



Enrich

**Comparative Analysis and
Recommendations to Higher Education
Institutions Top Management and
Policy Makers in East Africa**

**FINAL REPORT: COMPARATIVE ANALYSIS &
RECOMMENDATIONS**

ACT 1.4

ENRICH: Enhancing Energy Accessibility & Efficiency thorough establishing sustainable STI Support National Networks with a regional dimension in East Africa – FINAL REPORT: COMPARATIVE ANALYSIS AND RECOMMENDATIONS

University of Alicante (Spain), The Glasgow Caledonian University (Scotland), African Virtual University (Kenya), Moi University (Kenya), Mzumbe University (Tanzania), Makerere University (Uganda), Inter-University Council for East Africa (Uganda), Directorate of Research Management and Development (Kenya), Tanzanian Commission for Science and Technology (Tanzania), Uganda National Council for Science and Technology (Uganda).

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List of Acronyms

ARTI	Appropriate Rural Technology Institute
BIO-EARN	East African Regional Programme and Research Network for Biotechnology, Biosafety and Biotechnology Policy development
Bio-Innovate	Bio-resources Innovations Network for Eastern Africa
CBO	Community-based Organisation
CEDAT	College for Engineering, Design, Art and Technology
CICS	Competitiveness Investment Climate Strategy
COSTECH	Tanzanian Commission for Science and Technology
CREEC	Centre for Research in Energy and Energy Conservation
DRPS	Directorate of Research and Postgraduate Studies
EA	East Africa
ENRICH	Enhancing Energy Accessibility and Efficiency through establishing sustainable STI Support National Networks with a regional dimension in East Africa
GBE	Green Bioenergy
HEI	Higher Education Institution
ICT	Information and Communication Technology
IP	Intellectual Property
IRDI	Integrated Rural Development Initiatives
ISO	International Organization for Standardization
JEEP	Joint Energy and Environment Project
KPI	Key Performance Indicator
MEMD	Ministry of Energy and Mineral Development
MFPEd	Ministry of Finance, Planning and Economic Development
MOES	Ministry of Education and Sports

MoGLSD	Ministry of Gender, Labour and Social Development
MTIC	Ministry of Trade, Industry and Cooperatives
MU	Mzumbe University
NaCRRRI	National Crop Resources Research Institute
NARO	National Agricultural Research Organisation
NCRI	Natural Chemotherapeutics Research Institute
NURRU	Network of Ugandan Researchers and Research Users
OIs	Other Institutions
PSF	Private Sector Foundation
QA	Quality Assurance
REA	Rural Electrification Agency
RIDEM	Rural Initiative for Development and Environmental Management
RISE	Regional Initiative in Science and Education
RUFORUM	Regional Universities Forum for Capacity Building in Agriculture
SME	Small and medium-sized enterprise
STI	Science, Technology and Innovation
TCBN	Tissue Culture Business Network
TCU	Tanzania Commission for Universities
UCSD	Uganda Coalition for Sustainable Development
UEEF	Uganda Environmental Education Foundation
UIA	Uganda Investment Authority
UIRI	Uganda Industrial Research Institute
UMI	Uganda Management Institute
UNCST	Uganda National Council for Science and Technology
URSB	Uganda Registration Services Bureau
URT	United Republic of Tanzania
USSIA	Uganda Small Scale Industrialists' Association

Summary

The goal of the project on Enhancing Energy Accessibility and Efficiency through establishing sustainable STI Support National Networks with a regional dimension in East Africa (ENRICH) is aimed at strengthening STI co-operation in East Africa (EA). This will be achieved by promoting operational and effective management of research and innovation activities focussing on energy access and efficiency.

As part of implementation of this project, a benchmarking survey of STI institutions in Kenya, Tanzania and Uganda was conducted in July-December 2014, targeting key energy sector stakeholder institutions including Higher Education Institutions (HEIs) and Other Institutions (OIs). This activity looked at the innovation ecosystem in EA.

The survey targeted a total of two hundred (200) HEIs/OIs but recovered questionnaires from thirty five (35) HEIs and fifty one (51) OIs respectively. The HEIs comprise mainly universities while the OIs cover three main categories: public institutions, NGOs/CBOS and private for-profit institutions.

The main findings show that:

- The innovation environment in EA Universities requires streamlining and strengthening.
- In general, there has been some progress in the Innovation Ecosystem but there is a shortage of qualified staff in HEIs for STI activities and that limits the potential for research expansion in the region.

- Explicit university/government strategies and funding for supporting Research, Innovation and Knowledge Exchange are unclear and should be strengthened.
- International and Regional Collaborations and Exchanges need to be strengthened.

The main recommended actions on the Innovation Ecosystem for EA include the following:

- Policies and support systems and programmes for research and innovation in the energy sector should be widely disseminated. Additional emphasis should be placed on commercialisation, spin off creation and start-up investment.
- All actors should be promoted to play their roles in the energy value chain. Incentives should be created for HEIs staff to get involved.
- Government should invest in research in the energy sector.
- A comprehensive model for coordinating information on incentives, and support mechanisms for the innovators should be developed and widely disseminated.
- Information on existing innovations and energy initiatives should be shared regularly using all possible fora.
- There is need for strong IP and innovation policy to attach value to research and innovation and attract more innovators.

1. Introduction

Energy deficit and energy poverty is a big hindrance to growth and development in the EA region. Energy supply in this region is extremely expensive restricting access to energy. This hinders the STI development and hampers sustainable development.

The availability of clean, affordable, reliable and sustainable energy is a central issue to EA. The population is heavily dependent of biomass as the major source of energy and it does not meet the demand of the growing population.

Despite the energy emergency, the EA region experiences inadequate STI research support from the HEIs and experience has shown that there is no linkage between the academia, research institutes and investors or industries. The shortage of qualified and well-trained staff in HEIs for STI activities constitutes another constraint to research expansion in the region. Insufficient funding does not permit HEIs conduct research continuously since they are largely dependent on the state or external funds.

In this regard a partnership lead by the University of Alicante (Spain) and including the Glasgow Caledonian University (Scotland), African Virtual University (Kenya), Moi University (Kenya), Mzumbe University (Tanzania), Makerere University (Uganda), Inter-University Council for East Africa (Uganda), Directorate of Research Management and Development (Kenya), Tanzania Commission for Science and Technology (COSTECH) and the Uganda National Council for Science and Technology (UNCST) was created to implement the project on Enhancing Energy Accessibility and Efficiency through establishing sustainable STI Support National Networks with a regional dimension in East Africa – ENRICH. The project is aimed at strengthening STI co-operation in East Africa (EA) by promoting operational and effective management of research and innovation activities focussing on energy access and efficiency.

As part of implementation of this project, a benchmarking survey of STI institutions in EA was conducted in July-December 2014,

targeting key energy sector stakeholder institutions. This activity looked at the innovation ecosystem in the region - Science, Technology and Innovation (STI) policies, initiatives and support services. The survey was conducted with the purpose of assessing the status of research and innovation activities and STI support mechanisms among public and private institutions with specific focus on energy access and efficiency. This consolidated report, taking from the individual country reports (Uganda, Kenya and Tanzania), gives highlights of the findings from this activity.

2. Methodology

2.1 Study Area

The survey took place between July and December 2014. For Kenya it covered selected rural and urban centres. Uganda limited the area to Kampala and its periphery, while Tanzania did not include certain areas, as for example the southern parts of the country, due to transport and logistical reasons.

