

CHUKA



UNIVERSITY

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

6th International Research Conference

Theme: "Leveraging Entrepreneurial Research and Education for Sustainable Development"



Esteemed Collaborators



United Nations
Educational, Scientific and
Cultural Organization



Kenya National
Commission for UNESCO
(KNATCOM)



Proceedings

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Inspiring Environmental Conservation for Better Life

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

**Proceedings of the 6th International Research Conference held on
the Main Campus from 6th – 8th November, 2019**

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CHUKA UNIVERSITY FUNDAMENTAL STATEMENTS

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

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PREFACE

Chuka University is the 9th Chartered Public University in Kenya. It organised the 6th Cycle of these Annual International Research Conferences, whose theme was: “**Leveraging Entrepreneurial Research and Education for Sustainable Development**”. The Conference theme was in line with contemporary times that require turning research and education milestones into enterprises for solving recalcitrant societal problems for healthy, secure and wealthy livelihoods. It contributed to the realization of the Kenya Vision 2030, UN Sustainable Development Goals and Global Economic Agenda blueprints such as Education for Sustainable Development, and Global Citizen Education. Together with the subthemes, it aspired to link scholars, researchers, industrialists and policy-makers to establish firm partnerships for exponential development.

The Organizers set six subthemes for the Conference. These were: Enterprising Agriculture and Environmental Management; Enterprising Hospitality and Business Management; Enterprising Education and Training Competencies; Enterprising Arts, Humanities and Social Sciences; Enterprising Natural Sciences, Engineering and Technology; and Enterprising Health Sciences and Affirmative Actions.

The objectives included: Dissemination and sharing of current knowledge, innovations and technologies for social upgrading; Bring academia and industry players together to uptake contemporary knowledge for policy setting; Facilitation of industrialists and academia to identify and showcase research milestones for economic transformation; Provision of a forum for stakeholders to interrogate entrepreneurship potential of generated research milestones.

We subsequently received abstracts from over 250 delegates from Kenya and beyond, comprising academicians, policy makers, researchers, industry players, NGOs, CBOs, among others, from both public and private sectors. Almost all Universities in Kenya were represented in this Conference either through direct entry or collaboration. Similarly, many allied institutions were represented. We had a host of exhibitors participating through showcasing of their products, or presenting posters of their latest discoveries and works. For the first time, a huge number of administrative and technical staff members have entered abstracts. It seems the saying that “publish or perish” has finally caught up with them. We therefore urge them to keep it up.

We were truly grateful to all delegates who responded positively and immensely to our invitation. They listened in plenary sessions of their choice. Networking and exhibition sessions proceeded continuously during health breaks. The organizers invited several key lead speakers from pertinent industry sectors to curtain-raise the various breaker sections. The Conference ended with an excursion to a model incubation research centre and national heritage keeper of Kenya.

We packaged full manuscripts submitted into these proceedings and shall upgrade selected highest quality ones for review and publication in the Chuka University Journal for Environmental Sustainability Enhancement Research (JESAR).

We hope you shall find these proceedings informative and that you shall enjoy perusing them. Kindly leave us feedback that can help us improve on future proceedings.

Professor Dorcas K. Isutsa, Ph.D.

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

KEY NOTE ADDRESS BY THE SECRETARY GENERAL/CEO FOR KENYA NATIONAL COMMISSION FOR UNESCO (KNATCOM), DR. EVANGELINE NJOKA, MBS, DURING THE 6TH INTERNATIONAL CONFERENCE OF CHUKA UNIVERSITY, 6TH NOVEMBER 2019

ROLES OF UNIVERSITIES IN IMPLEMENTATION OF THE SUSTAINABLE DEVELOPMENT GOALS

The Vice-Chancellor of Chuka University Prof. Erastus Njoka, Deputy Vice Chancellors, Chuka University, University Staff, Conference participants, Students, Ladies and Gentlemen, Good morning.

I am delighted to join you today during the opening of the 6th International Conference whose theme is “Leveraging Entrepreneurial Research and Education for Sustainable Development”. Allow me to take this earliest opportunity to wish you a very fruitful conference with concrete deliverables towards promoting quality education in Kenya.

Ladies and Gentlemen,

As you are aware, UNESCO was established in 1945 after the Second World War with the aim of contributing to peace and security in the world, based on the premise that “**since wars begin in the minds of men and women, it is in the minds of men and women that the defenses of peace must be constructed**”. These words no doubt, make it clear that following the war, mankind was forced to reflect on the nature of war and peace. UNESCO is the only UN body with a mandate of Education from ECDE through Universities. Kenya became a member of UNESCO in 1964 and KNATCOM was established in the same year and was placed under the Ministry of Education. In January, 2013 KNATCOM became a State Corporation through the enactment of the Kenya National Commission for UNESCO Act 2013.

The Commission derives its mandate from the UNESCO Constitution, Charter of the National Commissions for UNESCO and the Kenya National Commission for UNESCO Act 2013. As a State Corporation with international visibility, KNATCOM is the principal link between the national priorities of Kenya and the multilateral agenda of UNESCO. KNATCOM has five main programmes, in line with UNESCO’s areas of competence, these are; Education, Natural Science, Social and Human Science, Culture and Communication & Information. These programmes are supported by specific programme and expert committees drawn from relevant ministries, government agencies, academia and private sector.

