitigate the imbalance (in trade for strategic minerals), producing and consumer (also importing) countries are forging partnerships to refine and process from the former. Such partnerships will reduce cost, benefit the green economy processes and ensure a reliable, diversified supply of green technology products. On CCMT, developing countries should leverage on knowledge generated by MNCs (or their subsidiaries) through networks and re-orient policies towards CCMT.

Key Words: *Strategic minerals, climate change mitigation technologies.*

Number of Words: 300



Climate Change and Immovable Cultural Heritage in Kenya: Impact and Response Strategies

Angelah Chemeli, Joseph M. Njoroge & Peace B. Agufana

Immovable cultural heritages represent past human life that links the past, present, and future landscapes. Protection and preservation of authenticity and integrity of these built heritages is a major challenge in the twenty-first century. Increased number of extreme weather events associated with climate change is a major concern in management and conservation of cultural heritage around the globe. This study assessed climate change impacts on immovable cultural heritage and the response strategies being employed along Kenya's coastline. Two counties in the coast region (Mombasa and Kilifi) were chosen for the study because of their rich cultural heritage surrounded by natural hazard-prone environment which has seen some of the sites listed to be in danger due to climate change. Through engagement with practitioners responsible for management of the sites, the following elements were looked into: sea level rise, coastal flooding, temperature rise, coastal winds, coastal erosion, increased precipitation, and increase in acidity levels. Data was collected through observation, interviews, and administering of questionnaires in the eight immovable cultural heritage sites in Mombasa and Kilifi counties. Findings indicate that the immovable cultural heritage sites are greatly affected by the climatic changes. Presence and growth of plants, corroded metallic parts, cracks, fallen walls, rotten wooden parts, submerged structures, and flaked walls have been exacerbated by extreme weather-related events. Furthermore, despite climate changes being a major threat to these sites, it has not been included in cultural management plans. Inadequate resources are the main barrier in adapting to climate change. Structural and managerial strategies employed in the management of heritage sites in the region are highlighted.

Perceived Influence of User-Household Characteristics and Governance Factors on Environmental Sustainability of Community-Managed Borehole Water Kiosks in Kisumu County, Kenya

Jacktone Akelo, PhDⁱ

jakelo@psfoundation.go.ke

Access to safe drinking water is a global challenge, with approximately one-quarter of the world's population lacking such access. Kenya, like many Sub-Saharan African countries, grapples with water insecurity, leading to the establishment of water kiosks as a solution. However, these borehole water kiosks often face or cause environmental sustainability challenges. This study examined the influence of user household characteristics and governance factors on the environmental sustainability of community-managed borehole water kiosk services in Kisumu County, Kenya. The specific objectives were twofold. The first objective was to analyse the influence of water kiosk household characteristics. The second objective was to assess the influence of governance factors on the environmental sustainability of community-managed water kiosk services. A mixed-methods research design was employed, combining qualitative data from three focus group discussions with 31 water kiosk operators and quantitative data from questionnaires administered to 460 user households. Descriptive statistics and binary logistic regression were used to analyse quantitative data, while thematic analysis



was used to analyse qualitative data. In the first objective, the study findings revealed that user's frequency of earning, purpose for water use, reason for using the particular water source, and duration of water collection from a source had a statistically significant association with the environmental sustainability of community-managed borehole water kiosk services. Other statistical significant influence was revealed for income from self-employment and frequency of drinking water collection. For the second objective, study findings revealed that membership to and payment for membership to the borehole water kiosk, ownership of land on which kiosk was located, and existence and resolution of water use conflicts were revealed to be of statistically significant in association with the environmental sustainability. Results from qualitative analysis triangulated these findings from statistical analysis. For instance, during the focus group discussions, the kiosk operators were equally concerned about the seasonal patterns of fetching water from the borehole water kiosks. Therefore, efficient service delivery, water quality maintenance, and responsiveness to seasonal variations are essential for environmental sustainability. Source of income and ownership of land where the BH kiosk is located play a crucial role in environmental sustainability, while the complexity of ownership beliefs suggests the need for tailored engagement strategies. Finally, land tenure issues should be addressed to enhance environment sustainability. Policymakers and stakeholders should consider these findings to develop strategies that ensure reliable access to safe drinking water in Kenya and similar regions.