2.2 Target

The target respondents were identified locally in each country. They covered a wide spectrum of entities, from public HEIs to private enterprises of different sizes, intended to represent the different key sector stakeholders. In total, responses were received from 35 HEIs and 51 OIs.

2.3 Data collection

The survey was conducted using a standard questionnaire that was designed by the ENRICH project coordination team and

partners. The questionnaire was initially to be administered using the internet-based survey monkey, however this was not possible given the respondent institutions' varying internet capabilities.

The questionnaire was eventually shared as follows:

- a) Survey monkey
- b) Email
- c) Telephone interviews
- d) Physical interviews

We faced the following challenges during the survey:

The survey and feedback was quite slower than expected. The reasons for this included: lack of reliable internet connectivity, limited internet bandwidth, lack of ICT equipment or lack of human capacity to operate the survey monkey in the respondent institutions.

For some of the stakeholders the questions were complicated and the questionnaire rather long, especially private sector business operators.

Whereas several institutions confirmed receipt of the questionnaire and promised to participate, a good number of them failed to meet the deadlines of submission. This affected (lowered) the response rate. In one of the countries the response rate was extremely low, that is why the initial deadline of September 2014 was extended until December 2014.

Part 1. Higher Education Institutions (HEIs)

1. Data concerning respondents

1.1 Respondents

A total of 35 responses were obtained from HEIs. The ratio of responses varies from country to country.

1.2 Number of students

The largest volume of students at HEIs falls under the Undergraduate category, representing a 92.5% of the average number of students for EA. Master students (6.4%) and PhD students (1.1%), despite being in a lower proportion, are more oriented towards research activities.

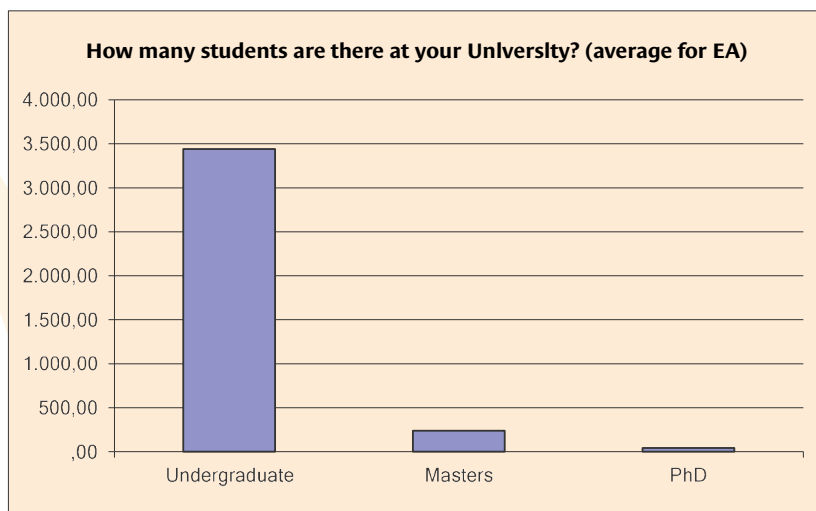


Figure 1.2(a): Number of Students Enrolled in the HEIs (Average for EA)

The numbers indicated here are an average of the 35 EA institutions. In the case of Makerere University, with over 40,000 graduates, the survey only considered those related to the subject of energy.

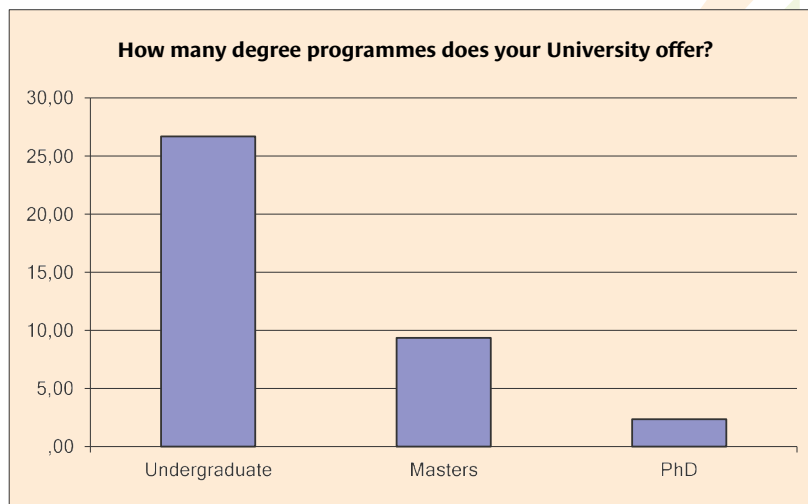


Figure 1.2(b): how many degrees does your university offer?

The undergraduate degree programmes are the most numerous (69.5%), followed by Masters (24.4%) and then the PhDs (6.1%). Consequently it is apparent that the regional university education is generally inclined towards fundamental knowledge with less attention being directed towards research, although this is a natural tendency within the HEI sector.

Besides degree programmes, it was observed that most of the universities also offer non-degree programmes (Figure 1.2(c)). The majority of which are based on professional training.

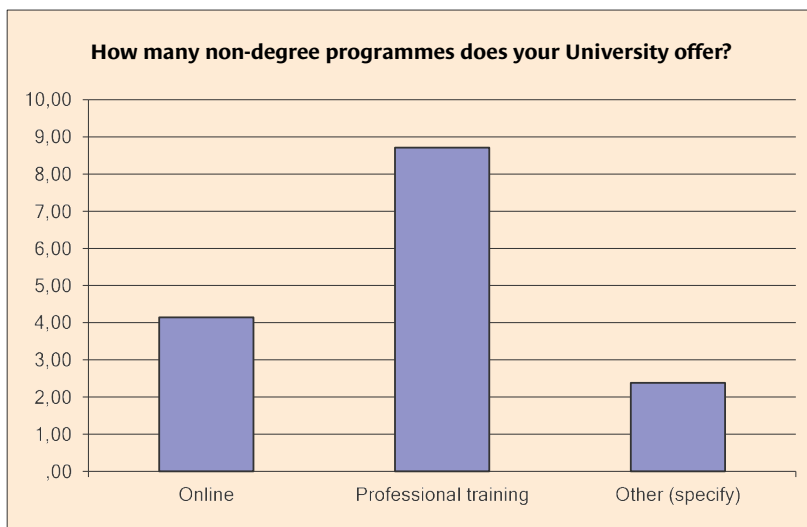


Figure 1.2(c): Average of Non-degree programmes offered in the Universities

1.3 Quality Assurance Mechanisms at the University

Most of the Universities in the region have some type of Quality Assurance (QA) mechanism and some of them are ISO certified. The main QA processes apply to the validation and quality of courses taught, rather than internal processes for management.

In order to ensure proper QA and benchmarking, the relevant country government agency is involved or has a final sign-off on the process. The process duration is variable, and can range from less than six months to more than one year, depending on the subject area and scope of the programme.

1.4 Students studying on energy related programmes within Universities

Among the sampled universities, there is a total of 108 undergraduate academic programmes related to energy (Figure 1.4 (a)), with the largest numbers falling under Biofuels and Solar.