Ladies and Gentlemen,

In 2015, the United Nations adopted the Global 2030 Sustainable Development Agenda and proposed 17 Goals with 169 targets covering a broad range of sustainable development issues. These included ending poverty and hunger, improving health and education, making cities more sustainable, combating climate change, and protecting oceans and forests. Education is emphasized not only in goal 4 but also as one of the key factors for the achievement of all the other SDGs. Later in the same year, UNESCO issued the Education 2030 Framework for Action, which is a roadmap for the implementation of SDG4 -Education 2030. Institutions, should and will make a major contribution to the effective implementation of the Sustainable Development Agenda.

Ladies and Gentlemen,

Development is the process of gradually becoming bigger, better, stronger, or more advanced and is very critical to the growth of any individual, society or nation. It is however, important for any individual, community, society or nation to be able to sustain its level of development. Sustainance, is regarded as the ability to make a thing continue to happen for a long time.

Universities play the leading role in the development sector all over the world. Within the last 80 years the world’s population has increased threefold and will grow by approximately 3.7 billion people in the next 30 years with an estimate that ninety percent of the additional people will live in poor countries. There are risks of reversal of the gains made in the area of development over the last decade or so. As a matter of fact some of the countries are already falling behind target dates for meeting the MDGs. The United Nations and several international agencies and non-governmental organization (NGOs) have raised alarms and issued warnings over the state and conditions of the globe today. However, the fundamental and overriding success factor in the implementation of sustainability development is requisite human capital. According to Al-Roubaie (2013), “the concept of sustainable development is concerned with the management of national resources, including indigenous knowledge systems to balance present and future consumption. For example, non-renewable resources are finite and require adequate management systems capable of

exploiting them in a productive way to prolong their use beyond the present generation. In other words, sustainable development involves processes that link present generations with the future.

In this regard, sustainable development should become a regular part of the programmes and curricula of our educational system at all levels. Education is an instrument for training human resources to optimize productivity by encouraging technical progress and by promoting cultural conditions conducive to social and economic change.

Ladies and Gentlemen,

While Universities are expected to play very specific roles in promoting sustainable development through their traditional functions of teaching, research and knowledge dissemination, there is a growing consensus that our current paradigms are inadequate for addressing the long term needs of a sustainable future. As such, it is then necessary for Universities to fill the gaps by updating strategies and procedures to accommodate the resilience required to progressively adapt to changing physical, historical and social conditions in order to play an active role in shaping a more sustainable future. They have a responsibility of taking care of the society and getting rid of the all the hurdles in the way of sustainable socioeconomic development. As the only UN agency with a mandate in higher education, UNESCO helps develop evidence-based policies in response to new trends and works to make education more inclusive and innovative.

Ladies and Gentlemen,

Leadership has a critical role to play in sustaining the transition to sustainable development, by directing institutions' strategic planning, organizing main capital programmes and leading the institutions' interactions with external stakeholders. Leadership also has a figurative role in manipulating the vision of staff and students about sustainable development. Universities have a great role to play in the realization of Sustainable Development Goals. This role is recognized by many people in the Universities and reflected by several international agreements between institutions to pursue growth related issues. Universities are supposed to support communities on addressing emerging challenges through continuous development based on new knowledge generated. It also helps get the abreast of the universities can institute hands on oriented training and practices which can be utilized for societal transformation.

The third central reason to make Universities a suitable option for taking the leadership in sustainable development is that each University is a combination of a number of different centers and organizations in which any of these centers or organizations can add a significant amount of knowledge and practices to the sectors of the society. One of the major functions of the Universities is taking care of the society and getting rid of the all the hurdles in the way of sustainable socioeconomic development. They are the role models and the public is largely looking forward to these enlightened segments of society to overcome the issues. It is therefore notable that sustainable development has to be an essential component of the policy for the future development of the education sector.

Therefore, Universities are expected to provide leadership, partnership and the much needed networking for the realization of SDGs. The seventeen (17) Sustainable Development Goals (SDGs) were formulated by the United Nations in September, 2015 to ensure sustainable development of the world in social, economic, environmental and political perspectives. The Goals are contained in paragraph 54 of the United Nations Resolution A/RES/70/1 of 25th September, 2015. They include to:

- (1) *End poverty in all its forms everywhere*
- (2) *End hunger, achieve food security and adequate nutrition for all, and promote sustainable agriculture*
- (3) *Attain healthy life for all at all ages*
- (4) *Provide equitable and inclusive quality education and life-long learning opportunities for all*
- (5) *Attain gender equality, empower women and girls everywhere*
- (6) *Secure water and sanitation for all for a sustainable world*
- (7) *Ensure access to affordable, sustainable, and reliable modern energy services for all*
- (8) *Promote strong, inclusive and sustainable economic growth and decent work for all*
- (9) *Promote sustainable industrialization*
- (10) *Reduce inequality within and among countries*
- (11) *Build inclusive, safe and sustainable cities and human settlements*
- (12) *Promote sustainable consumption and production patterns*
- (13) *Promote actions at all levels to address climate change*
- (14) *Attain conservation and sustainable use of marine resources, oceans and seas*

(15) Protect and restore terrestrial ecosystems and halt all biodiversity loss

(16) Achieve peaceful and inclusive societies, rule of law, effective and capable institutions

(17) Strengthen and enhance the means of implementation and global partnership for sustainable development

The Goals are universal in that they embody a shared vision for all nations to progress in a safe, just and sustainable space. The Goals articulate the vision that no country should be left behind and that each country has a responsibility to contribute to the global development agenda.