ⁱ Executive Chair, Pace Setters Foundation – Nairobi, Kenya

Adverse Childhood Experiences (ACEs) Link to the Mental Health of Young Women

Lucy Wangechi Ngundo & Anthony Gathambiri Waiganjo

Bomet University College

Email: anthonygathambiri@yahoo.com /awaiganjo@buc.ac.ke

Adverse childhood experiences (ACEs) are a global concern, as highlighted by the United Nations 2030 Sustainable Development Goal 16.2, which aims to eradicate all forms of abuse and trauma against children and, therefore, women. Investigating literature evidence of the connection between young women's exposure to ACEs and their later risk of mental health problems was the primary objective of this study. While ACEs and their impact on mental health outcomes have been extensively researched globally, research conducted in African countries, like Kenya, has primarily focused on the prevalence of ACEs or identified specific ACEs to examine their association with specific mental health outcomes. The spectrum of Adverse Childhood Experiences (ACEs) discussed in this study includes emotional neglect, sexual abuse, domestic violence, familial stresses such as divorce or separation, and harmful cultural practices aimed at young women. The study is important because it adds to the understanding of the connection between the mental health of young women and childhood adversity, grounded in light of feminist intersectionality. The diathesis-stress model and additional theoretical models were employed in the investigation. This qualitative, non-empirical



method makes use of cross-sectional surveys, clinical inquiries, and long-term cohort studies. The results of the study brought to light the intersectionality of ACEs and the fact that they don't occur in a vacuum, both of which hurt the mental health of young women. The study promoted the development of support systems as well as the early identification and treatment of ACEs to help young women who are struggling with mental health issues thrive.

Keywords: Adverse Childhood Experiences (ACEs); complexities; mental health; World Health Organization (WHO); young women

Adolescence Developmental Milestone in African Context – A Review Paper

Odira Naomi & Muchemi Peter

Bomet University College

Adolescence is a critical developmental stage marked by significant physical, psychological, and social transitions. Africa's rich and diverse cultures shape the developmental experiences of adolescents in unique ways. Studies indicate that nearly 80% of Africa's population is under 25 years old, making adolescence a crucial phase that demands contextual understanding. Adolescence is a transitional period marked by physical, social, intellectual, and behavioral changes as individuals mature from childhood to adulthood. Given the interplay between cultural traditions and modernization, African societies exhibit varied perspectives on pubertal development and sociocultural expectations. In the African context, adolescent changes are influenced by unique cultural, economic, and environmental factors. This review explores adolescent developmental milestones in the African context, emphasizing physiological, social, and intellectual growth. It highlights the influence of traditional rites of passage, family structures, and contemporary challenges such as urbanization, digital media, and shifting societal norms. Additionally, the review addresses challenges such as early marriage, gender disparities, and limited access to reproductive health services. The paper concludes that while modernization has influenced adolescent experiences, African communities should preserve cultural values that support a healthy and structured transition into adulthood. Integrating indigenous knowledge with modern approaches will foster a balanced and contextually relevant framework for adolescent development in Africa. Further, by integrating cross-disciplinary perspectives, this paper provides insights into how policies and interventions can be tailored to support healthy adolescent development in Africa.

Keywords: Adolescence, Developmental Milestone, African Context



Psychological Influence of Information Technology in the Family: A Review

Dr. Mettoh Jepchirchir Hellen

Bomet University College,

hellenmettoh@gmail.com

Information technology in this study involves any telecommunication that receives, stores, retrieves, studies, transmits, manipulates data, and sends information. The family is the basic unit of society where we have the parents and school-going children, among other family members. Family bonding is paramount to school-going children as it enhances self-esteem and the art of belonging resulting in better academic performance. The study focused on the smartphone which is one of the most revolutionary and innovative devices of the 21st century where users can navigate a variety of materials, and baggage in the tool kit and a means of receiving, storing, retrieving, studying, transmitting, manipulating data, and sending information. This review ascribed to the research domain of phenomenology where interviews were utilized in interrogating the participants' experiences. This was a qualitative approach to analytical investigation where the analysis was based on social learning theory. The study found that when people attain a dependence level concerning the use of their smartphone, it results in an anxiety state when they are not able to use their device due to power issues, misplacement, or when the smartphone is stolen. Over-dependence on smartphone also, especially during moments of crisis like during the COVID-19 pandemic, is associated with increased stress and anxiety among members of the family, especially school-going children. Besides, when the smartphone takes over the family's bonding time, it becomes a source of stress for the affected family members. It can also be distracting and irritating when smartphone users watch videos, play games, listen to music, engage in loud conversations before others, or any other form of noise from smartphones. The study concluded that using the smartphone irresponsibly within the family can be damaging. This study therefore recommended that it is important for family members to use the smartphone in moderation to avoid psychologically damaging relationships within the family or inflicting self-stress when the smartphone use is out of reach. Besides, it is paramount for smartphone users to use headphones and always put their devices in silent mode when they are in the presence of other family members to avoid distracting and causing a psychological nuisance to them.

Keywords: information technology, smartphone, family relationships, school, headphones, damage.