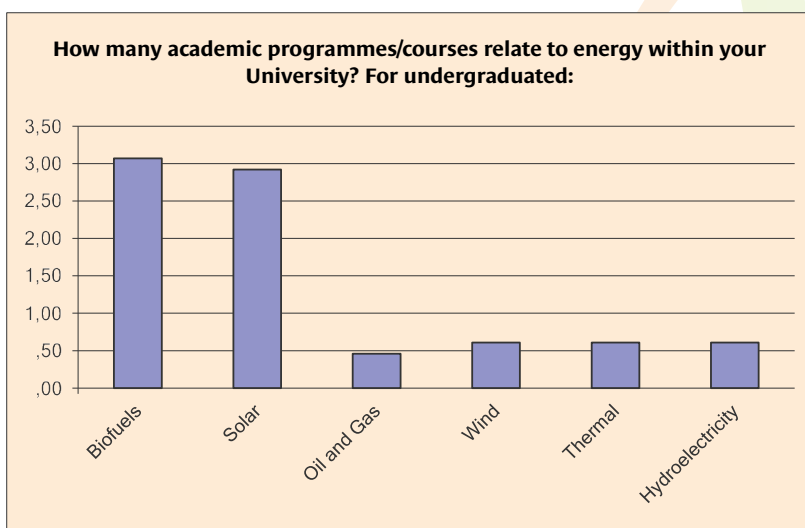


Figure 1.4(a): Energy related programmes (average) at undergraduate level.

Of those institutions offering post-graduate studies in the field, Oil and Gas, Thermal and Hydroelectricity are the main ones.

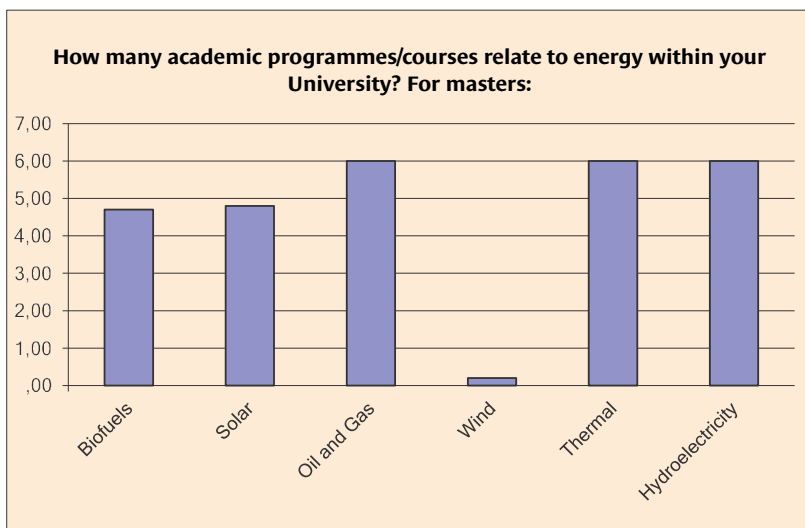


Figure 1.4(b): Energy related programmes (average) at post-graduate level

It is interesting to note that the post-graduate programmes are all at Masters level. There are very few PhD programmes available in the field of energy at the moment; out of all the responses, only 13 programmes were identified, which represents less than 0.5% average per institution.

1.5 Energy related research projects/consultancies carried out in the last 5 years

The compiled data for the regions does not bring a clear picture, as the targeted audience may not have been involved in actual consultancy (non-research) activities from the university. Most of the collaboration identified was between universities, mainly at national level, but also at regional and international level. The main topic of collaboration was on bio-fuels.

2. Cooperation on energy

2.1 Formal International Collaboration within Africa

The Universities are involved in formal international collaborations with other Universities in Africa. These mainly involve exchanges and research projects. There are a very limited number of joint degrees. Considering the relative small number of exchange activities and the even smaller number of joint degrees, a potential issue could be the lack of mutual recognition of studies, something that is not required for research.

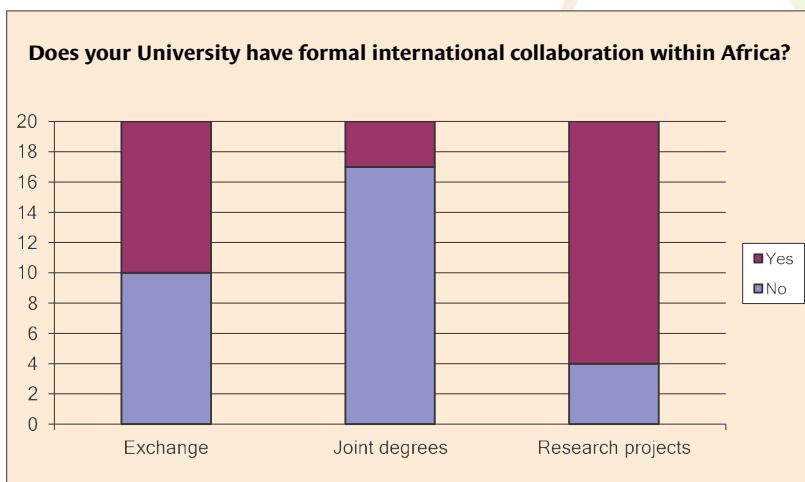


Figure 2.1: University formal collaboration within Africa

2.2 Formal international collaboration outside Africa

Universities have a very similar split when it comes with collaborations outside Africa. There is a relatively small number of joint degrees collaboration, and a much larger proportion of research

collaboration. A similar conclusion from these numbers can be drawn as in 2.1.

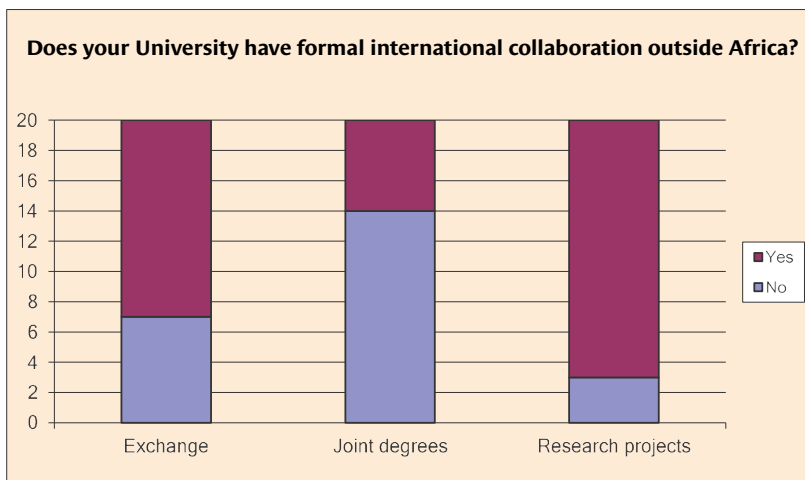


Figure 2.2: Formal university collaboration outside Africa

2.3 Collaboration with external non-university partners: International

There are very limited collaborations with non-university partners at international level. These collaborations are only in Biofuels and Solar energy, as it can be seen on Figure 2.3.

