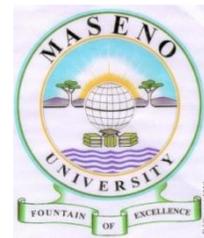


ICSU Regional Implementation Workshop on Sustainable Energy in sub-Saharan Africa

Nairobi, Kenya
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Report

Organiser:



Funded by



Acknowledgements

ICSU would like to thank all participants for taking time off their busy schedules to attend the workshop as well as for their valuable contributions during the two-day event.

We also would like to express our sincere gratitude and appreciation to the Maseno University for the organisational and logistical support rendered prior and during the workshop. Special mention would go to Prof Herick Othieno, who was the meeting chair for the two days and Dr Chrispin Kowenje who successfully and efficiently led the local organising committee of this workshop.

ICSU would especially like to acknowledge and thank the Swedish International Development Agency (Sida) for the financial support that made this workshop possible, as part of the 20-month grant to ICSU.

Background information

Energy is one of the critical factors for sustainable socio-economic development of any nation. In Africa, like in other developing regions of the globe, the energy demand is continuously growing. This challenge offers an excellent opportunity for exploring new avenues that would improve efficient energy production, distribution, storage and use on the continent.

Developing countries, especially those in the sub-Saharan region, are way behind the world's average per capita energy consumption, and have very low indices of electricity coverage. Many countries currently lack adequate and fully developed energy infrastructure, which is crucial for the provision of the foundation for developing energy sustainability. Effective energy production, management and planning on the continent are difficult due to lack of reliable data on energy demand, production and distribution; limited access to sustainable modern energy sources and technologies; absence of a strategy for coordinating the development of energy plans at institutional, national and regional levels; inefficient mechanisms to tap (by energy stakeholders in the region) into the knowledge available from other parts of the globe; lack of critical mass of skilled energy scientists and technologists as well as regional networking for effective collaboration on sustainable energy research.

Although ICSU does not have a sustainable energy programme/initiative at global level, all the three ICSU Regional Offices have identified sustainable energy as one of the priority research areas in the respective regions. As a result, each of the Regional Offices has independently published a science plan on sustainable energy and currently, the Offices have active sustainable energy research implementation plans. As part of efforts by ICSU to come up with an integrated approach that would boost sustainable energy research in Africa and foster research collaborations within the regions and between the regions and other external parties, a regional implementation workshop on sustainable energy in sub-Saharan was organised in the African region.

This regional implementation workshop was organised by ICSU Regional Office for Africa in collaboration with the Maseno University in Kenya as part of a series of activities funded through the ICSU grant from the Swedish International Development Cooperation Agency (Sida).

The workshop was part of the activities by ICSU to come up with a trans-regional integrated sustainable energy research strategy within the framework of Future Earth. This event was a follow-up to a regional-global integration meeting on sustainable energy that was held in April 2013, in Mexico City, Mexico, hosted by the ICSU Regional Office for Latin America and the Caribbean. The Kenya workshop made use of background information and recommendations from the Mexico meeting as well as the work previously done by the energy scientific community in the African region to harmonise ICSU's activities on sustainable energy within and outside the region.

Objectives

The workshop sought to identify alignment among the ICSU Regional Offices' science plans on sustainable energy and bring together the researchers involved in the regional planning exercises to explore synergies. The main aim was to develop an overall energy research implementation strategy that would be instrumental in harmonising ICSU's activities on sustainable energy, to be implemented within the Future Earth framework. It also sought to engage key regional and other stakeholders in energy research, ensure proper linkages and establish synergies between key sustainable energy players within and between the regions.

Participation

The regional implementation workshop brought together 36 energy scientists from 16 countries, mainly in Africa, but also from other parts of the globe. Representatives of key regional energy initiatives and international organisations within and outside the continent were represented¹. Involvement of scientists from outside the region was done on the basis of the identified value they would add to the outcomes of

¹ See list of participants at the end of the report

the workshop as well as for their potential to engage with African scientists on the way forward that would enhance sustainable energy collaborative efforts. The workshop gave a platform for key energy stakeholders in the region to deliberate on issues related to energy research with the hope to identify possible areas of inter- and intra-regional collaboration.

