

CHUKA



UNIVERSITY

Knowledge is Wealth/Akili ni Mali (Sapientia divitia est)

4th International Research Conference

Theme: "Harnessing Environmental Conservation and Renewable Energy Innovations for Sustainable Development"



Strengthening Agriculture to Conserve the Environment and Develop Renewable Energy



Deployment of Quality Education and Health for Environmental Conservation and Renewable Energy Development



Application of Science, Engineering and Technology in Environmental Conservation and Renewable Energy Development



Linking Arts, Humanities and Social Sciences to Environmental Conservation and Renewable Energy Development

Esteemed Collaborators



Utilization of Biodiversity to Conserve the Environment and Develop Renewable Energy



Proceedings

18th to 20th October, 2017

Chuka University is ISO 9001:2008 Certified



Inspiring Environmental Conservation for Better Life

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Knowledge is Wealth/Akili ni Mali (Sapientia divitia est)

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Motto: Knowledge is Wealth/Akili ni Mali (*Sapientia divitia est*)

Slogan: Inspiring Environmental Sustainability for Better Life

Philosophy: Quality education, training, research, extension, environmental sustainability, and entrepreneurship lead to social cohesion, human integrity, and economic development

Vision: A Premier University for the provision of quality education, training and research for sustainable national and global development

Mission: To provide access, generate, preserve and share knowledge for quality, effective and ethical leadership in higher education, training, research and outreach through nurturing an intellectual culture that integrates theory with practice, innovation and entrepreneurship.

CORE VALUES

- (1) Customer Value and Focus
- (2) Diversity and Social Fairness
- (3) Environmental Consciousness
- (4) Fidelity to the Law
- (5) Innovation
- (6) Integrity
- (7) Passion for Excellence
- (8) Peaceful Co-Existence
- (9) Professionalism and Confidentiality
- (10) Prudent Utilisation of Resources
- (11) Teamwork
- (12) Timeliness and Devotion to Duty

DISCLAIMER

Views expressed in the abstracts published in these proceedings are those of contributing authors and do not in any way represent views of Chuka University, Division of Academic, Research and Student Affairs, or Board of Research, Extension and Publications. The organisers reserved the right to format the papers to meet required standards.

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PREFACE

Chuka University became the 2nd Chartered and 9th Full-Fledged Public University in Kenya in 2013. It is located in Chuka Town in Tharaka-Nithi County at 186 km from Nairobi City along the Nairobi-Meru Highway. Chuka University has triple core Missions of Education, Research and Extension. The University strengthened and sustained these core missions by hosting the 4th International Research Conference. The theme of this Conference was “Harnessing Environmental Conservation and Renewable Energy Innovations for Sustainable Development”. The subthemes were: Strengthening agriculture to conserve the environment and develop renewable energy; Deployment of quality education and health for environmental conservation and renewable energy development; Application of science, engineering and technology in environmental conservation and renewable energy development; Linking arts, humanities and social sciences to environmental conservation and renewable energy development; Mainstreaming affirmative action and gender equity in environmental conservation and renewable energy development; and Utilization of biodiversity to conserve the environment and develop renewable energy.

The objectives of the Conference were to disseminate and share current knowledge, innovations and technologies to spur sustainable development, bring students, researchers, scholars, professionals and policy makers together to interact and network, facilitate interested parties and stakeholders to acquire and exhibit the new knowledge, technologies and capacities, and provide a forum for students, researchers and industrialists to take their creations and innovations to the next level.

The theme was anchored in the Chuka University’s higher education, research and extension niche area and the 17 UN Sustainable Development Goals (SDGs) that countries will be expected to use to frame their agendas and policies until 2030 in an ecologically sound manner. The SDGs framework contains a number of conceptual as well as implementation challenges that require enhancing collaboration among scholars, policy makers and other professionals to overcome. Coincidentally, the theme was topical as it coincided with when Kenya resolutely decided to tame plastic bags that had in the past contributed immensely to environmental pollution. In this theme, all disciplines were applicable, owing to the fact that the environment is where everything operates and energy is an essential utility we cannot do without as human beings. Additionally, dialogue on this theme should help us contribute to finding solutions to mitigate the harsh climate change effects; for instance, through exploitation of renewable energy resources. Environmental conservation and renewable energy innovations play important roles in sustainable development through prudent resource utilization and guarding against associated risks. The Conference was coined to exemplify the roles Environmental Conservation and Renewable Energy innovations can play in the realisation of Sustainable Development.

Ultimately, the over 125 abstracts and posters received were presented, disseminated and shared during the Conference. It was hoped that the conference would meet objectives and expectations of participants. Sincere gratitude went to all scholars, researchers, authors and stakeholders who had interpreted and contributed relevantly to theme of the conference in one way or another. Gratitude went to the Vice-Chancellor, Prof. Erastus Njoka, for being at the forefront of championing the conferences. Similarly, our esteemed partners were acknowledged for facilitating the Conference. Last but not least, the invaluable support received from Chuka University staff during the conference and book of abstracts organization and compilation was appreciated.

Professor Dorcas K. Isutsa, Ph.D.

Deputy Vice-Chancellor (Academic, Research & Student Affairs)

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