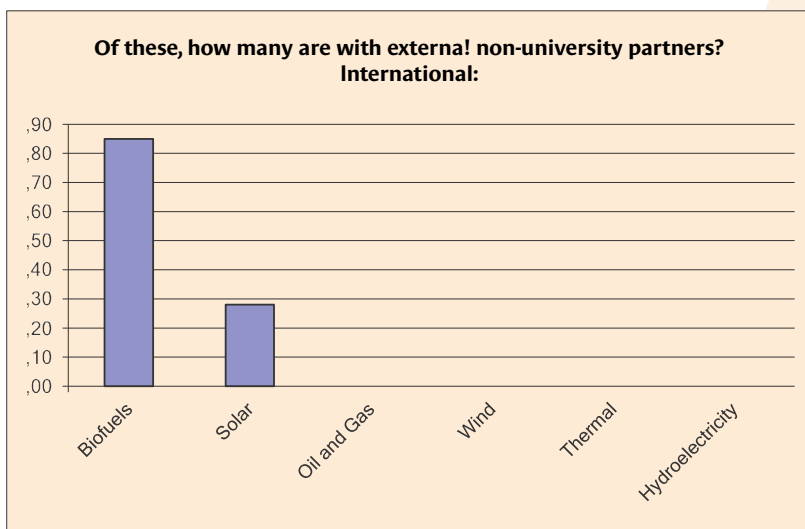


Figure 2.3: International collaboration with non-university partners
(International)

2.4 Existing Academic Programmes

Academic programmes linked to the energy sector at Universities in the region show a similar distribution in the three countries. We can see that at undergraduate level (Figure 2.4(a)) most of the programmes available are on Biofuels and Solar. A similar distribution is seen for PhDs (Figure 2.4(c)), but there is a relatively even distribution when it comes to Master level programmes (Figure 2.4(b)).

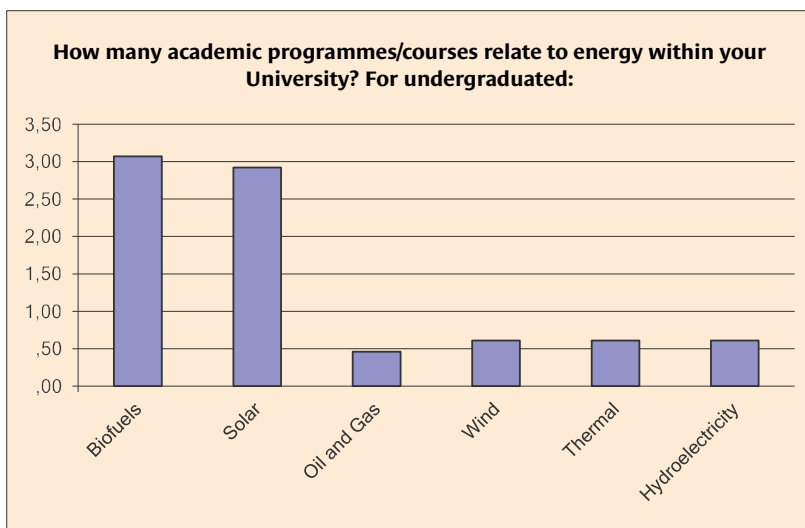


Figure 2.4(a): Courses at Undergraduate level

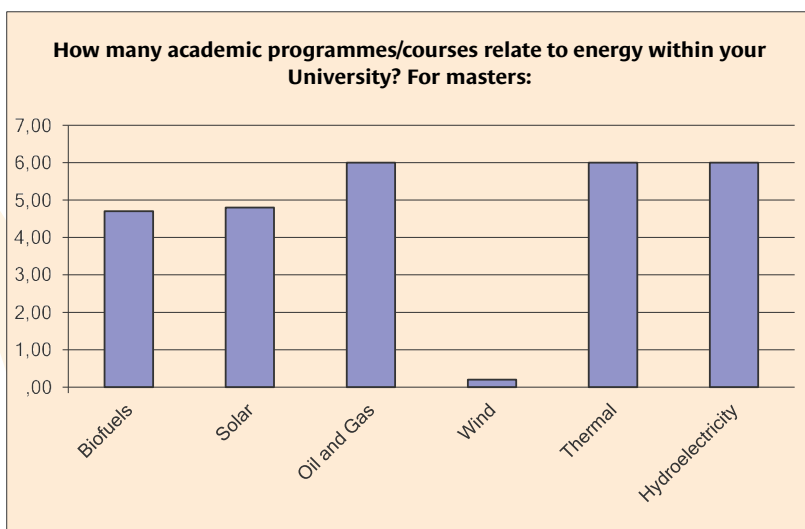


Figure 2.4(b): Courses at Masters level

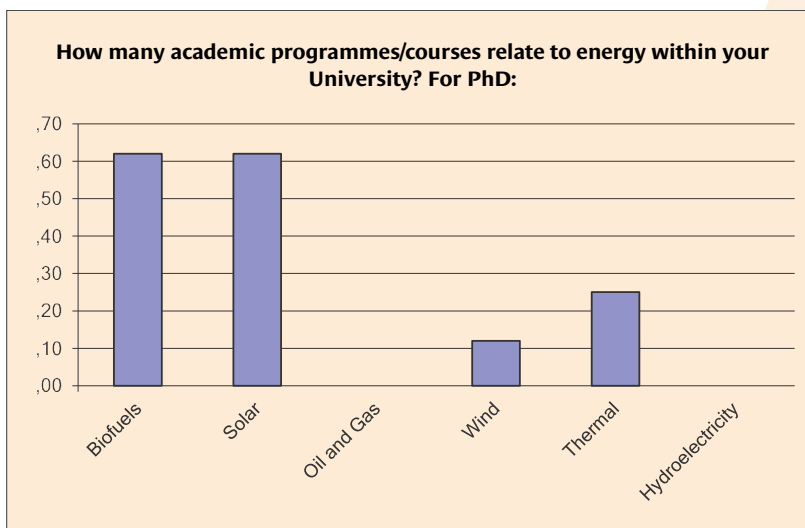


Figure 2.4(c): Courses at PhD level

3. Innovation environment

3.1 Strategy for Research, Innovation and Knowledge Exchange

There is a strong support in the region from the individual governments on Research Grants (Figure 3.1), but at the same time the results of the survey show that across the board there are improvement opportunities when it comes to funding or supporting spin-off creation or start-up investment.

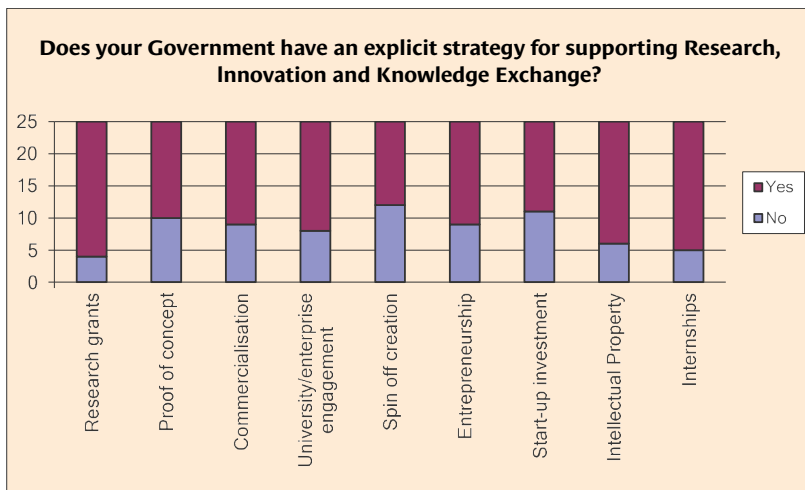


Figure 3.1: Strategy for supporting activities from the government

3.2 University strategy for Research, Innovation and Knowledge Exchange

The universities strategy for supporting research has many similarities to the strategy from governments. As most of the universities in the country are publicly funded, this is a clear reflection of the transfer of strategies and priorities from government to universities.