Workshop programme

Day 1

The activities of the first day were divided into three sessions. The opening session was followed by a plenary dealing with global sustainability and the third session deliberated on ICSU regional activities on sustainable energy. The afternoon programme was dedicated to breakout discussions and feedback.

Opening Session

Welcome and opening of the workshop: The official opening of the workshop was done by Dr Collins Ouma from the Maseno University, on behalf of Prof Dominic Makawiti (VC University of Maseno). In his opening remarks, Dr Ouma presented an apology from Prof Makawiti who could not be present during the workshop due to other engagements. In his address, Dr Ouma

- stressed that energy issues have been an enigma throughout the course of human history across all the corners of the globe.
- emphasised that energy research on the continent should address efficient extraction, distribution and usage, with particular attention given to the new and renewable energies.
- pointed out that the Maseno University managed to play a role in the renewable energy arena and has championed the process of globalisation by developing and transferring knowledge and skills for energy research and training.
- called for an integrated approach based on regional cooperation to foster collaboration between the different stakeholders in sustainable energy research on the continent with technical support from partners from other parts of the globe.
- emphasised on a proper understanding of, and adaptation to the challenges and opportunities,
- highlighted that global dynamics would require leveraging knowledge, technology and socio-economic diversity in the region.
- pointed out that the Maseno University will be fully committed to work with ICSU and other stakeholders in the region to implement the resolutions derived from this workshop.

Introduction and objectives of the workshop: In her introductory remarks, Dr Edith Madela-Mntla, Director of ICSU ROA, gave a brief review of ICSU's mission, governance structure as well as its

strategic priorities. She went on to discuss the mandate of the ICSU Regional Offices with particular emphasis on ICSU ROA's activities related to the implementation of its four science plans and the book projects. The participants were challenged to join ICSU ROA's international research consortia and also contribute chapters in a number of ICSU ROA books that are in preparation as well as future books.

Dr Madela-Mntla acknowledged the financial support from Sida through the grant to ICSU, which made this workshop possible, and thanked the Maseno University for its dedicated support in organising the workshop. She pointed out that the implementation of all priority areas of the region, including sustainable energy, can be done under the umbrella of the Future Earth initiative. In line with this, the objectives and expected outcomes of the workshop were presented.

Global overview of energy needs within the context of ICSU and the Future Earth framework: In her presentation, Ms Katsia Paulavets, ICSU coordinator for the Sida project, presented the Future Earth initiative. She put special emphasis on its attributes that involve the provision of a global platform for

international interdisciplinary research collaboration on global environmental change for sustainable development, as well as strengthening partnerships between researchers, research funders and research users. She outlined the genesis and evolution of Future Earth, key principles of its implementation, the proposed research themes, its conceptual framework and cross-cutting capabilities, as well as its governance structure. It was pointed out that Future Earth is a global programme that will have regional representation in its governance structure.

Ms Paulavets pointed out that Future Earth was established as a response to calls for international integrated collaboration and solution oriented research that would serve as a vehicle to respond to the urgent global environment challenges and identify opportunities to global sustainability. Based on this, she emphasised the opportunity for the energy scientific community to find ways of integrating regional sustainable energy activities in the Future Earth framework. Some of the challenges faced by the communities globally were discussed, and it was noted that energy was an integral part of these issues.

With respect to the next steps of Future Earth, Ms Paulavets pointed out that the process of setting up an Executive Secretariat is under way with the aim of recruiting an Interim Director and nominating members of the Scientific Committee in the next few months. Soon, a call will be opened for hosting the Executive Secretariat, which is expected to be fully operational by April 2014.

Global Sustainability - opportunities for integrating research on sustainable energy

Prof Decio Gazzoni from EMBRAPA presented the recommendations from the Global-Regional Integration Workshop on Sustainable Energy held in Mexico, in April 2013 attached as Annex 1. He pointed out the need for participants to reflect on these recommendations as they deliberate on issues prepared for this workshop with the aim of taking advantages of as well as fostering cross-regional and/or North-South cooperation and synergies.

