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REGIONAL CENTRE OF EXPERTISE ON EDUCATION FOR SUSTAINABLE DEVELOPMENT

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UNITED NATIONS UNIVERSITY

14th AFRICAN RCE REGIONAL CONFERENCE

BOOK OF ABSTRACTS

DATES: 28TH - 30TH AUGUST, 2024

VENUE: UNIVERSITY OF ELDORET

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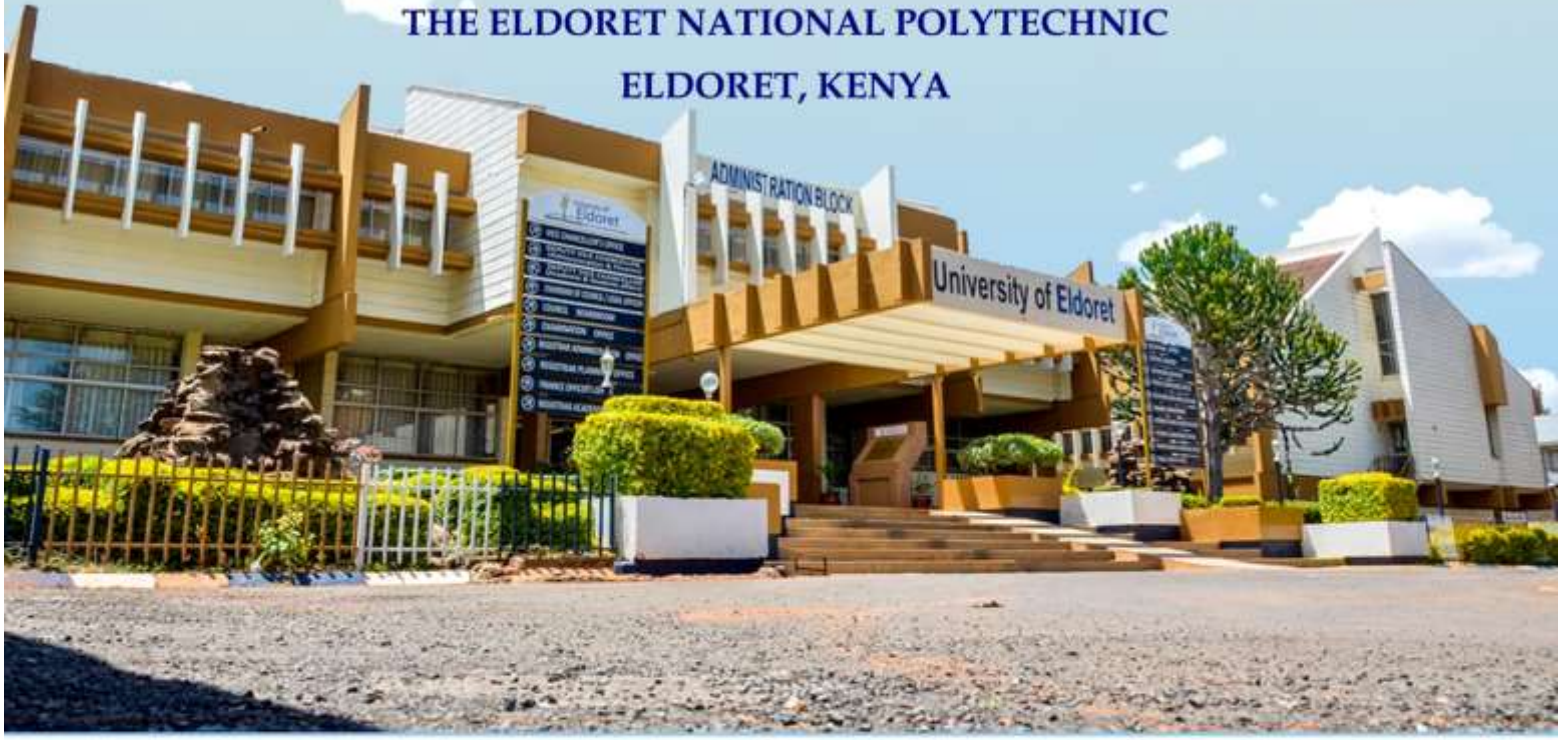
THE ELDORET NATIONAL POLYTECHNIC

ELDORET, KENYA



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THE 14TH AFRICA REGION REGIONAL CENTRE OF EXPERTISE MEETING

Dates :28th, 29th and 30th August 2024

THEME: ROLE OF RCE IN CLIMATE ACTION, EDUCATION FOR SUSTAINABLE DEVELOPMENT AND SUSTAINABLE DEVELOPMENT GOALS

Venue: University of Eldoret and

The Eldoret National Polytechnic

LOCAL ORGANISING COMMITTEE

1.	Prof.Vincent Sudoi - University of Eldoret	2	Ms. Ruth Nderitu - NEMA Headquarters
3	Dr. Christopher Saina - University of Eldoret	4	Mr. Eric Deche - NEMA Headquarters
5	Prof. Victor Kimeli - University of Eldoret	6	Mr. Joseph Masinde - NEMA Headquarters
7	Dr. Thomas Munyao - University of Eldoret	8	Mr. James Kemboi - Coordinator Nandi
9	Dr. Georgine Kemboi - University of Eldoret	10	Mr.Jeremiah Omwoyo - NEMA Headquarters
11	Prof. Lizzy Mwamburi- University of Eldoret	12	Ms. Karen Tanui - NEMA Headquarters
13	Dr. Mark Kiptui- University of Eldoret	14	Mr. Stephen Kimutu - NEMA E/M County
15	Mr. Agan Leonard-University of Eldoret	16	Dr. Cathrine Mbaisi – NEMA HQ.
17	Mr. Cyrus Kuya-University of Eldoret	18	Mr. Shiem Koiyet - NEMA Headquarters
19	Mr. Bernard Limo - University of Eldoret	20	Mr. Jonathan Ngeno - Eldoret National Poly.
21	Mr. Martin Walinga - RCE Northrift	22	Ms. Cynthia Chebii - University of Eldoret
23.	Ms. Elsie Boit - University of Eldoret		

BOOK EDITOR

1.	Ms. Emmy Kerich

Message from Prof. Thomas Cheruiyot - Vice-Chancellor, University of Eldoret

I welcome you all to this year's 14th Africa Region RCE Meeting which is being held at the University of Eldoret and Eldoret National Polytechnic as from 28th to 30th August 2024. This meeting is an important annual event for the Kenya Regional Centres of Excellence bringing together the 9 RCE Regional Hubs in Kenya namely RCE North Rift (the hosts), RCE South Rift, RCE Central Kenya, RCE Mount Kenya, RCE Kakamega-Western Kenya, RCE Nyanza, RCE Mau Ecosystem Complex, RCE Greater Pwani and RCE Greater Nairobi.

This years' theme "***Role of RCE in Climate Action, Education for Sustainable Development and Sustainable Development Goals***" is important as we are in an era that we are reclaiming back our environment, not only the physical but also the social, digital, financial and political
environments. Reading through the abstracts that are in this book, the authors have delved into the main gaps and issues within the various levels of environment and I believe the scholars and policy makers will gain knowledge to impact societies and pursue great scientific information that will help Africa attain sovereignty in the sector. With the challenges of climate change we need to generate climate smart solutions so as to manage climate risk. How do we make effective climate smart solutions? We need to invest more in research, through such meetings we ensure that the solutions we create are outcome oriented and specific solution content that is specific and climate smart.

Through this meeting and collaborations we expect that an appropriate environment will be created between education institutions, governement institutions and the private sector that will enable us to work together to improve and enhance the quality of teaching, research and outreach through networking, peer learning, sharing and critiquing leading to African based solutions.

Let us generate new knowledge, test the research, provide thought leadership to guide policy makers and thereby transform and create centers of research leadership, excellence and expertise.

Message from Prof. Phillip Raburu - Deputy Vice-Chancellor (Planning, Research and Extension)

It is my pleasure to welcome you to this year's Africa Regional Centre of Expertise being held at the University of Eldoret and Eldoret National Polytechnic. This is the 1st time that the University has been charged with the responsibility to host this series of meetings which is a great honour to the University.

This conference theme, "***Role of RCE in Climate Action, Education for Sustainable Development and Sustainable Development Goals***". Climate Action and Sustainable

Development are very significant considering the push and pull between the ever increasing human population and the declining natural resources. Our environment continues to be negatively impacted by the human activities. This meeting has important sub-themes that adequately address these issues. The sub-themes, which address the wider needs of researchers and scholars include:

i) Mainstreaming of Gender Youth and Communities in Linking Climate Action with ESD and SDGs
ii) RCE Multi stakeholder Partnership as hubs for Education for Sustainable Development in Climate
Action and Climate Financing
iii) Enhancing Food Security and Sustainable Livelihood Through Climate Action.
iv) Translating SDGs and Global issues into Local Actions to address Climate Change
v) Waste and Pollution Control.
vi) Role of RCE in addressing Biodiversity Loss

The research we are engaged in addresses the myriad of challenges the continent of Africa and this is critical to the competitiveness and survival in the global market and we endeavour to create homegrown solutions. I welcome you to this conference and hope that your expectations as our esteemed guests will be addressed in the next three days.