Influence of Principals' Classroom Supervision Frequency on Teacher Instructional Practices in Public Secondary Schools in Nakuru County, Kenya

Richard Maite Sigilai (PhD)

Bomet University College, A Constituent College of Moi University,

E-mail: rmsigilai@gmail.com

The study examined the relationship between the frequency regarding classroom observation by principals and the instructional practice of teachers in public secondary schools in Kenya. The study found out how the varied frequencies of classroom supervision by the leadership of the school, that is, principals, deputy principals, and HODs, could have an effect on both the quality of teaching and the



assimilation of new instructional methods and curriculum standards. Specific research questions focused on the relationship between supervision frequency and improvements in teaching practices. A descriptive survey design under the mixed-methods approach was used in this study, with quantitative data from structured questionnaires and observation checklists and qualitative insights from semi-structured interviews. This study used stratified random sampling to select teachers, principals, and HODs from public secondary schools in Kenya to ensure an equitable mix. The data were analyzed using descriptive and inferential statistics. Results expressed that frequent supervision significantly enhances instructional practices. For instance, 60.5 percent of the principals replied that they frequently ensure that classroom priorities are aligned to school goals while 42.1 percent frequently reviewed student work products during the evaluation. The study recommends school principals to increasingly supervise classrooms both frequently and consistently, including informal visits, in providing timely feedback to teachers. Policymakers at the state and local levels should establish clear guidelines for instructional supervision and provide principals the instruments and training to implement it. Emphasis should also be given to professional development programs on supervisory skills for school leaders. Results from this study could help in understanding, and more so, in resource-constrained educational environments like the present ones, issues on instructional leadership. These findings show that structured and frequent supervision plays a crucial role in enhancing teaching quality. Future research should investigate the long-term effects of these supervisory practices on student outcomes and explore possible benefits of a distributed leadership model for enhanced instructional effectiveness.

Keywords: Class supervision, instructional practices, school leadership, public secondary schools in Kenya.

Relationship between Physical Child Abuse and Academic Performance among Public Primary School Pupils in Kiambiu Slum, Nairobi

Charles Nyaranga & Elizabeth Kaiyu Musya

Africa Nazarene University

Email: drnyaranga@gmail.com Mobile:+254 722950001

Despite the ratification of the United Nations Convention on the Rights of the Child by many countries globally, the incidences of child abuse are on the rise and are currently topic of concern among many stakeholders and little is known about how child abuse affects their academic performance. The study examined the relationship between physical child abuse and academic performance among public primary school pupils in Kiambiu slum , Nairobi. The study used correlational research design. A target population of 1,085 was used in the study where a sample of 187 subjects was selected as the study respondents and which included: students, teachers and head teachers. Stratified sampling, simple random sampling and purposive sampling procedures were applied in sample selection. Questionnaire and interview guide were used for data collection. The split half method was used to assess the reliability of the questionnaire. The questionnaire yielded a



Cronbach's Alpha of 0.79 thus the tool was considered reliable. The researcher used content validity to ensure that the tool collected what it was intended; three experts in the field of research were consulted in order to verify whether the instruments were valid. The collected data was analysed with the help of a Statistical Package for Social Science (SPSS) version 22.0. Analysed data was presented using frequencies and percentages and summarized in tables and figures. Further, the Pearson's correlation was used to test hypothesis. The study findings indicate that there is a moderate negative correlation Physical child abuse, (R= -0.542, P< 0.023). The study recommends that the government should ensure inclusion of child abuse information in various levels of education to equip children with protective information and skills and also to reduce stigma among the affected children.

Keywords: Physical Child Abuse, Academic Performance Public Primary, Kiambu.

An Assessment of Guidance and Counselling Programmes Equipment Available in Secondary Schools In Bureti Sub-County

Kesui, Hellen C.

University of Kabianga

Muchemi Peter & Muriithi Waweru

Bomet University College

Students in secondary schools face cases of indiscipline. Cases of indiscipline seem to be increasing causing a concern to school manager, parents and the communities at large. Although counseling services are available in schools, there levels of indiscipline cases are significantly high. The purpose of this study was to evaluate equipment available for guidance and counselling programmes in secondary schools in Bureti Sub-County. The Social Learning and Operant Conditioning theories informed the study by guiding on organization of guidance and counseling in school for effective behavior change. The target population comprised 52 public secondary schools, 52 head teachers, 52 teacher counsellors, 540 teachers and 10532 students. A A sample of 10 secondary schools, 10 head teachers, 10 teacher counsellors, 108 teachers and 2106 students were selected through the purposive sampling technique. Stratified Sampling technique was used to select the secondary schools that were studied whereby the strata consisted of mixed day boarding school, mixed day school, boys' only boarding school, girls' only boarding school and girls' only day schools. Structured questionnaires and interview schedules were employed in gathering data from the sampled respondents. The data was analyzed using descriptive statistics and tested using Pearson product moment correlation coefficient using Statistical Package of Social Sciences. Findings from the study revealed that the facilities for counselling were not available in many schools, where 66.7% of the teacher counselors indicated that the ministry of education does not provide facilities to schools for guidance and counselling. Schools lacked private guidance and counselling rooms that would enhance confidential sessions. It is therefore recommended that school managers should be sensitized on the importance of guidance and counseling to enable them put more resources in the department. This will encourage



more students to visit the department for help, and hence improved performance in academics and discipline.

Keywords: Guidance, Counselling, Guidance And Counselling Programmes Equipment

Effect Assessment of Re-Tooling on Guided Writing Skills in English in Public Junior Schools in Bomet Central Sub-County, Kenya.