Prof Gazzoni also gave a presentation on the global overview of energy with emphasis on sustainable sources as well as on the present situation and future scenarios. In this presentation, he highlighted the exponential growth in global energy demand. He noted that it is projected that by 2060, usage of renewable energy will surpass that of conventional energy due to a number of factors that include the proliferation of supportive government policies, the rising cost of conventional energy, reductions in renewable energy costs, and claims for a cleaner environment.

Dr Daniel Egbe from the African Network for Solar Energy (ANSOLE), gave a presentation on the activities of ANSOLE in promoting sustainable energy in Africa. He pointed out that ANSOLE is a platform of exchange among various stakeholders (non-experts, scientists, industrial experts, public and private institutions, NGOs, etc.) who are all devoted to promoting the use of sustainable energy to address the acute energy problems in Africa while preserving and protecting the environment. He outlined ANSOLE membership, which covers countries within and outside Africa.

He pointed out that the goals of ANSOLE include activities that foster training and education in renewable energy at various skills levels; research directed towards renewable energy among African and non-African energy scientists; and promote and encourage the use of renewable energy in Africa. He encouraged individuals and/or institutions to join the network.

Dr Peggy Oti-Boateng from UNESCO Nairobi Office presented the facts and figures of new mineral discoveries in sub-Saharan Africa and pointed out that the energy deficit has to be addressed to ensure access to modern energy services, improvements in energy efficiency, and doubling the share of renewable energy in the global energy mix. She pointed out that renewable energy has attracted increasing attention from public and private investors, to the extent that African governments are pressed to plan and develop strategies that will address options related to the development and adaptation of renewable energy technologies. However, she continued, existing fragmented information indicates that there are very few countries on the continent with energy/renewable energy policies, and also few institutions engaged in teaching and research in renewable energy science and/or engineering.

Dr Oti-Boateng emphasised the need for establishing policy frameworks, legislations and strong institutional frameworks that will stimulate production and processing of renewable energies in a sustainable manner. As a way forward, she expressed the need for the region to have clear strategies to set up energy policies, enhance institutional and human capacity development as well as establish partnerships among stakeholders in the region.

ICSU Regional Activities on Sustainable Energy

During the session, ICSU Regional Offices' sustainable energy science plans and follow-up activities were presented and discussed. Dr Plans Hezri Adnan from the Institute of Strategic and International Studies in Malaysia, presented activities for the Asia and Pacific region while Prof Anthony M H Clayton from West Indies University in Jamaica and Manuel Chenene from Eduardo Mondlane University in Mozambique presented those from Latin America and the Caribbean, and Africa , respectively,

Breakout Session 1: Enhancing Regional Capacity for Addressing Sustainable Energy Challenges

Participants were divided into three mixed groups and each was tasked to focus on addressing specific questions.

Group 1 was tasked to discuss and recommend on:

1. What are the regional research needs on sustainable energy?
2. What capabilities are available in the region to address the research needs and what role can ICSU play (in the context of Future Earth) to strengthen the existing capacities on sustainable energy?

Group 2 worked to address the following:

3. Who are the key stakeholders across the region and beyond, with whom ICSU should explore options for partnerships? What mechanisms exist in the region for engaging with each of these stakeholders and how can ICSU exploit these?

Group 3 deliberated on the following questions:

4. What areas of synergy exist between the ICSU regions and how can these be taken advantage of?
5. What are the potential funding sources and what are the best approaches to identify funding opportunities (at international, regional and local levels)

Presentation of results from breakout session 1

Group 1

The group identified the following regional research needs on sustainable energy:

- Lack of local and regional sensitisation/awareness of success stories of sustainable energy activities within and outside the region
- Funds for energy research in the region need to be mobilised through collective actions by research consortia comprised of regional and international scientists
- Designing affordable and locally acceptable energy sources that would improve energy accessibility, reduce costs, and improve on energy efficiency. Factors that influence people to make energy choices at community and household levels need to be identified
- Energy resource distribution and potential in the region needs to be mapped starting at national level
- Develop entrepreneurships on renewable energy to improve livelihood of the populace, especially for the rural and urban poor. This development should be managed in parallel with issues related environmental impact analysis
- The development and implementation of sound energy policies at national and regional levels that would integrate and secure energy supply through diversity of sustainable energy

- Research on trans-boundary resource sharing that would promote energy resource development as well as establishment of intellectual property protection legislations
- Research on urban energy needs