Message from Prof. Vincent Sudoi - Coordinator RCE North Rift and Chair of the Local Organising Committee

On behalf of the Local Organising Committee, I welcome all the distinguished guests, presenters, students and visitors to the University of Eldoret for this 14th Africa Region RCE Meeting, held on 28th - 30th August 2024. The meeting brings together academicians, researchers, scholars and professionals from Africa and the world at large. The theme of this year's conference "***Role of RCE in Climate Action, Education for Sustainable Development and Sustainable Development Goals***" was chosen to contribute towards gathering of evidence in the field of climate action and education for sustainable development.

The abstract reviewers committee reviewed and accepted 35 abstracts from the Presenters that were received, translating to 96% acceptance rate. The papers will contribute new knowledge in all the sub-thematic area of the meeting.

The success of this event depended on the participation of the delegates gathered here and we truly appreciate. We also mention our esteemed sponsors namely County Government of Uasin Gishu, Kaiboi National Polytechnic, Kenya Platform for Climate Governance, National Environment Management Authority (NEMA), Eldoret National Polytechnic and University of Eldoret for their support both materially and in kind. I would like to thank members of the local organising committee who worked tirelessly to ensure that the conference will come to fruition and its eventual success.

I welcome you again to university of Eldoret. We hope you will spare some time off the meeting to visit the attractions that the 5th City has to offer.

RCE NORTH RIFT BLURB

The 14th Africa RCE Meeting will be held in hybrid format on 28th to 30th August 2024 in Eldoret Kenya. The meeting will be hosted by RCE North Rift. It will be held at The University of Eldoret and The Eldoret National Polytechnic under the theme**: *"Role of RCE in Climate Action, Education for Sustainable Development and Sustainable Development Goals"*.** The RCE North Rift Covers Nandi, Uasin Gishu, Elgeyo Marakwet, Trans Nzoia, West Pokot, and Baringo counties which collaborate under the North Rift Economic
Bloc (NOREB). The RCE North Rift is hosted at the University of Eldoret and supported by NEMA-Kenya, The Eldoret National Polytechnic among other stakeholders. The RCE advances climate action, Education for Sustainable Development and the Sustainable Development Goals through collaborative efforts with local communities, Academia and governmental bodies fostering knowledge exchange, capacity building, and innovative solutions. The meeting will highlight these collaborative efforts. It will seek to ignite a discussion to address Africa's climate vulnerability and promotes sustainable development practices. Participants will have an opportunity to explore the region's natural beauty, Cultural, Social heritage and engage with the local communities.

CONFERENCE PROGRAM

Date and time	Activity description	Facilitator
27th August 2024		
0700HRS - 1700HRS	Arrival of guests	RCE North Rift
Day 1: 28th August 2024, University of Eldoret		
0800HRS – 830 HRS	Arrival and Registration	Secretariat
0830 HRS – 0930 HRS	Courtesy call to Vice-Chancellor University of Eldoret	Corporate Affairs (Ms. Cynthia Chebii)
	Ceremonial tree planting	
0930HRS – 1000HRS	Anthem (National &East African)	**Master of Ceremony** Prof. Lizzy Mwamburi (Director Research and Innovation-UoE) **Rapporteur** Mr. Kuya Cyrus
	Prayers	
	Entertainment	
1000 HRS -1130HRS	Brief introduction of the program **Prof. Vincent Sudoi** RCE -North Rift Coordinator Welcoming remarks and invitation of the VC University of Eldoret- **Prof. Philip Raburu**	
	VC University of Eldoret address– **Prof. Thomas Cheruiyot** C. Principal Eldoret National Polytechnic – **Mr. Charles Koech**	
	1. Opening remarks and invitation of guests: Director General, **Mamo B. Mamo**, EBS 2. Acting Secretary General/CEO Kenya National Commission to UNESCO**: Dr. James Gichia Njogu, HSC** **3.** Regional Office Africa United Nations Environment Program (UNEP): **Dr. Rose Mwabeza** 4. UNESCO Regional Director and Representative Eastern Africa **Prof. Hubert Gijzen** 5. Regional Advisor to Africa	**Chair:** Dr. Catherine Mbaisic **Rapporteur** Mr. Agan Leonard

	Region RCEs: **Dr. Akpezi Ogbuigwe**. **6.** African RCE Coordinator, **HM Chief Masango Sone, RCE Buea , Cameroon** 7. Global RCE Service Centre, United Nations University Institute for the Advanced Study of Sustainability: **Jonghwi Park** 8. Deputy Director of Office of Environmental Education, Ministry of the Environment, Japan **Ms. Tokie IZAKI** 9. Assistant Director Teachers Education Dpt; Kenya Institute of Curriculum Development Kenya**: Dr. Josephat Miheso** **10.** Principal Secretary Ministry of Education Kenya **Dr. Belio Kipsang, CBS**	
1130HRS-1150HRS	**Keynote speech:** Principal Secretary Ministry of Forestry and Environment Kenya **Dr. Eng, Festus K. Ngeno , PHD, MIEK**	**Session Chair**: Dr. Catherine Mbaisic **Rapporteur** Mr. Agan Leonard
1150HRS -1200HRS	Plenary Vote of Thanks	**Prof. Philip Raburu** **DVC, PRE**
1200HRS – 1215HRS	Tea Break, Photo Session	Mr. Limo Barnard Ms. Cythia Chebii
1215 HRS – 13.15HRS	Parallel Sessions **Sub-theme 1:** Mainstreaming of Gender Youth and Communities in Linking Climate Action with ESD and SDGs	**Chair:** Mr. Jonathan Ngeno **Rapporteur:** Ms. Clarity Jeruto

	Presenters: **1.** Debates in Teacher Training Colleges to create awareness on climate Action and other Environmental Issues: **Dr. Ruth Nderitu** **2.** The Value of Indigenous Language in the development of Science and Technology: **Dr. Mustapha Abubakar Sadiq** 3. Gender Equality-Responsive Strategies for Coastal Climate Resilience in Asia-Pacific Countries (Indonesia, Vietnam, and Bangladesh): **Mr. Eko Z. Ernadai** 4. Innovative Digital Solutions for Plastic Waste Management: Youth Perspectives and Engagement: **Mr**. **Adeolu Odusote** **5.** Establishment of Youth-Led Renewable Energy Cooperatives for Sustainable Development in Rural and Semi-Arid Regions: **Mr. Abdulhamid Tahir Hamid** **6.** Empowering Youth for Sustainable Climate Actions: Catalyzing Local Innovations through Education for Sustainable Development: **Mr. Justus Kipkogei** 7. Indigenous Trees Arboretum and Nursery: Restoring Health through Tree Therapy: **Dr. Oby Obyerodhyambo**	

	Sub-theme 2: RCE Multistakeholder Partnership as hubs for Education for Sustainable Development in Climate Action and Climate Financing <u>Presenters:</u> **1.** Demystifying Climate Finance: Building Locally Led Innovative Solutions With Communities: **CPA. Hosea K Kandagor** 2. Influence of BOM budgeting competencies on governance of public primary schools in Mombasa County, Kenya: **Ms. Mwanasiti Mbete** 3. Effects Of Micro-Credit On Cassava Production: A Pathway To Poverty Reduction And Economic Empowerment For Small Holder Farmers In Obio/Akpor Local Government Area Of Rivers State, Nigeria: **Mr. S. U. Nwokugha** 4. Youth Entrepreneurship for Sustainability: **Dr. Gathu Kirubi** 5. Nexus between BOM decision making competencies and governance of public primary schools in Mombasa County, Kenya: **Ms. Mwanasiti Mbete**	**Chair:** Mr. Welinga Martin **Rapporteur:** Ms. Janerose Nyambura
1315HRS – 1400HRS	Lunch Break	Ms. Sarah Tanui HoD Guest House
1400HRS- 1600HRS	Report back from group work and sessions	**Chair:** Dr. Georgine Kemboi

	Plenary 1	**Rapporteur:** Mr. Kipkogei Justus
1600HRS -1630HRS	Tea and End of day 1	
DAY 2: 29TH AUGUST 2024		
0800HRS-11.00HRS	Plenary Recap of Day 1 Parallel Session	**Chair:** Dr. Georgine Kemboi **Rapporteur:** Mr. Justus Kipkogei
	Sub theme 3: Enhancing Food Security and Sustainable Livelihood Through Climate Action. <u>Presenters:</u> 1. Enhancing Food Security and Sustainable Livelihood Through Climate Action**: Dr. Mark Kiptui (**Dean School of Environmental Sciences and Natural Resource Management) **2.** Enhancing Food security and sustainable livelihood through climate action: **Dr. Christopher Saina:** **3.** Investigation of Percentage Germination on Seed Cleome Gynandra and Solanum Sp at Different Rates with Kinetins: **Mr. Moses Muga** 4. Evaluating the Effects of Different Soil Amendments on Soil Physicochemical Properties, Growth, and Yield of Wheat (Triticum aestivum L.) in North–Central Namibia: **Haufiku A. M**	**Chair:** Dr. Saina Christopher **Rapporteur:** Ms. Dorothy Jerono