Kosgey Kiprono Robert, John Wayongo & Waweru Muriithi

Bomet University College

In many educational settings, the need for continuous teacher development is critical, particularly in improving core skills like writing. Despite efforts to enhance English language instruction, students in Bomet County were identified to have had guided writing challenges that were considered to be addressed through the commenced teacher re_tooling. The study aimed to address poor academic performance in English, specifically in guided writing, among Junior School students in Bomet Central Sub_County, Kenya. In November 2022, 72.57% of candidates in the Kenya Primary School Education Assessment(KPSEA) performed Below Expectation in guided writing.To address this, 108 public Junior School teachers in Bomet Central Sub-County were re-trained in early 2023, aiming to improve English performance among 4,078 students transitioning to Junior School. The study evaluated the impact of this re-training on Grade Eight students' guided writing skills, focusing on organization of content. A causal-comparative design was used, with 244 students and 6 teachers sampled from 1,223 students and 32 teachers across five educational zones. Data were collected using questionnaires, observation checklists, and written tests, analyzed with SPSS and thematic analysis. The study found that while re-tooling significantly improved teachers' instructional competence in guiding students' organization of content (p-value = 0.030), it did not lead to observable changes in classroom practice or notable improvements in students' written performance. To enhance the effectiveness of re-tooling, this study suggest that teacher training programs should incorporate practical demonstrations, peer coaching, and real-time classroom observations to ensure proper application of skills. Additionally, structured mentorship programs should be introduced to provide continuous support. Teachers should also adopt formative assessment techniques, such as structured rubrics and peer reviews, to track students' progress effectively.Further studies to whether Integrative technology, including digital writing tools and interactive teaching strategies in enhancing organization of content are being utilized by schools in curriculum-aligned learning resources like structured prompts and scaffolding exercises.Future studies on Education policymakers must be carried out to establish whether training policies have been refined to align with modern pedagogical approaches that impact classroom outcomes in Competency Based Curriculum.

Key words: Re_tooling, Guided Writing Skills, Organization of Content.



The Energy Drinks Phenomenon: Patterns of Consumption, Risks and Intervention Strategies amidst Rising Substance Abuse in Kenyan Universities.

Waweru Muriithi

Bomet University College

E-mail: wmuriithi@buc.ac.ke

Energy drinks have become a widespread sensation among university students in Kenya, driven by academic pressures, social influence, and the need for enhanced physical and mental performance. This popularity is fueled by aggressive marketing, easy availability and misconceptions about their benefits. The excessive consumption and abuse of energy drinks poses serious health risks key among them being cardiovascular complications, sleep disorders, anxiety and potential addiction. The high caffeine and sugar content in these drinks acts as a gateway to more potent stimulants and substances use contributing to the rising trend of drug abuse in Kenyan universities. This is against a backdrop of recent findings that indicate at least 50% of university students in Kenya having abused one drug or substance in their lifetime and a further 25% of university students currently using at least one drug or substance of abuse. This paper examines the key factors behind the surge in energy drink consumption, the associated health and behavioral risks and their role in the broader context of substance abuse among university students. It further explores possible interventions, including policy regulations, awareness campaigns and university-based support systems to curb the misuse of energy drinks and mitigate their contribution to the drug abuse menace. Addressing this issue is crucial in safeguarding student health and promoting responsible consumption habits.

Key words: Energy drinks, Health Risks, Substance abuse, University Students

A survey of on-farm uses of rice (*Oryza sativa* L.) by-products in Mwea rice irrigation scheme, Kenya

Gideon Kalii Muli^{1*}, Alex Machio Kange² and John Byalebeka¹

¹ Faculty of Agriculture Uganda Martyrs University, Uganda

E-mail: gideonkalii@gmail.com / Telephone: +254725082383

²School of Pure and Applied Sciences, Bomet University College, Kenya

P. O. Box 701 -20400 Bomet, Kenya

*Corresponding author: gideonkalii@gmail.com

Rice (*Oryza sativa* L.) farming has received considerable attention in developing countries due to its significant contribution to smallholder farmers' incomes and food security. In addition, its by-products, rice straw and husks can be used as animal feed, making biochar/ briquette's, organic manure and also to make furniture. Therefore, the objective of this study was to assess the available quantities and uses of the rice by-products, rice straw and husks at farm-level and rice mills in Mwea Rice Irrigation Scheme (MRIS) located in Kirinyaga County in central Kenya. A survey of 300 randomly selected rice farmers and a number of rice hulling mills was conducted using a semi-



structured questionnaire in the five rice blocks (Karaba, Mwea, Tebere, Thiba and Wamumu) of MRIS. The results revealed that 67% of the farmers had medium sized (1-10 acres) rice fields, with 84% of the farms producing 21-30 bags (each 90kg) of milled rice per acre. This rice yield was resulting from large quantities of rice straw and husks, with 70% of the straw being used to feed livestock and 55% of rice husk (RH) being used in making biochar. Rice straw and husks have great potential for domestic and industrial processing, the straw as source of livestock feed and husk as source of preparation of activated carbon.