On issues related to the capabilities available to address the research needs and the role ICSU can play to strengthen existing capacities on sustainable energy, the group came up with the following recommendations:

- There is need to assess the existing regional and national infrastructure, expertise and sustainable energy potentials in the sub-continent. Scientists and other stakeholders should get access to , work and share information with incubations centres for business and innovation within and outside the region (for example, Climate Innovation centre, Chandaria Business Innovations and Incubation Centre (KU), Kenya Industrial Research and Development Institute (KIRDI))
- There should be an intensive public and private sector engagement that would strengthen outreach programmes/activities and feed into the sustainable energy policy formulation processes
- There should be doubled efforts to establish and improve engagements with inter-governmental organisations (such as UNESCO), research funders and other stakeholders active in the region (for example, African Sustainable Energy Association (AFSEA), ANSOLE, ENDA), to strengthen scientific capacity development through trans-disciplinary and multi-institutional energy research.

Group 2

The group members came up with a list of sustainable energy stakeholders with whom ICSU should explore options for partnerships. These included universities and research centres, professional bodies and networks, relevant government ministries and agencies as well as parastatals, private sector and community representatives. Establishing working relationships with inter-governmental agencies and UN agencies active in the region, regional economic development organizations, local and regional NGOs was also considered to be paramount. It was also recommended that international scientific unions and young scientist organisations should be integral parts of the process and should be actively involved. To bring funds on the table, it was recommended that it would be crucial for ICSU to engage with regional and international research funding agencies as well as development aid funders and micro-funding agencies that are active in the region.

To foster strong working relationships with the different stakeholders in the regions, ICSU should look into possible joint activities such as co-organising workshops/seminars/conferences and seek to bring policy-makers on board to help co-define problems and solutions. ICSU, through its Regional Offices and partners, should also work with intended beneficiaries to define the problem and possible solutions.

ICSU should and needs to play a catalytic role to bring together energy researchers and key local advisors who are committed, to develop energy research in the region. ICSU should develop/strengthen links with national focal points (people or agencies) in the different countries of the region.

Group 3

The group identified a number of existing potential areas of synergy that could foster collaborative sustainable energy research of key players in the ICSU regions. Each region comes on board with experience that others could benefit from. There are abundant untapped renewable energy resources as well as knowledge, information and technologies that could be shared through collaborative energy research and human resource exchange programmes between the regions. There are a lot of potential intra- and inter-regional collaboration opportunities between the energy scientists and other stakeholders to prop up and develop energy research as well as influence energy policies in the regions.

On the issue of what role ICSU can play to strengthen the existing capacities on sustainable energy in the region, the following recommendations were made: ICSU should

- work with regional energy stakeholders to identify and establish contact points for resources and research information that could be shared among the interested parties
- promote networking and provide professional linkages and identify regional representatives for renewable energy projects as well as centres of excellence
- explore the possibility of establishing an inter-regional panel that would provide fora for discussion on energy research issues by the stakeholders in the regions.

A number of energy research funding opportunities were identified and ICSU was requested to find possible ways of engaging them. The potential funders included governmental regional agencies, UN agencies, as well as global and regional funding agencies. Further, ICSU was encouraged to

- get contact persons in each of these organisations and develop a concept paper that could be used to attract the attention of the funders that are active in each region.
- look into the possibility of providing seed funding, through small grants that would help in triggering funds from the donor communities in the regions.

Day 2

Design of specific trans-disciplinary energy projects to be implemented in the region

This session was preceded by a presentation by Dr Manuel Chenene from Eduardo Mondlane University on the existing ICSU ROA generic energy project proposals that were derived from the latter's science plan on sustainable energy. The presentation served as a baseline for discussions during the second breakout group session, and facilitated alignment of energy activities in the region with the Future Earth framework. Dr Chenene recommended that the energy scientific community in the region should consider publishing a book about sustainable energy activities in the region.

The participants were split into three breakout groups to brainstorm on the development and implementation strategy of sustainable energy research framework for Africa. Each group focused at working on designing regional multi-disciplinary and trans-regional energy projects that could be implemented within the context of Future Earth. The implementation would involve the participation and collaboration of scientists from within the region as well as from other parts of the globe, taking into account the work that has already been done in the region. The participants also explored fundraising opportunities for sustainable energy activities in the region as well as areas of synergy between and among ICSU Regional Offices' energy activities.