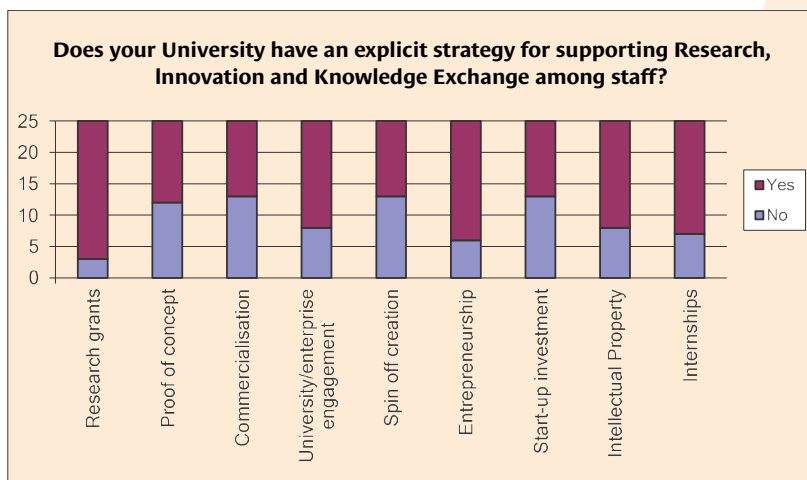


Figure 3.2: Strategy for supporting activities from the university

3.3 Metrics for Research, Innovation and Knowledge Exchange

When it comes to metrics to measure research, innovation and knowledge exchange, there is one country that has no mechanisms (Uganda) although it recognises the need of them.

What has been identified is that there is no standard measurement across the board even within the country. The main KPIs are based on publication, patents and research grants received, which are usually directly linked with funding or ratings.

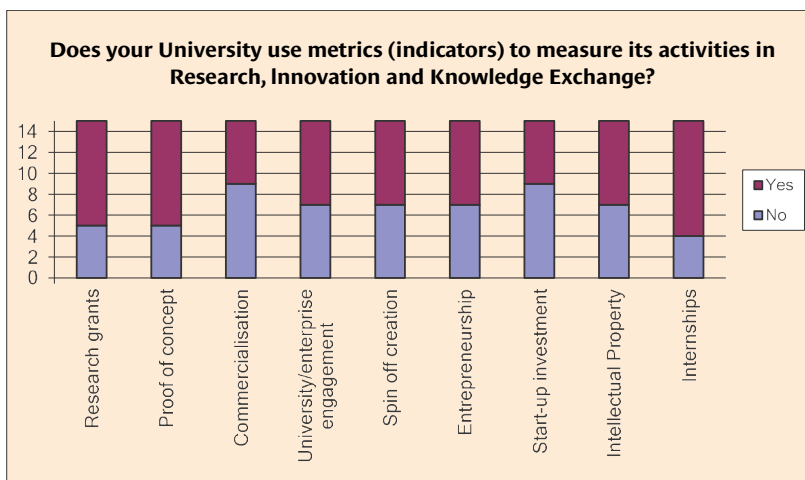


Figure 3.3: Existence of KPIs within universities

3.4 Offices for supporting Research, Innovation and Knowledge Exchange

There is a majority of institutions (93%) that have a specific office for supporting Research, but to a lesser extend Innovation and Knowledge Exchange activities. The qualitative results of the question on the role of that office were not very specific, but it could be seen that there is no standardised operational structure and the support that the offices provide vary depending on the institution and their internal set up. Some of them only support academics, others support students, but none of them seems to have a holistic approach.

3.5 Incentives for Research, Innovation and Knowledge Exchange

Institutions have incentive programmes for staff, overall 81% (see Fig 3.5) of them, but the % varies from country to country quite widely, from 50% in Uganda to 94% in Tanzania. In this case, also the qualitative data is not very clear, but the incentives range from funding to attend international conferences to actual research funding for further activities. Some institutions offer academic promotions (in role or in salary). The KPIs for the incentives are usually linked to publications and patents.

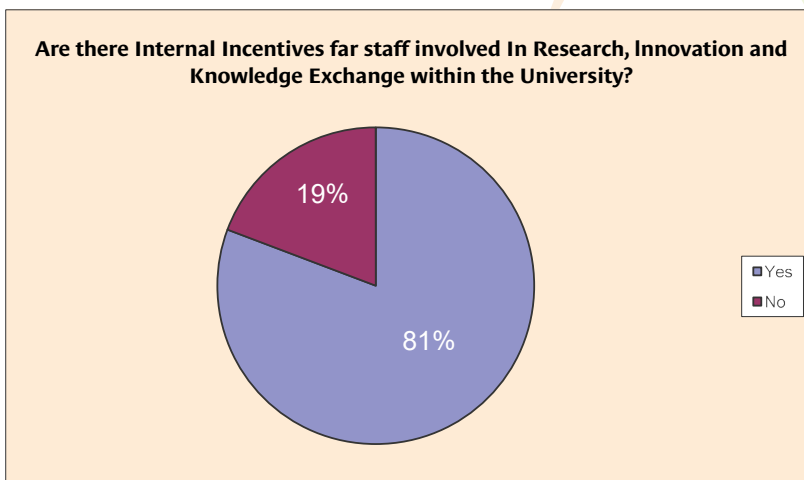


Figure 3.5: Are there internal incentives for staff involved in Research, Innovation and Knowledge Exchange within the University?

4. Suggestion on topics for trainings

To ensure energy access and efficiency through established sustainable STI Support National Networks with a regional

dimension in East Africa, the following are the suggested topics for training:

- Importance of introducing energy related programmes in Higher Education Institutions and develop existing curriculum.
- Strategies to support research, innovation and knowledge transfer in general, and on energy related issues in particular at national, regional and international level.
- Strategies for commercialising research and research output.
- Capacity building through post-graduate training.
- Strengthening networks nationally, regionally and internationally to enhance research in energy, STI and related activities

5. Main conclusions from HEIs

Governments in the region and HEIs are making an effort to encourage research, training, development and knowledge transfer activities, particularly in the area of energy, as it is considered a burning issue in the region, but there are still some areas to cover and improvements to be made. Having a unified and consistent strategy seems key to encourage development and collaborations at all levels.

Some of the identified main conclusions and/or needs are:

- There is little emphasis on the energy programmes in the HEIs. Student numbers need to be increased.
- The existing strategies and support structures to support research, innovation and knowledge exchange are not implemented efficiently.

- There is a lack of well-trained staff in HEIs for STI activities.
- There is a lack of funding to conduct the required research on energy related issues.
- International collaborations need to be strengthened.
- There is a clear match between HEIs' plans and the national development plans in this area, but in some cases they need to be harmonised.

Part 2. Other Organisations

1. Data concerning respondents

1.1 Respondents

A total of 53 responses were received from the three countries in the region. The targeted organisations can be grouped in three: Public institutions, NGOs/CBOs and Private for-profit. The respondents to the survey include: Directors of the organisations, planning officers, information and communication technology officers, researchers and factory managers, among others.