	Sub theme 4: Translating SDGs and Global issues into Local Actions to address Climate Change <u>Presenters:</u> 1. Engagement in RCE MauEcosystem complex for attainment of sustainable evolopment Goals : **Prof**. **Wilkister Nyaora Moturi** 2. Land Restoration for Achieving the Sustainable Development Goals and Climate change mitigation:**Prof. Vincent Sudoi (Coordinator RCE-North Rift)** 3. Translating SDGs and Global issues into Local Actions to address Climate Change, women and Youths perspective : **Dr. Georgine Kemboi** **4.** Seasonal climatic changes drive variation in selected soil: **P.J.K. Rongoei.** **5.** Kenya's Transformation Agenda Since Independence And Future Projection: **Mr. Kongani Nicholas Mulama**	**Chair:**Prof. Wilkister Nyaora K **Rapporteur:** Ms. Clarity Jeruto

1030HRS-1100HRS	Tea Break,	
1100HRS-1300HRS	**Parallel Session** **Sub theme 5:** Waste and Pollution Control. Presenters: 1. Harnessing Local Initiatives for Global Impact: CFAs, WRUAs, and RCEs in Advancing SDG 12 for Sustainable Waste and Pollution Control**: Dr. Patricia Mumbi Wambua** 2. Towards a circular Economy-Policy and Legal Framework in Waste Management in Kenya: **Dr. Catherine Mbaisi** 3. Ion exchange properties of onion skin and orange mesocarp: A sustainable approach to metal ion removal from aqueous solutions: **Prof. Sampson Kofi Kyei** 4. Derivatives of Red Onion Skin Extract as Green Scale Inhibitors: **William Iheanyi Eke** **5.** Fluoride levels in sediments, springs and river water in the upper River Njoro: **Mr. J Sanga** **6.** Human Activities and Physical-Chemical parameters along River Kiminini, Trans-Zoea County, Kenya**: Ms. Barasa Charity** **7.** The Contribution of Soil Permeability to Pesticide Aquifer Vulnerability along the Shores of Lake Naivasha,	**Chair:** Dr. Thomas Munyao **Rapporteur:** Ms. Clarity Jeruto

	Kenya: **Dr. Simon Mburu Njoroge**	
	Sub theme 6: Role of RCE in addressing Biodiversity Loss <u>Presenters:</u> 1. Role of RCEs in Implementing the Kunming-Montreal Global Biodiversity Framework (GBF) was adopted during the Fifteenth meeting of the conference of the parties (COP 15) IN Montreal Canada**: Dr. Joseph Masinde** 2. Sustainable use of Biological assets for medicinal use: **Dr. Pascaline Cheruto** **3.** Plastic Pollution Along The Shores Of Lake Victoria, Nyamagana District, Mwanza: **Ms. Neema Mafimbo** 4. Occurrence, spatiotemporal variations and ecological risks of contaminants of emerging concern in selected rivers in Western Kenya: **Chepchirchir Ruth** **5.** Environmental Science: **Professor ilyas Muhammad** **6.** Integrated strategies in cubing biodiversity loss and climate change: **Dr Lucy Wanjohi**	**Chair:** Dr. Pascaline Jeruto **Rapporteur:** Ms. Dorothy Jerono
1300HRS – 1400HRS	Lunch Break	
1400HRS- 1600HRS	Summary of case presentations/panel discussion Re:cap/ Way forward Key Panelist	**Chair:** Mr. Deche Eric **Rapporteur:** Mr. Agan Leonard

1600HRS -1630HRS	Tea and End of day 2	
Day 3; 30th August 2024, The Eldoret National Polytechnic		
0800HRS-11.00HRS	Africa RCE Youth Forum Keynote Speeches. **Dr. Akpezi Ogbuigwe** • Plenary Discussion Organizational matter (Nomination on RCE Regional Youth Coordinator)	**Chair:** Mr. Agan Leonard and Mr. Evans **O**uya- Africa RCE youth coordinator Rapporteur: Ms. Janerose Nyambura
1030HRS-1100HRS	TEA BREAK	
1100HRS-1300HRS	Parallel sessions • Pitching (Youths projects) • Art exhibition • Essays, songs, poems • Skills and innovation • Youth Cultural show • Election – Africa RCE youth leader	**Chair:** Mr. Jonathan Ngeno and Mr. Evans **O**uya **Rapporteurs:** Mr. Justus Kipkogei, Ms. Janerose Nyambura, Ms. Dorothy Jerono
1300HRS- 1400HRS	Lunch break	
1400HRS-1500HRS	Award Ceremony	Master of Ceremony
	Closing Ceremony	
0800HRS – 1500HRS	EXCURSION (OPTIONAL) Route 1: WEEE Center, TENP Route 2: Old Uganda Road Et Lt.	Team leaders for excursion

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Photo credit: photographer, Evans Kiplagat Moi 26

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SUB-THEME 1: MAINSTREAMING OF GENDER YOUTH AND COMMUNITIES IN LINKING CLIMATE ACTION WITH ESD AND SDGS

The Value of Indigenous Language in the Development of Science and Technology

Mustapha Abubakar Sadiq

Abstract

In a world filled with the product of scientific inquiry, scientific literacy has become a necessity for everyone, because it is indispensable to achieving technological development of any nation. Every one need to use scientific information to make choices that arise every day. Everyone needs to be able to engage intelligently in public discourse and debate about important issues that involves science and technology. Also, everyone deserves to share in excitement and personal fulfillment that can come from understanding and learning about the natural world. On the other hand, importance of the language in every aspect of life cannot be over emphasized; it is synonymous with communication among individuals, societies, organizations and within the institutions of government. Language therefore, cannot be neglected in any human development because it is a mirror and lamp for thought, as well as the central vehicle for civilization and development. The focus of this paper is to look at the place and value of indigenous language in the development of science and technology. It also defined science, technology and indigenous language, and also pointed out some of the problems of indigenous language and its remedy.

Keywords: *Indigenous Language, Development, Science and Technology*

Gender Equality-Responsive Strategies for Coastal Climate Resilience in Asia-Pacific Countries (Indonesia, Vietnam and Bangladesh)

Eko Z. Ernadai

Abstract

This research seeks to pioneer gender-responsive approaches to bolster coastal climate resilience in Indonesia, Vietnam, and Bangladesh. Each country grapples with distinct challenges in addressing gender disparities exacerbated by climate change impacts. Indonesia's vast archipelago faces escalating sea levels and severe weather events

complicated by diverse socio-cultural contexts hindering gender equity endeavors. Similarly,
Vietnam's vulnerable Mekong Delta sees women engaged in agriculture and fishing bearing disproportionate impacts of typhoons, storm surges, and saltwater intrusion. In Bangladesh, densely populated coastal areas confront cyclones and floods, underlining women's critical yet under-supported roles in agricultural and fishing sectors within climate adaptation strategies. The significance of this research stems from the convergence of gender inequality and climate resilience imperatives. Effective resilience necessitates inclusive policies empowering women and rectifying gender imbalances. This study endeavors to unearth, cultivate, and enact gender-responsive solutions centering on women's empowerment and bolstering community resilience. Methodologically, the research incorporates a comprehensive literature review, on-the-ground primary data collection, and the formulation of policy recommendations grounded in robust data analysis. Employing a mixed-methods approach involving interviews, surveys, and document scrutiny, the study illuminates significant gender disparities in climate vulnerability and adaptive capacities across the studied regions. Furthermore, the research explores specific examples of gender-responsive interventions, such as women-led mangrove restoration initiatives, microfinance programs, and participatory action research, in bolstering women's agency and fortifying community resilience. The research output comprises detailed policy directives, implementation blueprints, and empirical insights, enriching the scientific discourse and guiding policymakers, practitioners, and local stakeholders. Hence prioritizing gender equality in climate resilience endeavors, this study aims to fortify the adaptive prowess of coastal communities in Indonesia, Vietnam, and Bangladesh, thus significantly contributing to both mitigation and adaptation efforts.

Keywords*: Gender Equality, Responsive Strategies, Coastal Climate Resilience, Asia-Pacific Countries*

Establishment of Youth-Led Renewable Energy Cooperatives for Sustainable Development in Rural and Semi-Arid Regions

Abdulhamid Tahir Hamid

Abstract

The quest for sustainable development in rural and semi-arid regions necessitates innovative approaches that leverage local capacities and address environmental challenges. This abstract focuses on the establishment of youth-led renewable energy cooperatives, aligning with the goals of the Global Environmental and Climate Conservation Initiative (GECCI) and the African Union's Great Green Wall Youth Advisory Board (AU GGW YAB). These cooperatives aim to harness renewable energy sources, such as solar and wind power, to provide affordable and reliable energy access in underdeveloped areas, thereby promoting economic growth, improving quality of life, and mitigating climate change. Youth leadership is pivotal in driving this transformation, as young people bring creativity, enthusiasm, and a commitment to sustainable practices. By forming cooperatives, youth in these regions can collaboratively manage and operate renewable energy projects, ensuring local ownership and long-term viability. These cooperatives not only generate clean energy but also create employment opportunities, promotes entrepreneurship, and enhance community resilience. The proposed model emphasizes capacity building, technical training, and access to financing for young entrepreneurs, facilitated through partnerships with governmental bodies, non-governmental organizations, and international agencies. Through integrating renewable energy solutions with the objectives of the Great Green Wall Initiative, this approach contributes to combating desertification, restoring degraded lands, and promoting biodiversity. The initiative also aims to address energy poverty, reduce greenhouse gas emissions, and support sustainable agricultural practices through the availability of renewable energy. The cooperative model ensures that the benefits of renewable energy projects are equitably distributed, enhancing social cohesion and fostering a sense of community ownership. In conclusion, the establishment of youth-led renewable energy cooperatives represents a viable strategy for sustainable development in rural and semiarid regions. It leverages the potential of renewable energy to drive economic growth, environmental conservation, and social empowerment, in alignment with the broader goals of GECCI and AU GGW YAB. Through empowering youth to take the lead in renewable energy initiatives, this approach not only addresses current energy and environmental challenges but also paves the way for a sustainable and resilient future.