Key words: rice; rice husks; rice straws; biochar

Correlation between C and F Electrons in Heavy Fermion Superconductors

Horace Kibe, Everlyne K Amadi

Bomet University College

The integrated s-wave and p-wave Cooper pairing in Uranium and Cerium based heavy fermion systems have been studied by analysing the periodic Anderson model by means of the Bogoliubov-Valatin approach. The interorbital Cooper pairing between a conduction electron (c electron) and an f electron, called the “c-f pairing.” S-wave and p-wave superconductivity appears to coexist with long-range antiferromagnetic order. The ground state energy was found to be 0.02eV for the Cerium based compounds while that of Uranium based compounds was 0.033eV. The value of E decreases below the transition temperature and goes to zero at zero Kelvin and this is consistent with the nature of the super-fluid state. The total energy of the system increases with increase in temperature of the system. The entropy at T_c was found as $\sim 4 \times 10^{-26} J/K$ and $\sim 1 \times 10^{-25} J/K$ for Uranium and cerium-based compounds respectively. These results establish the fact that the pairing model in Uranium based heavy fermion superconductors is that of integrated s-wave and p-wave in the presence of finite Coulomb repulsion.

Crude petroleum-oil biodegradation efficiency of *Bacillus subtilis* and *Pseudomonas aeruginosa* strains isolated from a petroleum-oil contaminated soil from Ngara East at Nairobi, Kenya

Godfrey O. Mauti^{*1}, David Keno Kowanga²

¹Bomet University College ²Maseno University

gomare@buc.ac.ke

The efficiency of *Bacillus subtilis* DM-04 and *Pseudomonas aeruginosa* M and NM strains isolated from a petroleum contaminated soil sample from Ngara East garage at Nairobi was compared for the biodegradation of crude petroleum-oil hydrocarbons in soil and shake flask study. These bacterial strains could utilize crude petroleum-oil hydrocarbons as sole source of carbon and energy.



Bioaugmentation of TPH contaminated microorganism with *P. aeruginosa* M and NM consortia and *B. subtilis* strain showed a significant reduction of TPH levels in treated soil as compared to control soil at the end of experiment (120 d). *P. aeruginosa* strains were more efficient than *B. subtilis* strain in reducing the TPH content from the medium. The plate count technique indicated expressive growth and biosurfactant production by exogenously seeded bacteria in crude petroleum-oil rich soil. The results showed that *B. subtilis* DM-04 and *P. aeruginosa* M and NM strains could be effective for in situ bioremediation.

Keywords: *Bacillus subtilis*; Biodegradation; Bioremediation; Biosurfactant; Polyaromatic hydrocarbon (PAH); *Pseudomonas aeruginosa*; Total petroleum hydrocarbon (TPH)

Controlled Fermentation of African Indigenous Vegetables to Improve Functionality, Lower Postharvest Losses, and Increase Product Safety

Eliud N. Wafula¹, Paul W. Muyoma¹, Melanie Huch², Frommherz Lara², Bernhard Trierweiler²

^{*1} Bomet University College, Department of Physical and Biological Sciences, PO Box 701-20400, Bomet, Kenya, ²Max Rubner-Institute, Federal Research Institute of Nutrition and Food, Haid-und-Neu-Str. 9, 76131 Karlsruhe, Germany

*Corresponding Author: Eliud N. Wafula, Department of Physical and biological Sciences, Bomet University College, P.O.BOX 701-20400, Bomet, Kenya, email address: eliud.wafula@buc.ac.ke, Tel: +254726914690.

African indigenous vegetables (AIVs) play an important role in the food intake of many Africans. They can help to alleviate malnutrition among the poor due to their nutrient-rich nature. However, the warm and moist weather of most African countries, and inadequate postharvest handling facilities and technologies, cause massive losses of these vegetables. Fermentation is considered a better alternative processing technique due to the enhanced safety and retention of nutrients and phytochemical contents and sensory properties of the finished product. In Africa, fermentation of AIVs using lactic acid bacteria (LAB) starters is not widely adopted. In this study, a combination of *Lactobacillus plantarum* /*Lactobacillus fermentum* and *Lactobacillus fermentum*/*Lactococcus lactis* (inoculum 10⁶-10⁷ cfu/ml) were used to ferment 1 kg of Africa black nightshade (*Solanum scabrum* and *Solanum nigrum*, and African Spiderplant (*cleome gynandra*) leaves in 10 liter culture buckets in the presence of 3% salt and 3% sugar at 25°C for 144h. The vegetables were fermented to determine the effect of lactic acid bacteria starters on product safety (microbial and anti-nutrients) and functionality (nutrients, phytochemicals, and antioxidant activity). The pH values and microbial counts of lactic acid bacteria, enterobacteria, yeast and molds were determined at 0, 24, 48, 72 and 144h. Vitamin B₁ and B₂ vitamin C and vitamin E were determined by HPLC, β-carotene (UV-Vis spectrophotometer) protein was evaluated by the Kjeldahl method, antinutrients (oxalates (HPLC), tannins (absorbance), alkaloids and saponins (methanolic extraction), crude fat was determined by solvent extraction and ash was determined by furnace method, minerals (calcium, potassium, iron and phosphorus) were determined by atomic absorption spectrophotometer, phytochemicals and antioxidant capacity were determined