1.2 Sectors in which the participants work

The areas in which these organisations work cover the whole spectrum, although there is least engagement in Wind and Ther-

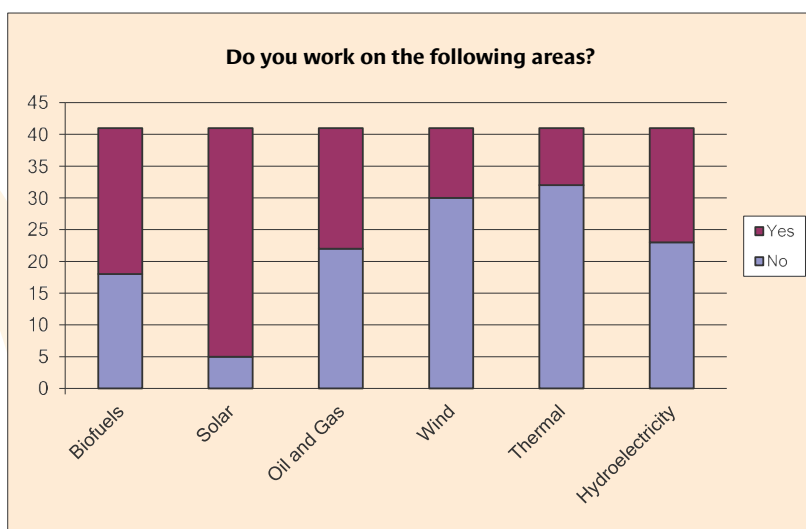


Fig 1.2: Do you work on the following areas?

mal activities. The main ones are Solar, Biofuels and Oil & Gas (Figure 1.2).

1.3 Geographical Area of Activity

The survey wanted to establish the geographical area of activities. Three options, international, national and regional, were given to the participants. The majority, and in some countries all of them, have a national scope. Other organisations expand that scope to the region and, to a lesser extent, internationally (Fig. 1.3).

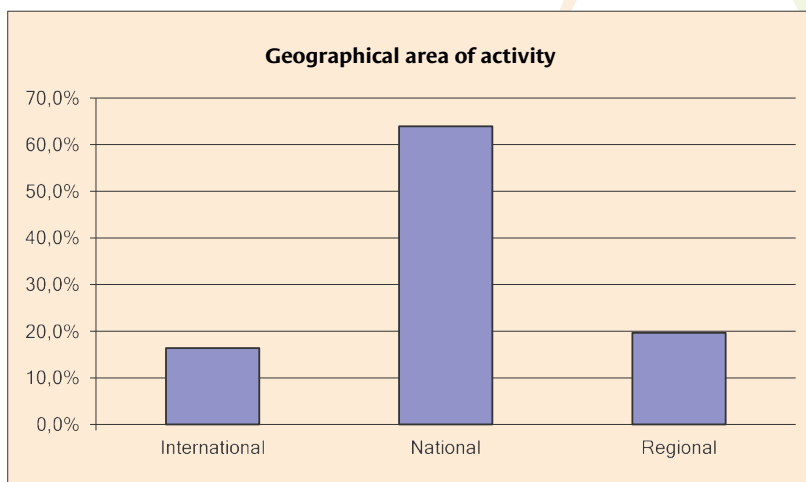


Figure 1.3: Geographical area of activity

1.4 Number of employees

The survey wanted to get a statistical idea of the type of companies that replied. It has not been possible to get a relevant match from all respondents (some information was missing or declined

to respond), but we managed to get a general overview on the size of the organisations.

When considering the number of employees, we are taking the EU definition of SMEs:

- Micro Business, less than 10 employees: 29% of respondents
- Small Business, less than 50 employees: 34% of respondents
- Medium Business, less than 250 employees: 29% of respondents
- Large Business, more than 250 employees: 8% of respondents

Another aspect to consider when grouping businesses is the turnover of the organisation, when available. Local currencies have been converted into US dollars:

- Micro Business, under 2 million turnover: 77% of respondents
- Small Business, under 10 million turnover: 23% of respondents

The largest turnover was more than 6M USD, and the smallest was 2,800 USD. Please note that this grouping is considering EU definitions, the reality in each country can be very different and a relatively small turnover could sustain a large business in terms of number of employees.

1.5 Funding Sources

These organisations have heterogeneous backgrounds, some of them are publicly owned and other a shared partnership. That means that the funding sources come from public funds, private funds or a shared public/private funding arrangement. The over-

all for the region shows an event split in the three categories (Fig 1.5)

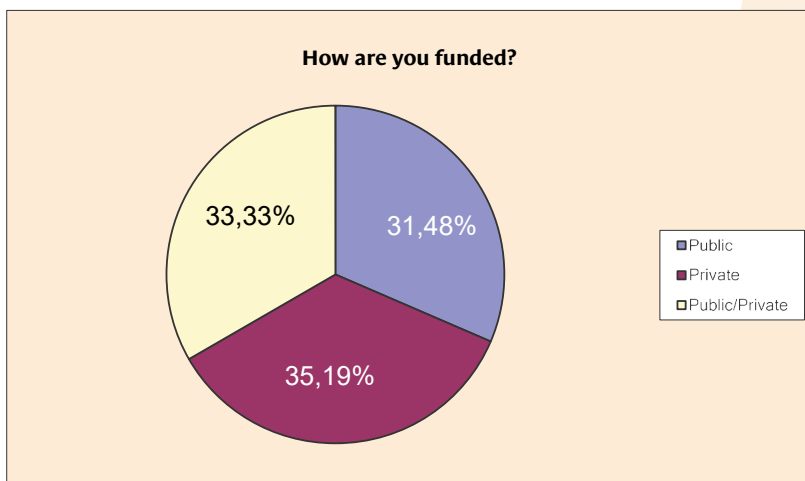


Figure 1.5: How are you funded?

1.6 Involvement in Research

The surveyed organisations have strong links with the energy sector, but that does not mean that they always conduct research or work directly with universities in any shape or form (research collaboration, use of facilities, knowledge exchange...). The areas less covered are research funding, research commercialisation and IP support (Fig. 1.6).

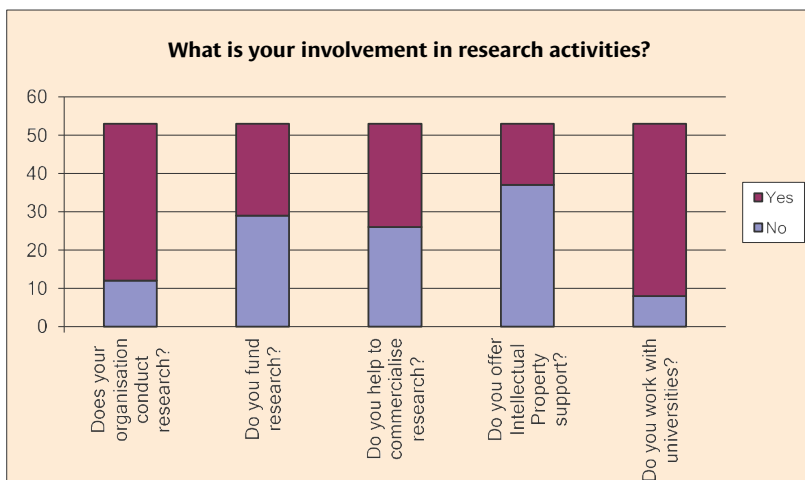


Figure 1.6: What is your involvement in research activities?