Keywords: *Youth, Renewable Energy, Cooperatives, Sustainable Development, Rural, Semi-Arid Regions*

Translating SDGs and Global issues into Local Actions to address Climate Change

Georgine Kemboi

Abstract

SDG localization is the process of adapting and customizing the SDGs and translating them into local development plans and strategies that fit the needs, context, and priorities of a particular region or locality, in coherence with national frameworks. It means placing local communities at the center of sustainable development and anchoring development action on the principles of inclusion, partnership, and multilevel governance, with adequate data and financing availability at the local level. To be climate smart is to be inclusive, women and youth are powerful community and economic change makers. Their participation, input and influence have however been ignored in majority of the projects and climate change related initiatives. This has led to continued social and economic inequality, poverty and susceptible local economies. Kenya envisions being a middle- income country by the year 2030 and agriculture sector has been identified as one of the key sectors to contribute to the projected annual national economic growth. The sector is however the most vulnerable to impacts of climate change and extreme weather events. Due to these challenges, there is need to develop interventions that make agriculture more resilient to climate change and extreme weather events while minimizing its contribution to greenhouse gas emissions. Climate smart agriculture (CSA) is an approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. CSA aims to achieve three main objectives: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/or removing greenhouse gas emissions, where possible. By bringing on board women and youth who are powerful community and economic change makers, SDGs can be successfully integrated into local actions.

Keywords: *SDGs, Global issues, Local Actions, Climate Change*

SUB-THEME 2: RCE MULTI STAKEHOLDER PARTNERSHIP AS HUBS FOR EDUCATION FOR SUSTAINABLE DEVELOPMENT IN CLIMATE ACTION AND CLIMATE FINANCING

Effects of Micro-Credit on Cassava Production: A Pathway to Poverty Reduction and Economic Empowerment for Small Holder Farmers in Obio/Akpor Local Government Area of Rivers State, Nigeria

S. U. Nwokugha

Abstract

Pathway to poverty reduction and economic empowerment for small holder farmers in Obio/Akpor Local Government Area of Rivers State, Nigeria. The objectives were to describe the socio-economic characteristics of the cassava farmers using micro credit in the study area, determine the effect of micro-credit on cassava producers, determine the level of access to micro-credit on cassava producers in the study area, and know the constraints affecting Cassava producers' access to micro-credit in the study area. It involves a study of 100 Cassava farmers which were selected randomly from Ten (10) communities. Data were collected using structured questionnaire, scheduled interview with respondents and also from journals, publication, text books and previous works. Objectives were analyzed using descriptive analytic tools such as tables, mean and percentages. Multiple regression was used to estimate the effects of micro-credit and level of micro-credit access. The coefficients of multiple determinant (R2) value of 0.836 indicate that 86% of the variation on effects of micro-credit on Cassava farmers can be explained by the independent variables in the regression having an F ratio of 1.09 in the double log. The result indicated that 42.2% of the respondents were in the age bracket of 45-55, 43.1% were observed to be in the age range of 26-45, 6.9% were observed to be in the age range of 56- 75 and 4.9% of the respondents were in the age range of 18-24. The socioeconomic characteristic such as income level were found to have a significant effect on the cassava producer access to micro-credit in the study area. The major constraints identified in the access to micro-credit limited documentation, struggle with financial literacy, affordability barrier, size of farm and cumbersome process having Average mean of 1.942. The findings reveal that gender, age, marital status, education level, and farming experience significantly impact farmers' access to microcredit.

Keywords: *Poverty reduction, Cassava Production, Economic empowerment, small holders Farmers*

Youth Entrepreneurship for Sustainability

Gathu Kirubi

Abstract

Globally and locally, there is strong consensus on why the Sustainable Development Goals (SDGs) are essential for sustainability. However, despite the strong consensus on the "why question," many gaps and challenges remain on the "how question" – in other words, how to deploy innovations and solutions to achieve sustainability rapidly and at scale. In this paper, we will argue that entrepreneurship is the answer to the how question for SDGs to be delivered rapidly, sustainably, and at scale, both locally and globally. Using case study approach and focusing on youth entrepreneurs in Kenya, this paper will explore the link between youth entrepreneurship and sustainability. Through the lens of solar technology, the study seeks to demonstrate how entrepreneurship training and mentorship for the youth can contribute to multiple SDGs including reducing poverty and hunger, improving public health, increasing access to affordable and clean energy and leveraging partnerships.

Keywords: *SDGs, youth, sustainability*

SUB THEME 3: ENHANCING FOOD SECURITY AND SUSTAINABLE LIVELIHOOD THROUGH CLIMATE ACTION

The Interconnectedness of Food Security, Sustainable Livelihoods and Climate Action

Christopher K. Saina

Abstract

Food security is a complex issue that involves a delicate balance of factors. It's more than just having enough food available; it's about ensuring that everyone has

consistent access to nutritious food. Food security means that all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. The main focus is on the interconnectedness of food security, sustainable livelihoods, and climate action. It emphasizes that food security involves ensuring everyone has consistent access to sufficient, safe, and nutritious food. The key components of food security—availability, access, utilization, and stability—and outlines strategies to enhance these through sustainable agriculture, infrastructure improvements, and reducing food waste. Additionally, it discusses the importance of climate action to protect and sustain global food systems, advocating for resilient, equitable, and environmentally sustainable practices to ensure long-term food security and livelihoods.

Keywords: *Climate action, food security, livelihoods, SDGs*

Climate change: A threat to Food Security and Sustainable Livelihoods and Human Existence

Mark Kiptui

Abstract

Climate change, which is a distortion in the normal patterns of climatic elements of temperature and precipitation due to greenhouse gases is a function and product of anthropogenic/ human activities namely production of greenhouse gases and subsequent global warming. This is the current single most threat to human survival. Greenhouse gas emissions and resultant global warming results in droughts, reduced food production, ozone layer depletion, casino genic impacts, heat waves, floods, snow melt in the polar regions, rise in sea levels, coastal land submergence, hot and humid conditions, increase in water and vector borne diseases, breakouts of wildfires among others. These threaten food security and sustainable livelihood effort and human existence. Food is the most important and critical human need whose absence threatens human existence. Climate action which refers to all efforts taken to combat climate change and its adverse impacts such as walking. Using bikes. Using public service vehicles among others may be the potential remedy for human survival-moving forward Food security and sustainable livelihood can only be assured through climate action. This implies going green in all our growth and sustainable development efforts.

Keywords: *Climate change, food security, human existence, livelihoods*

Investigation of Percentage Germination on Seed Cleome Gynandra and Solanum Sp at Different Rates with **Kinetins**

Muga Moses

Abstract

"African leafy vegetables (ALV`s) are highly nutritious and good sources of revenue in Kenya. However, production of these vegetables has been limited by seed dormancy. This study was conducted at the university of Eldoret, school of agriculture at the seed science and technology laboratory to assess the effect of kinetin on spider plant (*Cleome gynandra*) and African nightshade (Solanum sp.) seeds. The seeds were obtained from kenya seed company depot in eldoret town and a volunteer local farmer in Moiben, Uasin Gishu county for germination to ascertain purity of germ plasm. In a laminar flow cabinet, the seeds were soaked in 70% alcohol for three minutes, soaked in 1% of sodium hypochloride + 2 drops of tween per 100ml for 30minutes. They were then washed in distilled water 3 times for 5 minutes, then soaked in different concentration of kinetin (0, 0.005ppm and 0.01ppm) for 16 days. The experimental design used was Completely Randomized Design with 3 replicates. Seed viability and vigor parameters were assessed using the ISTA protocol. Data was collected on percentage germination (viability)and speed of germination index (vigor) and then subjected to analysis of variance using genstat statistical software version 14.2 at 5% level of significance. The means were separated using duncan multiple range test and kinetin at 0.005ppm had the highest speed of germination index and percentage germination of the other concentrations respectively. Kinetin illustrates how plant hormones have multiple roles related to different aspects of plant life, thus promoting cell division.