by UV-Vis spectrophotometer. Fermentation of AIVs with LAB starters reduced the pH below 4 within 48h while spoilage microorganisms were inhibited after 72h. It reduced vitamin B₁ & B₂, C and β -carotene in all batches while it increased total ash, crude proteins, vitamin E, and crude fibers. It reduced anti-nutrients in all fermented batches. Starter-culture-inoculated AIVs had significantly higher antioxidant capacity with a 60–80% radical scavenging activity compared to levels in uninoculated batches. Therefore, the use of LAB starters contributes to a product of predictable quality and safety. It could increase nutrients and phytochemical contents, maintain antioxidant capacity, and reduce anti-nutrients.

Keywords: African indigenous vegetables, fermentation, lactic acid bacteria, safety, nutrient, antinutrients.

Microencapsulation of *Lactobacillus plantarum* subsp. *plantarum* CICC 6240 for oral delivery of Bovine Serum Albumin

Sabella Jelimo Kiprono¹, Muhammad Wajid Ullah⁴, Zhijun Shi², Guang Yang^{2,3*}

¹Department of Medical Laboratory Sciences, Masinde Muliro University of Science and Technology, 190-50100, Kakamega, Kenya

²Department of Biomedical Engineering, Huazhong University of Science and Technology, Wuhan 430074, P.R China

³National Engineering Research Centre for Nano-Medicine, Huazhong University of Science and Technology, Wuhan 430074, China

⁴Nanjing forest University, College of Light Industry and Food Engineering

*Corresponding author: sabkip@gmail.com

Probiotics are commonly used for the potential treatment of gastrointestinal tract (GIT) infections. Microencapsulation has been identified as an effective method to protect probiotics from the harsh environment of the GIT during oral delivery. While surface modification of probiotics and their encapsulation with biotherapeutic compounds for oral delivery has received limited research, this study evaluated the efficiency of surface-modified *Lactobacillus plantarum* (L. *plantarum*) subsp. *plantarum* CICC 6240 for the oral delivery of bovine serum albumin (BSA). The encapsulating materials were evaluated for their swelling behavior in different simulated fluids. Alginate was crosslinked with CaCl₂ and freeze-dried to obtain calcium alginate microcapsules. Additionally, calcium hydrogen phosphate microcapsules were formed by adding Na₂HPO₄ to the calcium alginate microcapsules. The probiotic L. *plantarum* was surface-modified with 1% sodium alginate and crosslinked with calcium chloride to obtain calcium alginate-coated cells. A precipitate layer of Na₂HPO₄ was then added to obtain mineralized cells. The encapsulated L. *plantarum* cells were entrapped with BSA. The encapsulated L. *plantarum* was morphologically characterized using SEM and chemically analyzed using FTIR. Release and viability of the encapsulated L. *plantarum* were also determined. The microcapsules demonstrated good swelling behavior, indicating their suitability as materials for surface modification. FTIR analysis confirmed the chemical structure of the entrapped



BSA on the cell surface. Entrapment efficiency showed that over 90% of the BSA was successfully entrapped on the cell surface. Furthermore, more than 40% of BSA release from the cell surface was observed. SEM analysis of the surface topography revealed that the addition of alginate enhanced the integrity and provided protection to the *L. plantarum* cells. Colony growth of *L. plantarum* on the surface of Man-Rogasa-Sharpe (MRS) agar confirmed the growth of the surface-modified, BSA-entrapped cells after exposure to simulated intestinal fluid (SIF) and simulated gastric fluid (SGF). The probiotic cells were successfully surface-modified with the hydrogel without compromising cell functionality. The surface-modified *L. plantarum* cells have potential applications in the biomedical field as carriers for the delivery of other beneficial human biotherapeutic components, which could improve human gut health.

Keywords: BSA, Bio therapeutics, GIT, Microencapsulation, Probiotics, Swelling behavior

Moderating Effect of Quality Management System on The Relationship between Inbound Logistic Strategies and Sustainable Procurement Performance among Kenya Tea Development Agency Factories in Kenya

Joyce Cheruto Rotich¹ , Dr. Pauline Keitany² , Dr. Penina Langat³ University of Kabianga