2. Cooperation with higher education institutions

2.1 Areas of cooperation with HEIs

The areas of cooperation between OIs (Government, Private and NGOs) and the HEIs were also surveyed. Most of the OIs worked with HEIs on activities related to work experience/internship placement for students and also on Knowledge Transfer activities. Engaging in funding, teaching or committee participation seem to be the most difficult areas for cooperation (Fig 2.1(a)).

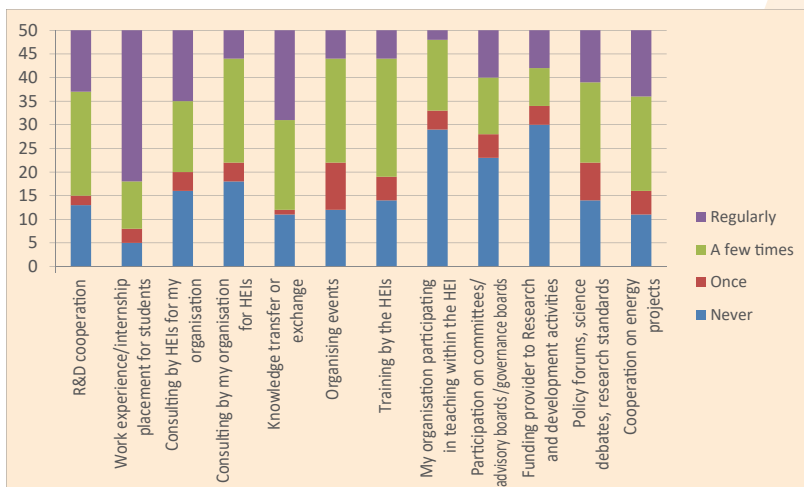


Figure 2.1(a): In the last 5 years, how often have you cooperated with HEIs?

When we consider the desired scenario, there is more willingness to participate in R&D Cooperation and Cooperation on energy projects than what is happening in reality (Fig 2.1(b))

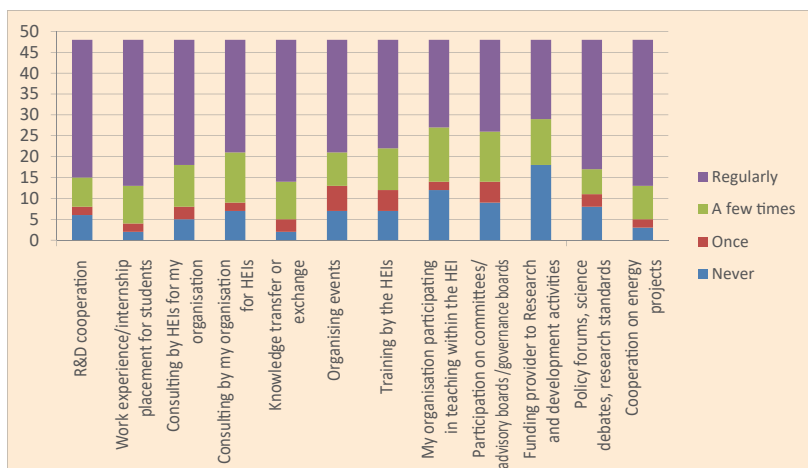


Figure 2.1(b): How often would you like to cooperate with HEIs?

2.2 Awareness on national programmes to support STI

IOs are generally aware of national or regional programmes available to support activities linked to research and development. Participation on those programmes go hand in hand with awareness, so there is a good possibility that increasing awareness will also increase participation. The programme with the lowest level of awareness and participation are Industrial Doctorates. See Figures 2.2 and 2.3 for more specific details.

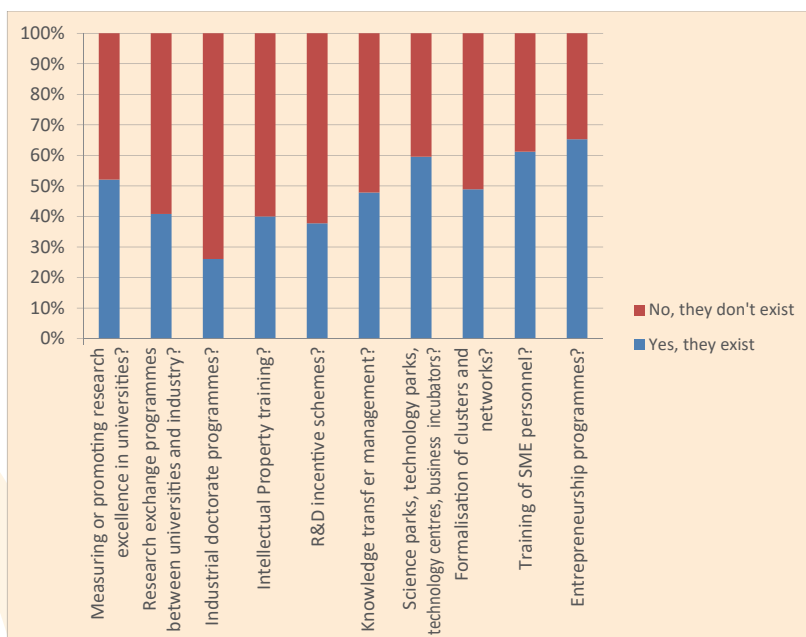


Figure 2.2(a): Are you aware of any national/regional programmes to support the following activities?

2.3 Participation on national programmes to support STI

As mentioned above, participation is linked to awareness. It is interesting to note that more than 50% of the respondents do not participate on a given programme, and more than 90% do not participate on Industrial Doctorates.

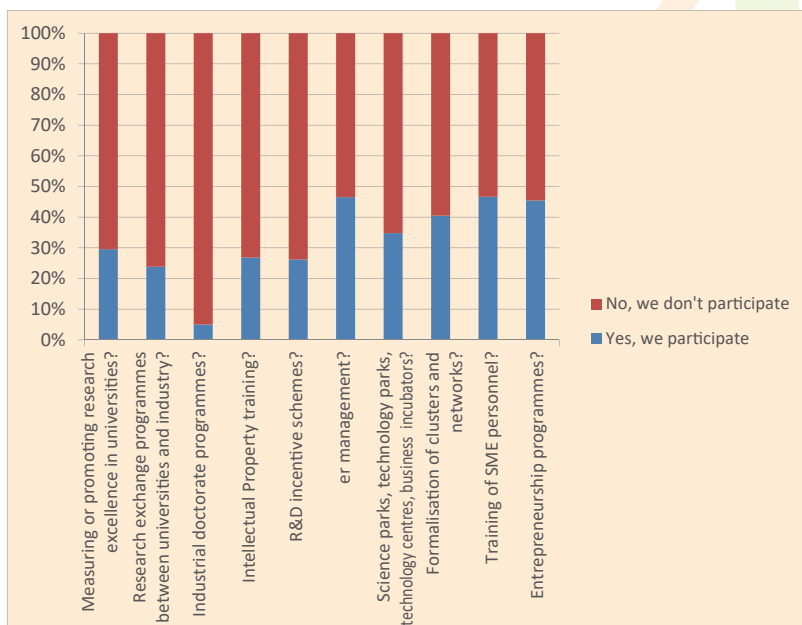


Figure 2.2(b): Do you participate on any of them?

3. Existing support programmes

3.1 Respondents awareness of policies/support measures and programmes

There is in general a lack of awareness of the policies or support measures and programmes available in the different countries, but there is a general awareness of an energy policy and that

there are Government agencies managing or coordinating research activities. In this chart, as the definitions were long but relevant, we are providing a detailed list below Figure 3.1.

