

# AFRICALICS

THE AFRICAN NETWORK FOR ECONOMICS OF LEARNING, INNOVATION,  
AND COMPETENCE BUILDING SYSTEMS

## Mapping Africa's research capacity in the field of innovation and development

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The AfricaLics baseline report

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## I. INTRODUCTION

This report presents the findings of a study mapping research capacities in Africa in the field of innovation and development. The purpose of the study was to gather and synthesise quantitative and qualitative information on research outputs and training activities in this field that can be used both as basis for developing a research agenda for AfricaLics, as well as a background for setting baseline indicators for the AfricaLics project (“Enhancing research capacity on Innovation and Development in Africa through building the African Network on Learning, Innovation and Competence Building Systems”) supported by Sida.

This report is largely based on the results of an online survey distributed to a database of African scholars, researchers and practitioners, located in organisations both in and out of Africa. The survey relied largely on individuals connected to GlobeLics and AfricaLics networks, whilst trying to reach out to a broad representation, with individuals at various stages of their careers and in diverse geographical locations, in order to attain a representative overview of relevant teaching and research activities in the field of innovation and development. To complement the information obtained through the online survey, the study also relied on secondary sources of information (such as reports and websites) which provided additional information related to institutions, publications and training programmes in Africa.

The field of innovation and development has gained relevance in connection to Africa. The field remains largely identified with economics<sup>1</sup>, although important contributions from other disciplines in the advancement of the understanding of innovation are starting to become more visible<sup>2</sup>. It is critical to recognise that innovation is a very diverse scientific field, and having a broad perspective appears to be central to our ability to push the inter-disciplinary boundaries of innovation studies in such a way that collectively contributes to address the complex issues in the African continent. In this study we tried to engage researchers and practitioners that identify themselves with the field of innovation studies, with backgrounds in social sciences, humanities and natural sciences alike; affiliated not only to universities, but also in research organisations, NGOs, government agencies and private sector.

### Pilot study

A pilot online survey was conducted in early March 2012<sup>3</sup>, gathering information about 52 African innovation scholars. This information assisted the initial stages of setting up the AfricaLics network which was launched on the 22<sup>nd</sup> of March 2012 at the “*All African GlobeLics Seminar on Innovation and Economic Development*” in Dar es Salaam, Tanzania. The questionnaire collected the following data:

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<sup>1</sup> Fagerberg and Verspagen (2009) indicate that nearly 60% of the scholars in the field of innovation studies have an economics education; followed by engineering (9%), geography (8%), management (6%) and sociology (5%).

<sup>2</sup> For instance, the latest AfricaLics workshop in Dar es Salaam in 2012 had a clear focus on innovation and engineering.

<sup>3</sup> Conducted by Dr Wamae and Dr Kraemer-Mbula

- Profile of the respondents: name, age, gender, academic discipline and institutional affiliation.
- Interaction and collaborations: institutional collaboration with organization located in and out of Africa, participation in networks, conferences and international events; and names of individual scholars that the respondents interacted with.
- Expectations and future activities for AfricaLics: respondents provided their views on important research themes, activities, suggestions about funding sources and their own participation in AfricaLics.

The pilot survey did not only provided valuable information related to the 52 respondents, but also allowed identifying 122 African and international organisations active in the field of innovation and development. In addition, participants to this pilot survey provided names of up to 10 people with whom they had most regular formal or informal contact about their research over the previous 5 years, resulting in a database of about 200 additional innovation scholars (a proportion of them were African scholars). Also, participants indicated up to 5 ST&I-related events in which they had participated in the previous 5 years that they considered most important for their research. This information was used to expand the original database of African scholars in the field of innovation.