Kenya Tea Development Agencies factories have adopted inbound logistics strategies as well as quality management system with the aim of turning around their performance and hence reduce on operational costs leading to sustainable procurement performance. However, despite this, the factories still experience wide variations in earnings. The drop in earnings and high variation in tea bonuses among factories has been blamed on operational cost at the factory and the quality management system being adopted by these factories. This points out that although inbound logistics have been adopted, they have not resulted in sustainable procurement performance. The purpose of this study was to establish the moderating effect of quality management system on the relationship between inbound logistic strategies and sustainable procurement performance among Kenya Tea Development Agencies Factories in Kenya. The study adopted correlation research design. The target population of the study was 188 staff drawn from the 16 Kenya Tea Development Agencies managed Region 5 factories. A census method was used to collect data from the production managers, information communication technology managers, procurement Managers, leaf base managers, factory unit managers and directors using a structured questionnaire. The validity of the instrument was determined through professional judgment and reliability was determined using Cronbach's alpha coefficient where the alpha coefficient of 0.865 was actualized. The findings revealed the moderating effect of quality management system had a positive significant relationship on inbound logistic strategies and sustainable procurement performance ($r = 0.526, p < 0.05$). The results showed that R Square changed from 30.8% to 41.2% as a result of the moderator effect of quality management system and that changed was significant. The study recommends that factories sourcing strategies need to employ quality management system by following total quality concept's guiding principles in the management and purchase of material resources. The study findings contribute to the existing body of



knowledge in relation to the moderating effect of quality management system on the relationship between inbound logistic strategies and sustainable procurement performance by creating new knowledge. The results of this study may advice on policy formulation in relation to quality management system on inbound logistics strategies and sustainable procurement performance. Other researchers may benefit from the literature on inbound logistics and sustainable procurement performance since the current study provided a basis for further studies. Key Words: Inbound Logistics, Quality management system and Sustainable Procurement performance

Assess Gender Capacity Building Initiatives Towards Kenya's External Trade Policy Development Along Kenya Busia Border

¹ Kiptum, J.J.,¹ Rev. Dr. Odhiambo², E.O.S.&Dr. Ungaya, C.G¹ ¹Kisii University, Department of Political Science and Peace Studies ² Bomet University College, Department of Arts, Governance and Communication Studies

Trade liberalization in regional blocs and globally affect men and women differently. Gendered trade policies therefore ensure that both genders reap gains of free trade environment. Kenya External Trade policy development is yet to effectively address gender trade issues and in particular women as a vulnerable group at national and regional levels. For example, women are concentrated in the informal sector and account for 70 to 80 percent of persons engaged in petty and informal trading compared to their male counterpart. The objective of the study is to examine gender structures towards Kenya's external trade policy development. The study was guided by feminism foreign policy and international trade theories to explain interaction between variables as well as international trade theory. Descriptive survey research design was adopted. The target population of 558 from which a sample size of 187 was drawn. Simple random sampling, purposive, census and stratified was used to select respondents. Questionnaires, interview schedules, focused group discussions and content analysis was used in collecting both primary and secondary data. Descriptive statistics such as frequencies, percentages were used and data presented using tables and pie charts. Findings indicated that; 59% (10) respondents agreed that the executive is a major actor in Kenya external trade formulation while 29% (5) to parliament as a player. 6% (1) of the respondents agreed that the judiciary is also involved. Non-state actors seemingly are not involved in policy formulation as indicated in the findings. That the state executive and other government structures are key players in external trade policy formulation process. Other players like private sector, trade associations. involvement is limited to implementation. The study concludes that gendered institutional structures are not in place to ensure that Kenya external trade policy is gender sensitive. The policy lacks deliberate clauses on gender as a result of little participation of gender and in particular women in policy formulation level. The study recommends inclusion of extensive gender structures at trade policy formulation and implementation levels to cater particularly for interest of women as a marginalized group. Women trade associations, constitution of committees at both national, regional organs need to be part of formulation of Kenya external trade policy.



Key Concepts; *gender; capacity building initiatives; external trade policy development*

Impact of Electronic Cargo Tracking Systems on Cargo Security: A Case of the Inland Container Depot at Embakasi, Nairobi, Kenya

Roy Ochieng' Otieno¹ & Rev. Dr. Elijah O.S. Odhiambo²

¹royochieng71@gmail.com

²eodhiambo@buc.ac.ke

¹Department of Security Studies and Criminology, Mount Kenya University, ²Department of Arts, Governance and Communication studies, Bomet University College, Kenya

Kenya has implemented numerous reforms to enhance cargo security, with a strong focus on technological innovations. One such initiative is the Regional Electronic Cargo Tracking System (RECTS), introduced by the Kenya Revenue Authority (KRA) at the Inland Container Depot (ICD) in Embakasi, Nairobi. RECTS was designed to address persistent challenges such as cargo theft, tax evasion, and the illegal diversion of goods. However, the effectiveness of this system in securing cargo remains under-explored in the Kenyan context. Despite the technological advancements, KRA still faces obstacles, including technical failures, limited staff capacity, and inadequate infrastructure, which inhibit the full potential of RECTS. This study investigated the impact of RECTS on cargo security at the Embakasi ICD, employing a cross-sectional design. A total of 110 customs and technical staff from KRA were targeted, with participants selected through stratified random sampling. Data was collected using structured questionnaires. The findings revealed that RECTS significantly enhances cargo security by improving the detection of concealed items, monitoring goods in transit, and reducing cargo theft. The study concludes that technology is integral to cargo security at the ICD. To optimize RECTS's effectiveness, it recommends continuous staff training, infrastructure upgrades, and increased collaboration among stakeholders to facilitate trade and maintain system efficiency.