Ladies and Gentlemen, SDG 4 on Quality Education emphasizes target 4.7 on Education for Sustainable Development as a tool for addressing interlinked objectives such as:

1. **Society:** to increase understanding of social institutions and their role in change and development, to promote social justice, gender equality, human rights, democratic and participatory systems, and health care (including HIV/AIDS).
2. **Environment:** to increase awareness of the resources and fragility of the physical environment, the effects of human activity on the environment, climate change, environmental protection (including water education), and biodiversity.
3. **Economy:** to create sensitivity to the potential and the limits of economic growth, its impact on society and the environment, responsible and sustainable consumption, and rural development.

In addition to reflection in the classroom, schools often conduct community-oriented projects. This does not only serve to improve immediate local needs, but to equip students with the necessary skills to transform oneself and society. ESD is a broad teaching and learning process that encourages an interdisciplinary and holistic approach and promotes critical and creative thinking in the educational process.

Ladies and Gentlemen, the following are some of the challenges of Sustainable Development in Kenya.

1. Societal Challenges

Poor governance, corruption, bigotry towards cultural diversity, ethnic animosity, gender inequality, HIV/AIDS scourge, incidence of malaria, TB & other communicable and non-communicable diseases, Injustice, human rights abuse, all forms of violence and increased insecurity, scolded lifestyles & behaviours, drug and substance abuse, erosion of cultural values & morals etc

2. Environmental Challenges

Loss of biodiversity and forest cover, poor farming methods, land degradation, climate changes and variability, droughts, acute water shortages, poor waste management systems, pollution, natural disasters etc

3. Economic Challenges

Unemployment, poverty, corruption, poor living standards, inadequate investment infrastructure, rural /urban migration, corporate irresponsibility, inefficient & wasteful production systems, lack of accountability, unsustainable utilisation of natural resources, poor economic performance, poor policies, poor governments.

Ladies and Gentlemen, the following are the Values to be promoted for the realisation of SDGs.

1. Respect the earth and life in all its diversity

Recognize that all beings are interdependent and every form of life has value regardless of its worth to human beings and affirm faith in the inherent dignity of all human beings and in the intellectual, artistic, ethical, and spiritual potential of humanity.

2. Care for the community of life with understanding, compassion, and love

Accept that with the right to own, manage, and use natural resources comes the duty to prevent environmental harm and to protect the rights of people and affirm that with increased freedom, knowledge, and power comes increased responsibility to promote the common good.

3. Build democratic societies that are just, participatory, sustainable, and peaceful

Ensure that communities at all levels guarantee human rights and fundamental freedoms and provide everyone an opportunity to realize his or her full potential and promote social and economic justice, enabling all to achieve a secure and meaningful livelihood that is ecologically responsible.

4. Secure Earth's bounty and beauty for present and future generations

Recognize that the freedom of action of each generation is qualified by the needs of future generations and transmit to future generations' values, traditions, and institutions that support the long-term flourishing of Earth's human and ecological communities. www.earthcharter.org

Ladies and Gentlemen,

To fast-track the realisation of the SDGs UNESCO put in place the Global Action Programme(GAP) which focuses on enhancing Education for Sustainable Development. The main priority areas include; advancing

policy, transforming learning and training environments, building capacities of educators and trainers, empowering and mobilizing youth and accelerating sustainable solutions at the local level. In addition the Ministry of Education has developed a Policy on Education for Sustainable Development (ESD) and guidelines for mainstreaming ESD from Basic Education and Universities and a focal point officer.

The State Department of Planning has a whole section dedicated to SDGs implementation by various sectors of the country. Each Sector has a Goal or more to implement. Universities can cut across all the seventeen Goals due to the diversity of Programmes and faculty in them. Every University need to cut out a niche in the implementation of the SDGs. Currently there are coordinated efforts by the department of planning from the Ministry of Education to develop monitoring and evaluation modalities to be able to track the progress of implementation for the SDGs.

It is also imperative to note that the Ministry of Education in collaboration with KNATCOM developed the Guidelines for mainstreaming Education for Sustainable Development(ESD) and Global Citizenships Education.

Ladies and Gentlemen, in this regard, I urge Universities to take the lead in implementing SDGs. This can be done through integration into the academic and non-academic programmes including Research. I wish you the very best as you continue undertaking this noble assignment of implementing SDGs.

Thank you very much and God bless you.

Dr. Evangeline Njoka, Secretary General/CEO,
Kenya National Commission for UNESCO(KNATCOM)

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