Keywords: *African leafy vegetables, spider plant, African nightshade, seeds, germinations*

Evaluating the Effects of Different Soil Amendments on Soil Physicochemical Properties, Growth, and Yield of **Wheat (*Triticum aestivum* L.) in North–Central Namibia**

Haufiku AM

Abstract

"Inherently poor soil fertility caused by decline of soil organic carbon have been identified as the major constraint limiting agricultural productivity especially in small–scale farming communities in North–Central Namibia. The soils are primarily sandy, low in organic matter, and highly stressed with nutrient deficiency, thus limiting crop production and sustainable agricultural development. Soil amendments can improve soil's physical and chemical properties, enhancing crop growth and yields. The field study was conducted at the University of Namibia–Ogongo Campus to investigate the effects of different soil amendments on soil physical and chemical properties, growth and yield of wheat for North-Central Namibian climatic conditions. The study adopted the randomized complete block design (RCBD). Treatments comprised of bio char and compost rates 0, 5, and 10 t ha –1 and N fertilizer rates 0,120 kg N ha –1 (B5, C5, B10, C10, B5C5, B10C10, B0C0N0, B5N120, B10N120, C5N120, C10N120, BC5N120, BC10N120, N120). Analysis of Variance (ANOVA), correlation coefficient, and repeated measure analysis was be performed to test the effects of soil amendments. The results of this study revealed that treatments had a significant effect on growth parameters as well as yield components. Soil amendments had a high significant (P < 0.001) on total number of tillers plant –1 and total number of spikes plant –1 . Compost 5 t ha –1 with N fertilizer increased plant height, total number of tillers plant –1 and total number of spikes plant –1 whilst Compost 10 t ha –1 increased spike length followed by the combination of bio char 10 t ha –1 and N fertilizer. The combination of bio char 10 t ha –1 increased actual grain yield. The results suggest that organic soil amendments have the potential to be used as a reliable fertilizer by farmers especially smallholder farmers who struggle to buy inorganic fertilizers because they are expensive. Although in our study they performed better with the addition of N fertilizer."

Keywords: *Soil Amendments, Physicochemical Properties, Growth, Yield, Wheat*

SUB THEME 4: TRANSLATING SDGS AND GLOBAL ISSUES INTO LOCAL ACTIONS TO ADDRESS CLIMATE CHANGE

Translating SDGs and Global Issues into Local Actions to Address Climate Change

Vincent Sudoi

Abstract

The "Global Resources Outlook 2019" emphasizes the crucial role of decoupling resource use from economic growth and human well-being in achieving the Sustainable Development Goals (SDGs). The report suggests that through improved resource productivity and shifts in global consumption patterns, decoupling is possible, resulting in environmental, social, and economic benefits. Land, as a critical and limited resource, is central to this process. The inefficient and inappropriate use of land leads to degradation, which has severe consequences for both human well-being and Earth's ecosystems. This think piece explores solutions for land stewardship through restoration and rehabilitation, highlighting their significant role in achieving multiple SDGs. Restoration efforts, though challenging, are essential for maintaining ecosystem functionality and ensuring sustainable human well-being. The report underscores the interconnectedness of land management with SDGs, advocating for a landscape approach to restoration that balances risks, trade-offs, and opportunities across various global and local contexts.

Keywords: *SDGs, Local action, climate change*

Seasonal Climatic Changes Drive Variation in Selected Soil

P.J.K. Rongoei

Abstract

Globally and locally, there is strong consensus on why the Sustainable Development Goals (SDGs) are essential for sustainability. However, despite the strong consensus on the "why question," many gaps and challenges remain on the "how question" – in other words, how to deploy innovations and solutions to achieve sustainability rapidly and at scale. In this paper, we will argue that entrepreneurship is the answer to the how question for SDGs to be delivered rapidly, sustainably, and at scale, both

locally and globally. Using case study approach and focusing on youth entrepreneurs in Kenya, this paper will explore the link between youth entrepreneurship and sustainability. Through the lens of solar technology, the study seeks to demonstrate how entrepreneurship training and mentorship for the youth can contribute to multiple SDGs including reducing poverty and hunger, improving public health, increasing access to affordable and clean energy, and leveraging partnerships.

Keywords: *Climate change, soil SDGs*

SUB THEME 5: WASTE AND POLLUTION CONTROL

Ion Exchange Properties of Onion Skin and Orange Mesocarp: A Sustainable Approach to Metal Ion Removal **from Aqueous Solutions**

Sampson Kofi Kyei

Abstract

Onion Skin (OS) and Orange Mesocarp (OM) are agricultural wastes of public health concern if allowed to accumulate in the environment. Pollutants in industrial wastewater and waterbodies pose significant threats to the natural environment and human culture. These pollutants, often, include heavy metals, and organic and inorganic compounds. Recently, the valorization of agricultural wastes has surged due to their potential value in several industries. Orange mesocarp, onion skin extracts and their derivatives have ion exchange properties that can be harnessed for the removal of metal ions from wastewaters and aqueous solutions. The functional groups of the extracts and their derivatives allow ion exchange capability through mechanisms involving resin and solution ion exchange. Pollutant removal efficiency in wastewater treatment, heavy metal remediation and oilfield chemistry applications depends on factors such as pH, particle size, temperature, and agitation time. This review employs a multidisciplinary approach to comprehensively understand how to treat wastewater using onion skin, orange mesocarp extracts and their derivatives. An understanding of the factors that influence the effectiveness of the metal ion removal process and the mechanisms will enhance the development of more effective bio based materials for the removal of pollutants from wastewaters, as well as facilitating the translation of laboratory findings into industrial applications, thereby making

onion skin and orange mesocarp derivatives suitable substitutes for petroleum-based conventional ion exchangers in line with value addition and sustainability principles.

Keywords: *Onion Skin, Orange Mesocarp, wastes, pollutants, ion removal*

Towards a Circular Economy -Policy & Legal Framework Guiding Waste Management in Kenya

Catherine Mbaisi

Abstract

The Paper provides a comprehensive overview of Kenya's approach to sustainable waste management. The presentation underscores the escalating waste generation in Kenya, exacerbated by rapid urbanization, and its adverse impacts on environmental health and climate change.

It highlights the importance of adopting a circular economy model to enhance resource efficiency, reduce environmental degradation, and contribute to the achievement of the Sustainable Development Goals (SDGs). Existing policies and legal frameworks in Kenya are outlined and they include include the Constitution of Kenya, the National Environment Policy 2013, and the Sustainable Waste Management Act 2022, which collectively aim to transition waste management from a linear to a circular economy.

The presentation also covers international and regional agreements, such as the Basel Convention and the African Ministerial Conference on Environment (AMCEN), that Kenya has domesticated into its national policies. Additionally, it discusses the Extended Producer Responsibility (EPR) regulations, which hold producers accountable for the entire lifecycle of their products, promoting waste reduction, reuse, and recycling.

Key initiatives like Material Recovery Facilities (MRFs) and the national color-coding system for waste segregation are also addressed as crucial components of Kenya's strategy to manage waste sustainably. The presentation concludes by emphasizing the collective responsibility of various stakeholders, including government entities, private sectors, and the public, in achieving the vision of a zero-waste society by 2030.

Keywords: *Extended producer responsibility, Material recovery facility, Colour codes*

Derivatives of Red Onion Skin Extract as Green Scale Inhibitors

William Iheanyi Eke

Abstract

Scale formation is a serious problem in many industries including water treatment and desalination plants, power generation plants and the oil and gas industry. If not properly managed, scaling can lead to operational inefficiency and equipment damage resulting in unacceptably high OPEX. Use of scale inhibitors is a popular mitigative approach due to its flexibility, reliability and relative cost-effectiveness. However, the cost and eco-toxicity of many traditional scale inhibitors and increasing environmental awareness has created the need to develop more eco-sustainable alternatives (green scale inhibitors). In this study, a biomass-based scale inhibitor (SI) was prepared by chemical derivatization of red onion skin extract (ROSE) with glutaraldehyde. The inhibition efficiency of the glutaraldehyde-ROSE resin (ROG) was evaluated in synthetic brines containing CaSO4, BaSO4, and CaCO3 under static conditions according to NACE standard methods. The formulated scale inhibitor was compatible with the brine and thermally stable. The inhibition studies of ROG revealed optimal inhibition of 89.18% at 80 ppm and 57.72% at 100 ppm at 90 °C and 22 hrs, respectively, for BaSO4 and CaCO3 scales, while for CaSO4 scales, optimal inhibition of 66.94% was observed at 100 ppm, 71 °C, and 22 hrs. In comparison, the commercial scale inhibitor (CSI) showed optimal inhibition of 96.83% at 100 ppm and 94.04% at 80 ppm at 71 °C and 22 hrs, respectively, for BaSO4 and CaSO4 scales, while for CaCO3 scales, optimal inhibition of 98.36% was observed at 80 ppm, 90 °C, and 22 hrs, respectively. ROG efficiently inhibited the formation of CaSO4, BaSO4, and to some reasonable extent, CaCO3 scales. Although the inhibition efficiency of ROG was lower than CSI, the findings highlight the huge potential of red onion skin extract and its derivatives as sustainable scale inhibitors.