KEYWORDS: RECTS, Technology, Cargo security, Cargo safety, Kenya, Africa

Assessment of the development of innovative capabilities in Accounting and Finance students to support Kenyan national innovation agenda: A study of Bomet University College, Kenya

Patrick B. Ojera & Victor K. Kirui

Bomet University College

The role of higher education graduates for the knowledge society is critical in national innovation efforts. Graduates who have undertaken accounting should possess innovative capabilities beyond the traditional number-crunching disciplinary orientation. This is more particularly so in view of the development of information and communication technologies concomitant with the fourth industrial revolution that threaten to obliterate accounting profession in its present format. There is, therefore, need to foster innovation among the prospective graduates to prepare them to support Kenyan



national innovation agenda.

Guided by the perspectives of diffusion of innovation theory and transformative learning theory, the purpose of this study is to examine innovation capacity development among undergraduate accounting students in Kenya. The study will utilize a quantitative based electronic survey method administered to 150 students comprising of first year, second semester students enrolled for accounting course at Bomet University College. The variables for this study use consist of a four-item index to measure of students' intention to innovate. The findings are expected to reveal Innovation capacities of potential of graduates and thereby indicate capability for driving the Kenyan national innovation agenda. The practical implication of the study is a need to foster a innovation in future public financial managers for national sustainability. The social implications will be that study will promote creativity and innovation mind-set among managers of Kenyan public sector. It also provides an opportunity for a transformative educational experience in accounting education.

Keywords: innovation intention, accounting education, transformative education, public financial management

Public primary school teachers' awareness of the digital content to be integrated in the curriculum; the case of Homa Bay County, Kenya

Ouma Omito

Bomet University College

With current changes in the curriculum of Kenya from 8-4-4 to Competency Based Curriculum (CBC), it emerged that digital literacy was a core competency for both teachers and learners. The purpose of this study was to establish the awareness levels of public primary school teachers in using and integrating technology in teaching and learning. The study was conducted in selected public primary schools in Homa Bay County where teachers were sampled from the six sub counties of Homa Bay. It was based on one study objective: To establish teachers' knowledge of video, audio, images, texts and graphics. Data was randomly collected using questionnaires and interviews 362 teachers from the population of 6529 teachers in Homa Bay County. Results showed that majority of the sampled teachers (22.9%) were aware of the general digital content such as video, audio, images, texts and graphics but were not adequately proficient in manipulation skills such as drawing (6.8%), simulation (1.7%) and basic arithmetic (6.2%). It was concluded that teachers needed more hands on experience with technologies to improve their digital competence. Ethical issues such as confidentiality and respect were observed during the study.

TAFSIRI KWA UDUMISHAJI WA UTAMADUNI

Hellen Ngetich, Mhadhiri wa muda maalumu, Chuo Kikuu cha Bomet na Mzamifu, Chuo Kikuu cha Kabianga.

Ngetichhellen@buc.ac.ke

IKISIRI



Tafsiri ni uhawilishaji wa mawazo, taarifa au ujumbe uliopo katika maandishi kutoka kwa Utamaduni Chanzi hadi Utamaduni Lengwa ili kufanikisha mawasiliano miongoni mwa wanajamii wenye tamaduni tofauti na wanaozungumza lugha tofauti.

Makala hii inakusudia kuchunguza jinsi tafsiri inavyoweza kutumika kufanikisha mawasiliano na kudumisha utamaduni wa walengwa. Uchunguzi huu unaongozwa na nadharia ya utamaduni iliyopendekezwa na Basnett inayodai kuwa kutafsiri haihusishi tu upelekaji wa matini kutoka lugha moja chanzi kwenda kwa lugha lengwa bali uhusisha mawasiliano yanayovuka mipaka ya kitamaduni na lengo kuu la kutafsiri ni kupandikisha na kufungamanisha utamaduni . Mifano itatolewa kutoka kwa methali za lugha mbili zilizoteuliwa kimakusudi. Uchunguzi huu utakuwa wa manufaa kwa wanaisimu na watafiti wanaochunguza masuala ya tafsiri kwa misingi ya kiutamaduni au kwa kuongozwa na nadharia nyingine. Pia kazi hii inachangia katika kuendeleza maarifa katika uwanja wa tafsiri kwa kutoa mwanga wa namna ambavyo ni muhimu kuzingatia suala la utamaduni wakati wa kutafsiri ili kuzalisha tafsiri bora inayotosheleza mahitaji ya jamii lengwa.

Maneno muhimu: Tafsiri, Utamaduni, Udumishaji wa utamaduni, umuktadhaishaji, Lugha Chanzi, Lugha Lengwa, Matini.