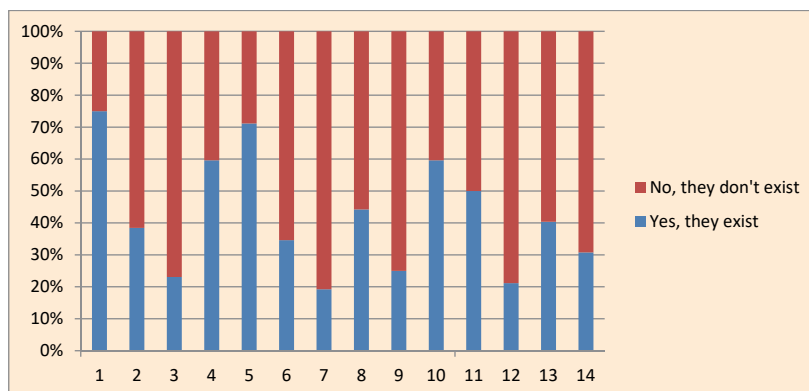


Fig 3.1: As far as you are aware, do the following policies and/or support measures exist in your country?

1. Explicit policy on energy related issues
2. Explicit research and innovation policy with annual budgetary support
3. Multi-annual research and innovation plans
4. Governmental posts with direct responsibility for research and innovation
5. Governmental organisations with direct responsibility for research and innovation
6. A support system to the commercialisation of the research and innovation
7. Metrics to measure the innovation climate
8. A well-defined legislation on intellectual and industrial protection
9. Well-defined state legislation to encourage Knowledge Transfer and innovation within universities
10. Policies to promote entrepreneurship and innovation
11. Policies to promote business incubators
12. Policies to encourage university spin-off creation
13. Policies to help SMEs access credits and subsidies linked to innovation actions and improving competitiveness
14. Support for networks of business angels/investors

3.2 Support measures for research excellence in universities

All countries have specific quality assurance bodies that interact with public universities and research institutions, being responsible for ensuring excellence and quality research outputs and outcomes. At a regional level, the Inter-University Council for East Africa is used as a mechanism for monitoring research excellence in universities.

The efforts and support measures seem to be focusing on monitoring the outcomes of the research activities, but there is no specific measurement on the support researchers receive to develop their activities.

3.3 Support programmes cited by respondents as being in existence

Respondents indicated some specific existing support programmes, depending on the individual awareness, with concrete names depending on the country. Overall, the programmes, fall within these topics:

- R&D incentive schemes
- Research commercialisation
- Knowledge Transfer management
- Science parks, technology parks, technology centres, business incubators
- Formalisation of clusters and networks
- Training of SME personnel
- Entrepreneurship programmes

3.4 Stakeholders in Science, Technology and/or Innovation

The question presented to respondents was “Please name the stakeholders that you see as the most important influential in Science, Technology and/or Innovation within your country”. As expected, the main stakeholders are Governmental units and Higher Education Institutions. This is a non-exhaustive list of stakeholders in Kenya, Tanzania and Uganda:

- Higher Education Institutions
- National Research Institutions
- Energy product suppliers and manufacturers
- National Commission for Science Technology and Innovation (NACOSTI) – Kenya
- Ministry of Education Science and Technology – Kenya
- Kenya Industrial Research Development Institute (KIRDI)
- Ministry of Science – Tanzania
- Tanzanian Commission for Science and Technology (COS-TECH)
- Ministry of Energy and Mineral Development (MEMD) – Uganda
- Uganda National Council for Science and Technology (UNCST)

4. Suggestion on topics for trainings

To enhance energy access and efficiency through establishing sustainable STI Support National Networks with a regional dimension in East Africa, the following are the suggested topics for training that should be done by the ENRICH Project:

- Role of collaboration in energy sectors.
- Environmental conservation.

- Policies and support systems and programmes for research and innovation in the energy sectors.
- Investment in research in the energy sector and active participation of stakeholders in the energy value chain.
- Models for coordinating information on incentives, and support mechanism for innovators.
- IP and innovation policy to attach value to research and innovation.
- Horizon 2020 and research funding access, mainly on collaborative international research.

5. Main conclusions from other organisations

5.1 Respondents' additional comments on the Innovation Ecosystem

- Research and innovation in the energy sector is still limited, and as a result the country imports products that may not be tailored to our environment and needs, and thus has a bearing on access and efficiency.
- The country lacks active policies, incentives and support for researchers especially in the areas of energy efficiency.
- The country should benchmark with countries that have succeeded in the above areas and adopt the successful programs that have worked in model countries.
- All actors should play an active role in the energy value chain. Government (through public universities and research institutions) should invest in research; industry should fund direct product development; while CBOs should facilitate dissemination of strategic energy technologies to communities.

- The innovation system should have comprehensive model for coordinating the different actors with incentives for the innovators coupled with a strong system for IPR protection.
- There is also need for creation of fora through which innovative creations that solve societal needs can be exhibited or show-cased, similar to what takes place during science weeks.
- There is need for strong IP and innovations policy to attach value to research and innovation and attract more innovators.
- There is need to raise public awareness and understanding of the ecosystem cycles and innovation. There is little cooperation between the other organizations (Private, government) and higher Education institutions in some aspects such as training on energy related issues, and participation on committee/advisory boards.
- Most of the visited organizations are not aware of some of the existing policies and supporting programs on energy issues.
- There is lack of established STI support on energy issues in most of the visited organizations.

5.2 Recommended actions on Innovation Ecosystem for East Africa

Kenya:

The National Innovation System (NIS) is a set of functioning institutions, organizations and policies, which interact constructively in pursuit of a common set of socio-economic goals and objectives. To achieve a revamped and re-invigorated National Innovation System, Kenya needs a policy framework that should be implemented along four strategic thrusts.

- The institutional re-engineering, which will focus on filling in the policy formulation and implementation gaps as well as addressing the implementation weaknesses inherent in the current NIS.
- The strategic resource mobilization, which will focus on harnessing the resources (2% of GDP), needed to support the mainstreaming of ST&I in the Kenyan economy.
- The strategic knowledge and technology governance, which will focus on the generation and management of Intellectual Property Rights; technology development, transfer and diffusion as well as modernization and utilization of indigenous resources, practices and knowledge.
- The cross-cutting issues, which will focus on strategic partnerships for enhanced ST&I linkages and collaboration; gender mainstreaming; integrating environment and natural resources management and application of effective public communication and advocacy for ST&I.

Tanzania:

- Enhance the use of renewable energy in areas which are not connected to nation electricity grid.
- Promote the use of energy saving cooking stoves in order to preserve the environment.
- Research and projects related to energy conducted in universities and colleges should be promoted, developed and commercialized.
- The government of URT should prioritize research and innovations activities.
- The industries should corporate with HEIs in conducting research, innovation and also knowledge exchange.

Uganda:

- Uganda should develop and widely disseminate priority research areas in the fields of energy access and efficiency.
- Policies and support systems and programmes for research and innovation in the energy sector should be widely disseminated.
- All actors should play their roles in the energy value chain.
- Government should invest in research in the energy sector.
- A comprehensive model for coordinating information on incentives, and support mechanisms for the innovators should be developed and widely disseminated.
- Information on existing innovations and energy initiatives should be shared regularly using all possible fora.
- There is need for strong IP and innovations policy to attach value to research and innovation and attract more innovators.

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