Keywords: *Red onion skin extract, scale inhibitors, derivatives*

Fluoride Levels in Sediments, Springs and River Water in the Upper River Njoro

Jacob Kiptoo Sanga

Abstract

Water is vital for life, but quality issues affect its suitability for consumption. In 2020, 2 billion people lacked safe water services. Fluoride in water can be beneficial or harmful; WHO advises a maximum of 1.5 mg/L to prevent health risks. Globally, fluoride contamination is a problem, especially in India, China, and Africa. In Kenya Rift Valley, high fluoride levels cause dental fluorosis. This study examines fluoride levels in the Njoro catchment, Nakuru County, Kenya. In the River Njoro catchment, water sources have varying fluoride levels, posing risks of skeletal and dental issues. The study assessed fluoride levels in sediments, springs, and river water in the upper River Njoro catchment. This study assessed fluoride levels in the upper River Njoro catchment area, spanning from Nessuit upstream to Tumaini Bridge downstream. A longitudinal survey design was utilized, incorporating stratified sampling across upper, middle, and lower catchments. Samples were collected from fifteen sites, including river water, spring water, and sediment, during both dry and wet seasons. The samples were analyzed at the University of Eldoret for fluoride and physical-chemical parameters. The samples were collected in triplicate, with physical-chemical measurements taken in situ and fluoride concentrations determined using ion-selective electrodes. Sediment samples were collected and processed following standardized methods. Statistical analysis using Genstat software, involved ANOVA and correlation statistics to identify significant differences and relationships between fluoride levels and physicalchemical parameters. River water fluoride concentrations ranged from 0.38 to 1.77 mg/L, with the highest mean at site S8. River sediments showed fluoride levels between 0.50 and 2.91 mg/kg, with higher concentrations in lower strata. Spring water fluoride ranged from 1.20 to2.44 mg/L, while spring sediments had levels from 0.77 to 1.55 mg/kg. This study highlighted significant variations in fluoride levels across river and spring waters in the upper River Njoro catchment, with some sites exceeding WHO standards. The study emphasized the need for ongoing monitoring to inform on safe water quality and maintain public health. Recommendations included investigating high fluoride sites, prioritizing compliant spring water, and focusing future research on the causes of elevated fluoride levels and groundwater flow patterns.

Keywords: *Fluoride, River Njoro catchment, WHO standards, sediments, springs, water*

Innovative Digital Solutions for Plastic Waste Management: Youth Perspectives and Engagement

Adeolu Odusote

Abstract

This paper presents the learning takeaways of a project of Digital Peers International (DPI), an organisation in the Pearls Learning Hub (PLH), Abuja, Nigeria, sponsored by the Small Grant Program (SGP-GEF-UNDP), done in 2023. The project aimed to develop and implement digital solutions for plastic waste management from the perspective of youth. The project primary objective was to design, test, and deploy digital applications that promote optimal plastic use, reduction, and efficient waste management practices among and in the communities of young people. The project employed a participatory approach, engaging youth in the design, development, and testing of digital solutions. We conducted surveys, focus groups, and cocreation workshops with IT-engaged youth, aged 18-35 years, to understand their perspectives on plastic use and waste management. The youth then developed and tested digital solutions, including mobile apps, social media campaigns, and online platforms. Our research revealed that youth are concerned about plastic waste management but lack awareness and engagement opportunities. The project's digital solutions included: providing education and awareness on optimal plastic use and waste reduction, encouraging youth-led initiatives and community engagement, offering incentives and rewards for sustainable practices, and facilitating feedback and suggestions for improvement. The project demonstrated significant impact in engaging youth in plastic waste management and promoting sustainable practices. Key outcomes include: 40% increase in youth engagement in plastic waste management activities, 25% reduction in plastic use among youth app users, 20% increase in waste recycling rates among youth participants, positive behavioral change among youth, with 90% reporting increased awareness and motivation to adopt sustainable practices. This project showcases the potential of digital innovation in engaging youth in plastic waste management. Our solutions demonstrate scalability, replicability, and impact, offering a model for future initiatives. We recommend further development and deployment of digital solutions to optimize plastic use and waste management practices among youth globally.

Keywords: *Plastic wastes, management, youth, engagement*

SUB THEME 6: ROLE OF RCE IN ADDRESSING BIODIVERSITY LOSS

Plastic Pollution Along the Shores of Lake Victoria, Nyamagana District, Mwanza

Neema Mafimbo

Abstract

Plastics are among the most used product in Tanzania and Africa at large, this is because of easy processing and recycling. They are significant sources of pollution and pose a significant Human health risk and the aquatic organisms. The section of Lake Victoria around Nyamagana in Mwanza Region contributes to a large percent of the lake in the East African and supports about 80% of population who practice agriculture and fishing. Plastics are made of harmful and toxic substances like polythene, polypropylene (PP). Potential health risks associated with plastic pollution has gained attention from global movements including public health practitioners, planetary health and other global alliances regarding human-environment safety. It is projected that in about 20 years to come, aquatic plastic pollution would cause a huge loss of aquatic biodiversity and reduces water quality below acceptably potable standards. The aim of the study was to assess the plastic pollution status, plastic pollution health risks and implementation of plastic pollution control measures including information dissemination to the community and establishment of collection bins around the riparian. This project concluded that there is a dare need for establishment of organizations or cooperation with the government to ensure proper plastics control measures are implemented as well as proper disposal or alternatives to plastics so as to conserve the environment for the both present and future generations.

Keywords: *Plastic pollution, shores, Lake Victoria, health risks*

Occurrence, Spatiotemporal Variations and Ecological Risks of Contaminants of Emerging Concern in Selected Rivers in Western Kenya

Chepchirchir Ruth

Abstract

The presence of contaminants of emerging concern (CECs) is continuously growing in water sources making it a difficult to achieve and maintain good water quality status. The existence of these CECs in rivers pose detrimental effects on aquatic organisms and human health. However, data on the occurrence and risk assessment of CECs in rivers is limited from the western Kenya region. Therefore, this study aimed at evaluating the occurrences, spatiotemporal variations and ecological risks of CECs in selected rivers in western Kenya. The specific objectives were to characterize the occurrence of CECs in rivers, access the spatiotemporal variations of CECs in rivers and perform risk assessments of CECs in rivers. The study sites were selected based on the land use practiced in the area. This was in two categories: agricultural land use based on dominant crops planted (maize, wheat, flowers, rice and tea) and urban land use. Water samples (350 mL and 1 mL) were collected from upstream and downstream locations during wet and dry seasons. The 350 mL samples were filtered and underwent solid phase extraction before analysis. Both sample types were analyzed using liquid chromatography coupled with high-resolution mass spectrometry, targeting 785 compounds. Based on the analyte concentrations, risk assessment and prioritization were done using the toxic unit's approach. A total of 333 compounds were detected in the wet season and 363 in the dry season. The most frequently detected compounds were pesticides, industrial compounds, and pharmaceuticals, which also had the highest cumulative concentrations in both seasons. The compounds that were found in high concentrations included: saccharin (9.9 µg/L), metformin (7.5 µg/L) and oxypurinol (6.5 µg/L) in wet season while 2,7-naphthalenedisulfonic acid (40 µg/L), saccharin (25.8 µg/L) and 2,3-epoxypropyltrimethylammonium (18.6 µg/L) had high concentration in dry season. Spatial-temporal analysis showed elevated sum concentration in dry season for pesticides, pharmaceuticals and industrial compounds. The concentrations obtained for 36 pesticides and 15 pesticides in dry and wet seasons respectively, exceeded the water quality threshold for human consumption (100 ng/L). Fluconazole exceeded the predicted no-effect threshold for antifungal resistance (250 ng/L) with concentrations up to 922 and 306 ng/L in dry and wet season respectively. Crustaceans showed to

have highest potential for toxicity, driven by diazinon and dichlorvos in both seasons with Toxicity Unit (TU) up to 5.4 and 2.3 respectively. Diuron was responsible for driving the risk for algae in both season with TU up to 0.1 whereas the risk for fish was substantially low. Based on the overall risk index diazinon and diuron toxicity towards crustaceans and algae respectively were prioritized for monitoring in both seasons. In conclusion the dry season recorded high concentrations of CECs with a river in maize plantation being the hotspot of contamination. This study recommends continuous monitoring of CECs and the development of policies to regulate pesticide use near rivers to mitigate contamination and protect aquatic ecosystems.

Keywords*: Occurrence, risk assessment, CECs, rivers, spatiotemporal variations*

Demystifying Climate Finance: Building Locally Led Innovative Solutions with Communities

Hosea K. Kandagor

Abstract

The Climate Crisis is already affecting people's lives and livelihoods and more so food production systems. Reforming our means of food production is an urgent call and shifting to climate resilient sustainable agricultural practices is topmost priority. The HLPE 2019 prioritized Agroecology as one of the global pathways for a climate resilient food secure future. The current condition of agroecology financing in Kenya is examined in this study along with the creativeness of Community Savings and Lending Associations and their potential to decolonize and unlock Climate Finance for Agroecology. There is a clear consensus and urgency to transform our current conventional food systems, which are highly vulnerable to crises, ranging from the most recent Covid-19 pandemic to the ever-evolving climate change, according to a review of the existing literature and interviews with women farmers transitioning to agroecological practices in Isiolo, Baringo, Makueni, Kajiado, and Laikipia Counties, community-based stakeholders, government, and nongovernmental organizations. There is a huge and growing interest in agroecology because it offers a path toward changing the current fossil fuel based, synthetic agro-chemical intensive, unjust food systems. Shift to agroecological practices continue to be financially constrained by colonialistic climate finance schemes that are overly bureaucratic and out of reach by the small-scale farmers. Increased funding for innovative agroecological and regenerative enterprises driven by locally led financial frameworks combined with credible innovative solutions that are people led is sustainable and builds a thriving community and nature.