Breakout 2 presentation and discussion

The groups noted that the scope of the energy projects, as presented in the ICSU ROA proposals, should reflect the national, regional and trans-regional nature of the activities. It was noted that the activities listed in each proposed project were too wide and should be narrowed and focused. A recommendation was made for a need to focus efforts on a few of these activities that could be effectively implemented and have impact on the society at large. To achieve the critical mass of energy expertise in the region, the projects should seek to develop human capacity using infrastructure and expertise within and outside the region. It was noted that the ICSU ROA projects as presented, would fit within the context of Future Earth, however should further consider the integration of social aspects in the projects.

The following recommendations were proposed:

- Socio-economic aspects of energy should be taken into account when planning and implementing energy projects.
- Involvement of all key stakeholders at the initial stages and in co-designing is crucial, especially civil society (such as ENDA, Practical Action), decision makers as well as actors from the economic, social and human sciences.

- Religious and cultural organisations were also identified as crucial stakeholders in successfully implementing sustainable energy projects in the region, especially for technology awareness and acceptance.
- Research funders should be engaged from conception of the projects so that there could be buy-in (from the donor community) to the planned future sustainable activities in the region.
- Develop mechanisms to effectively engage local and international media that can influence policy makers as well as the communities at large.
- The design, implementation of energy activities should take into cognisance the expertise, tools and infrastructure existing within and outside the continent. Energy research consortia should link up with regional and international energy organisations such as ANSOLE, the International Renewable Energy Agency, the Household Energy Network, and Latin America Thematic Network on Bioenergy, the Brazilian Agricultural Research Corporation (EMBRAPA), among many others.
- Bio-energy projects should focus on small scale bio-energy/bio-fuel processes and look at successful business models and policies that can improve market incentives
- The research community and other stakeholders should seek to expand the scope of the projects to include research on advancement on solar energy materials in Africa
- There is need for the creation of a database of energy scientists in the region and relevant institutions as well as mapping Africa's energy landscape. This should be built on work which is currently being done by IRENA and ANSOLE, etc.

Funding Opportunities: It was noted that there are a number of members of the donor community that are providing funds for sustainable energy activities in the region and around the globe. The following were identified as potential funding agencies that would be worth engaging with: African Bio-fuels and Renewable Energy Fund; Future Earth Research funders; development aid funders; multinational funders; national governments; intergovernmental funding agencies; private sector and parastatals; multi-national organisations; and development banks.

Way forward

It was noted that the sustainable energy research activities in ICSU regions can and should be implemented within the context of Future Earth. Intra- and inter- regional collaboration was emphasised to build an effective sustainable energy research community that would respond to the societal needs. The following recommendations were proposed as a way forward:

- To implement sustainable energy activities, scientists should align them to the Future Earth framework in order to achieve global sustainability in energy research.
- International energy research teams addressing selected sustainable energy themes should be established and international research consortia on energy already established by ICSU ROA should form the building blocks of these teams.
- Scientists in the region, led by the energy research teams/consortia, should work to produce a map of the African landscape in the field of sustainable energy, and the teams should come up with the best way to do it.
- Energy stakeholders should put their heads together to produce a directory of institutions involved in serious research and development programs in sustainable energy and related fields. A database of energy scientists that are active in the region should also be developed.
- To show-case the work done on sustainable energy in the region, it was recommended that scientists and other key stakeholders should work to publish a book on sustainable energy research in the region. ICSU ROA could coordinate this project, with support from the energy teams/consortia.

- ICSU ROA project proposals on sustainable energy should be reviewed to fine-tune them to few implementable projects whose implementation could involve scientists from other regions, which would strengthen north-south as well as south-south collaborations.
- Projects on solar energy-related issues should be included as part of ICSU ROA energy projects
- Work should be done to develop and establish energy institutional and policy frameworks as well as legislations to enhance institutional and human capacity development and also to establish partnerships among stakeholders in the region.
- As a follow-up, the Kenyan participants proposed to organise a conference next year (2014) to update each other on energy research.

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