Keywords: *Climate change, finance, communities, innovative solutions*

Integrated Strategies in Cubing Biodiversity Loss and Climate Change

Wanjohi Lucy and Kosgei Janet

Abstract

Biodiversity loss throughout the world keeps on escalating at an alarming rate majorly due to human activities, such as change in land use, pollution, habitat degradation and climate change. Scientists have recently warned that one million species out of an estimated total of eight million are threatened with extinction, many within decades. Some researchers even consider that we are in the middle of the sixth mass extinction event in earth's history. Extinction of species is permanent, threatening ecosystems and the provision of ecosystem goods and services, and posing a threat to human well-being and survival. It is impossible to know exactly what the consequences of mass extinctions would be for humanity. Thus now, more than ever, there is need to urgently take the concrete action needed to fight and contain this threat before it is too late to curb this problem. Biodiversity provides us with ecosystem goods and services. It helps us fight climate change and adapt to it as well as reduce the impact of natural hazards. Biodiversity makes a positive contribution to human health, whereas up to eighty percent of the medicines used by humans are of natural origin. This calls for urgently action to protect nature and conserve biodiversity. Available evidence suggests that it is not too late to halt and reverse current trends in the decline of biodiversity, however, this will require substantial changes whereas human activities should respect planetary boundaries. Thus, this paper is vital as it comprehensively reviews' publications and provides summarized information of the proposed methods and future prospects in mitigating and curbing biodiversity loss.

Keywords: *Biodiversity loss, climate change, extinction, Ecosystems*

Development of Low Cost, Efficient Water Purification System for Use in Resource Constraint Areas

Ilyas Muhammad

Abstract

Access to clean drinking water remains a significant challenge in many rural regions worldwide, where conventional water treatment systems are often unavailable or unaffordable. This project aims to address this issue by developing a low-cost, efficient water purification system specifically designed for use in remote and resource-constrained areas. The proposed system combines solar-powered ultraviolet (UV) purification with ceramic filtration to effectively remove biological contaminants and particulates from water, ensuring its safety for human consumption. The process of design included a great deal of study into reasonably priced materials and energy-saving technologies in order to develop a durable and simple-to-maintain purification machine. The main parts of the system are a ceramic filter, a UV purification chamber, and a solar panel, all of which are contained in a sturdy, transportable frame. The UV lamp, which is powered by the solar panel, inactivates hazardous germs, while the ceramic filter physically filters out suspended particles and pathogens. To assess the system's functionality in actual rural environments, field experiments were carried out. Before and after treatment, water samples from nearby sources were examined to measure things like turbidity, chemical pollutants, and microbiological load. The outcomes showed that the system successfully decreased turbidity to satisfy international drinking water standards and dramatically decreased microbial contamination, attaining a 99.99% reduction in bacteria and viruses. The system's solar-powered architecture also guarantees cost-effectiveness and sustainability by doing away with the requirement for external power sources and cutting operating expenses. Because the components are widely available and reasonably priced, rural populations can afford and utilize the system. The system requires little maintenance, and local users can run it with ease without any specific training. The results of this project Indicate that the designed water filtration system can offer a scalable and long-lasting solution to the issue of contaminated drinking water in rural areas. The system has the potential to minimize waterborne infections, improve public health, and improve the general well-being of rural populations by increasing access to clean water.

Keywords: *Water purification, low cost, drinking water*

Empowering Youth for Sustainable Climate Action: Catalyzing Local Innovations through Education for **Sustainable Development**

Kipkogei Justus

Abstract

The youth stand at the forefront of climate action, possessing the potential to drive meaningful change through innovative solutions and dynamic leadership. This presentation delves into the critical role of youth in advancing climate action, underpinned by the principles of Education for Sustainable Development (ESD) and aligned with the Sustainable Development Goals (SDGs). As the generation that will inherit the consequences of today's environmental decisions, youth have both the motivation and the creativity needed to address the pressing challenges of climate change. This discussion highlights the importance of integrating youth into climate strategies, where their unique perspectives and energy can be harnessed to catalyze local innovations and transform communities. The presentation will showcase a series of successful youth-led initiatives that have effectively contributed to environmental sustainability, particularly in the areas of biodiversity conservation, waste management, and climate-resilient agriculture. These examples will demonstrate how young leaders, when equipped with the right knowledge and tools through ESD, can drive impactful actions that resonate at both local and global levels. Moreover, the presentation will explore the pivotal role of Regional Centres of Expertise (RCEs) as enablers of youth engagement. RCEs serve as vital platforms for fostering partnerships between youth, communities, and other stakeholders, facilitating the exchange of ideas and scaling of successful projects across regions. By emphasizing the need for policies that support youth participation in decision-making and advocating for educational reforms that align with sustainability goals, this presentation argues that empowering youth through ESD is essential not only for achieving the SDGs but also for ensuring the longevity and effectiveness of climate action efforts. In conclusion, this presentation will make the case that youth are not merely participants but leaders in the global movement for sustainability, and that their active engagement is crucial to building a resilient, equitable, and sustainable future.

Keywords: *Climate action, youth, innovations, SDGs, Local*

Influence of BOM budgeting competencies on governance of public primary schools in Mombasa County, Kenya.

Mwanasiti Mbete Mwalimu

Abstract

Ensuring the delivery of quality education in public elementary schools requires effective governance. However, bad governance outcomes including resource mismanagement and disregard for educational policies in public elementary schools have been attributed to the insufficient competences of BOM on multiple occasions. This study was set out to evaluate Influence of BOM budgeting competencies on governance of public primary schools in Mombasa County, Kenya. Resource-based theory served as the study's foundation. It employed a cross-sectional survey with an embedded design of mixed methods and a pragmatist research ethic. The target group consisted of 97 head teachers, 97 BOM chairpersons, and 6 Sub-County Directors of Education from the Ministry of Education. A sample of 200 respondents was taken. The researcher used census method to choose 97 public elementary schools and all the six Sub-County Directors of Education. The study involved participation from all head teachers and BOM chairpersons from the sampled schools. Head teachers and BOM Chairpersons self-administered questionnaires to gather data, while Sub-County Directors of Education were interviewed using a guide. Twenty percent of the target population participated in the questionnaire pilot program in Kilifi County. Cronbach Alpha coefficients were used, with a 0.7 threshold, after content, face, and construct validity were confirmed. Regression analysis, Pearson correlation, mean and standard deviation, and other techniques were employed in the data analysis process, which was aided by SPSS. Tables, figures, themes, and snippets were used to present the results. According to the study, 73% of the differences in governance in public primary schools may be explained by the budgeting competencies. The study concludes that budgeting competencies significantly influence the governance of public primary schools in Mombasa County, Kenya. High mean scores for the overall effect of budgeting on governance and timely budgeting highlight their critical roles in effective school management. This study recommends that the Ministry of Education, in collaboration with the Boards of Management (BoMs) of public primary schools in Mombasa County, should prioritize enhancing budgeting competencies through targeted training programs. These programs should focus on effective budgeting practices to ensure comprehensive financial planning and resource allocation.

Nexus between BOM decision making competencies and governance of public primary schools in Mombasa County, Kenya.

Mwanasiti Mbete Mwalimu

Abstract

Effective governance in public primary schools is crucial for ensuring the delivery of quality education. However, the inadequate competencies among BOM has severally been blamed for poor governance outcomes such as mismanagement of resources and failure to adhere to educational policies in public primary schools. This study evaluated the influence of BOM decision making competencies on governance of public primary schools in Mombasa County, Kenya and further determined the moderating role of BOM demographic characteristics on the relationship between BOM decision making competencies and governance. The study was anchored on stewardship theory. It used a pragmatism research philosophy and a cross-sectional survey with an embedded design of mixed methods. The target population was 97 public primary schools in Mombasa County involving 97 head teachers, 97 chairpersons of the BOM, and six Sub-County Directors of Education from Ministry of education. Two hundred respondents were sampled. The researcher employed census method when selecting all the six Sub-County Directors of Education, and 97 public primary schools. All the BOM chairpersons and head teachers from the sampled schools participated in the study. Data was collected using questionnaires which was self-administered to head teachers and BOM Chairpersons, while interview guide was used on Sub-County Directors of Education. Piloting of the questionnaires was done in Kilifi County using 20% of the target population. construct validity were ensured, while the Cronbach Alpha coefficients with a threshold of 0.7 was applied. Data analysis was done with the help of SPSS, where, mean and standard deviation, Pearson correlation, and regression analysis were used. The findings were presented using tables, figures, themes and excerpts. The study found that decision-making competencies significantly influence the governance of public primary schools, explaining 52.7% of the variations in governance. Additionally, demographic characteristics of BOM members, such as age, education, and gender, play a key moderating role in this relationship. The study concludes that effective governance in Kenyan public primary schools is driven by strategic decision-making, which can be improved through training. Educational qualifications, gender, and age of BOM members are also crucial in enhancing governance. The study recommends targeted training for BOMs in decision-making.

Human Activities and Physical-Chemical Parameters along River Kiminini, Trans-Nzoia County, Kenya

Barasa C. N., Simiyu G.M., Khazenzi J.A

Abstract

Water plays a major role to man and environment. River Kiminini is threatened by human activities like agriculture, deforestation, and animal watering which alters its quality and the biodiversity. The study was therefore done to assess human activities and physical-chemical parameters along River Kiminini. Physical chemical parameters were determined from 10 sampling stations along the river. The physical-chemical parameters were measured *in situ* using multiparameter meter (YSI hydro lab model 650 MDS) and nutrients determined calorimetrically using standard analytical methods. The mean temperature ranged from 17.20±1.92°C to 22.27±0.55°C, total dissolved solids had a mean range of 90±10.00 mg/L to 100 ± 8.16 mg/L, electric conductivity mean ranged from 116.67 ± 22.90 µs/cm to 143.33 ± 28.13 µs/cm , pH mean ranged from 7.65± 0.08 to 8.20 ±0.14, nitrates mean ranged from 8.29± 2.02 mg/L to 14.40 ±2.04 mg/L and phosphates mean ranged from 0.69±0.17mg/L to 1.32 ± 0.56 mg/L. The data analysis was done using R programming language version 4.4.0. ANOVA and Duncan's Multiple Test were used to compare means among stations and sampling periods. The study found that human activities influence the physicochemical parameters of the River Kiminini and therefore recommends controlling riparian land use for improved water and habitat quality.

Integrated Strategies In Cubing Biodiversity Loss And Climate Change

Wanjohi Lucy

Abstract

Biodiversity loss throughout the world keeps on escalating at an alarming rate majorly due to human activities leading to change in land use, pollution, habitat degradation and climate change. Recently, researchers have pointed out that out of an estimated total of eight million, one million species are threatened with extinction, many within decades. Several scientists have warned that we are in the middle of the sixth mass extinction event in earth's history. Extinction of species is irreparable, threatening

provision of ecosystem goods and services, and posing a threat to human well-being and survival. It is impractical to precisely specify what the impacts of mass extinctions would be for humanity. Thus now, more than ever, there is need to urgently take the concrete action needed to fight and contain this threat before it is too late. Biodiversity provides us with ecosystem goods and services. It aids in climate change mitigation and adaptation as well as reduce the impact of natural hazards. Biodiversity contributes positively to human health, whereas up to eighty percent of the pharmaceuticals used by man are of natural origin. This calls for an urgent action to protect nature and conserve biodiversity. Available evidence implies that it is not too late to stop and reverse current trends in the biodiversity decline, however, this will require substantial changes whereas human activities should respect planetary boundaries. Thus, this paper is vital as it comprehensively reviews' publications and provides summarized information of the proposed strategies and future plans in mitigating and curbing biodiversity loss.

Key words

Biodiversity loss, climate change, extinction, ecosystems.

PHOTOS

Plate 1: Kapcherop tea Estate, Elgeyo Marakwet County
Photo credit: ***photographer, Evans Kiplagat Moi***

Plate 1: Kapcherop Tea Estate, Elgeyo Marakwet County

Plate 2: View of Keiyo Escarpment.
Photo credit: ***Photographer, Evans Kiplagat Moi***

Plate 3: Lake Bogoria, Kapicha View Point
Photo credit: ***photographer, Titus Ngetuny***

Plate 4: Photo of a section of the Rift Valley, from Iten View Point
Photo credit: ***Photographer, Evans Kiplagat Moi***

Plate 5: Photo of a section of the Rift Valley escarpment, from Iten View Point
Photo credit: ***Photographer, Evans Kiplagat Moi***

Plate 6: Photo of a section of the Rift Valley Lake Kamnarok, from Iten View Point
Photo credit: ***Photographer, Evans Kiplagat Moi***

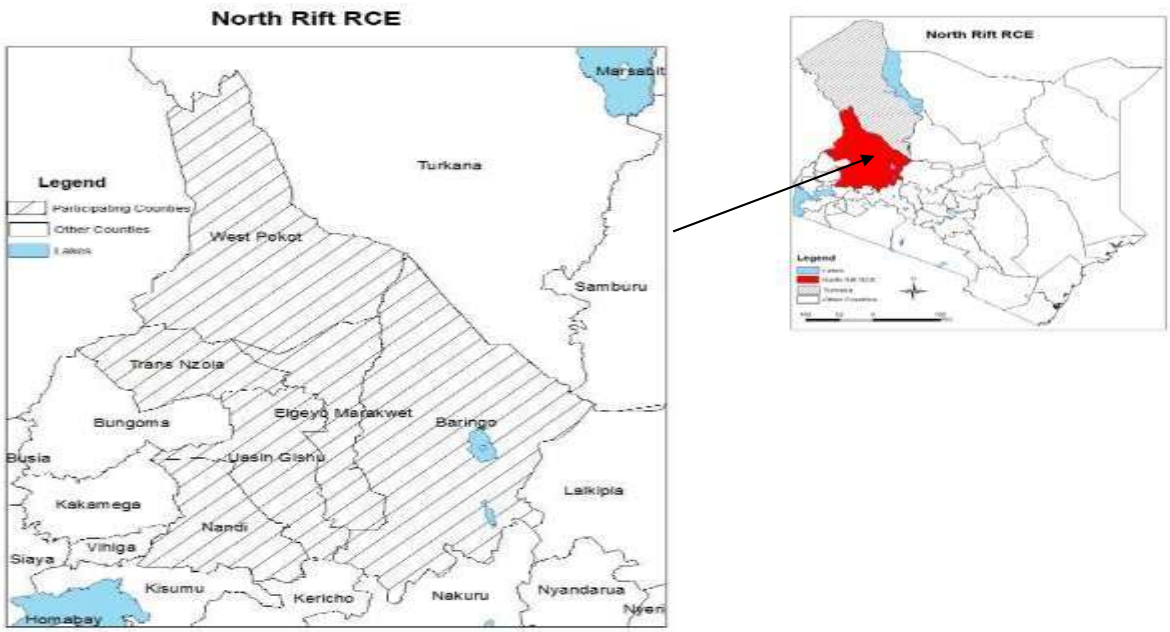

Figure 1: Maps indicating the five (5) counties under the operations of RCE North Rift.

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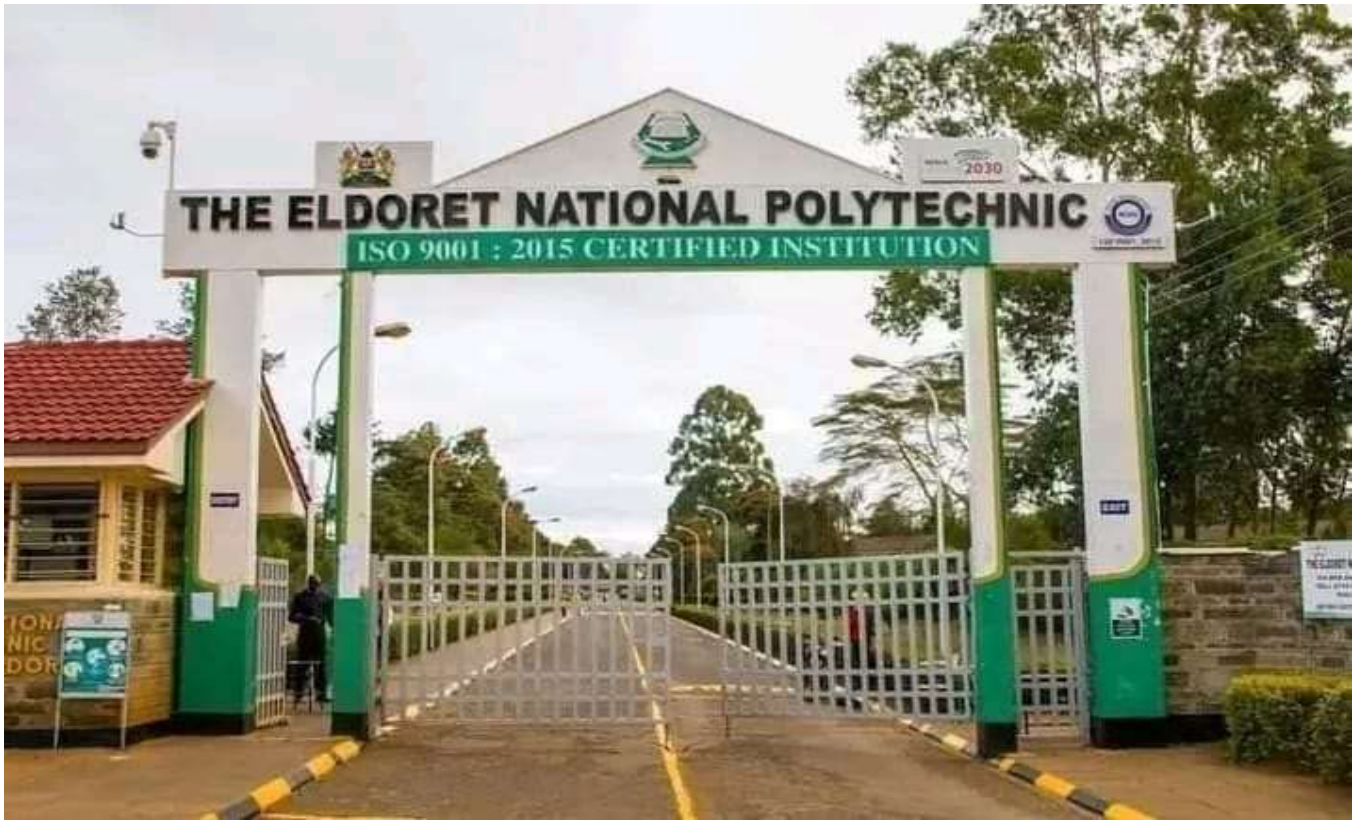

Photo credit: *Photographer: Kennedy Mutai*

Traditional dancers. Nort Rift Harbalists.

14th Africa Regional meeting Local organizing committee.

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