### **Methodology for the larger AfricaLics baseline study**

The survey for the larger baseline study was conducted between September 2013 and January 2014. The data was obtained from two types of sources:

- 1) Primary data collection using an online survey tool:
  - a. The survey tool was prepared in August 2013 and refined through comments from AfricaLics Board members, as well as both AfricaLics and GlobeLics Secretariats.
  - b. It was then distributed by direct email invitation to a list of 263 contacts. A web link to the survey was also made available to several research networks to allow for wider dissemination beyond the list of contacts.
  - c. The initial database was based on the results of the pilot study described above, and substantially enlarged through further search and inputs from AfricaLics Board Members and AfricaLics Secretariat. It is important to note that the survey was based on voluntary submissions from people with whom GlobeLics and AfricaLics have had some contact, and not necessarily comprehensive in coverage. This is an important observation to take into account as results are analysed and interpreted.
  - d. The survey was implemented in two stages, in the period between September 2013 and January 2014, during which several follow-ups took place:
    - i. PART I: collected background information about the researcher, his/her engagement on teaching and supervision, as well as detailed information about research activities and outputs. Part I received a total of 129 responses.
    - ii. PART II: collected information about training programmes and training capacities at African research institutions; linkages and institutional collaborations (inside and outside Africa); as well as sources of funding for research collaborations. Part II received 86 responses.

- 2) Information collected through secondary sources: these are mainly publicly available reports and websites (from universities, ST&I agencies, government departments, etc)

This is a reference document, which provides a summary of the findings and accompanied by a range of appendices containing additional data from various sources.

Following the terms and conditions of the agreement with GlobeLics Secretariat, this report summarises the obtained information related to:

- 1) The profile of African researchers (i.e. the respondents)
- 2) The baseline indicators:
  - Training and teaching programmes on innovation and development in Africa
  - PhD programs and number of PhDs
  - Master programs and number of Masters
  - Publications – record of relevant publications from scholars in the identified network
  - Institutional capacity for ST&I policy, including:
    - Organisations at the national level supporting and promoting innovation and S&T (agencies, councils, etc.)
    - National innovation policy programs/strategies
    - Interaction between universities and industry/society – initial account of formal structures for interaction such as incubators, science parks, etc.
  - Participation in GlobeLics
- 3) The research landscape in Africa:
  - Identifying individuals and organisations on the African continent contributing to research or research training in the field innovation and development, including; (a) independent researchers based on African universities and research organisations; (b) scholars providing courses in African organisations (masters and PhD programmes) related to innovation, science, technology, and development; and (c) think-tanks and other organisations working in the field of innovation, science, technology, and development in Africa.
  - Mapping of the research capacities in different parts of Africa in terms of content of on-going research and number of staff doing research and training programs at the master and PhD level.
  - Mapping institutional collaborations within and outside Africa.

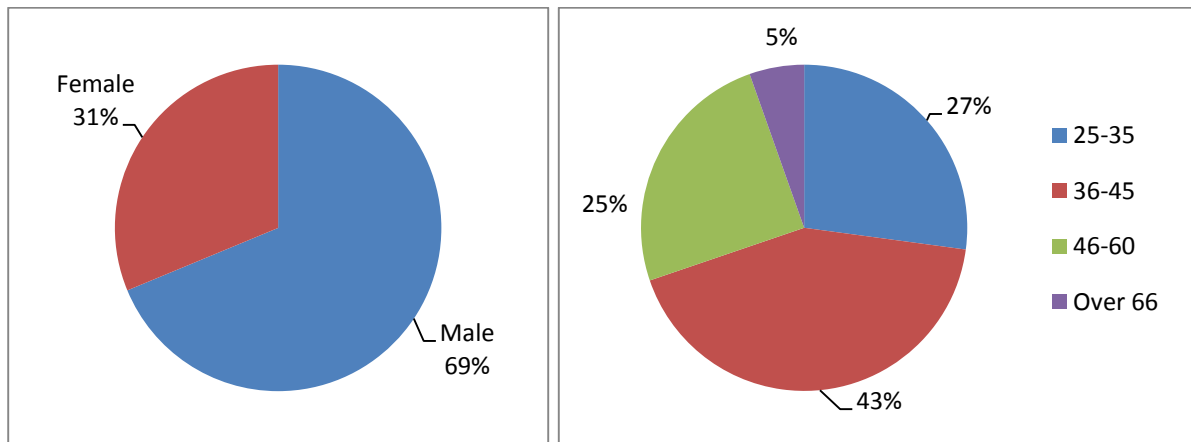
## **II. PROFILE OF AFRICAN RESEARCHERS**

### **1. General description of respondents**

The population of African researchers that responded to this survey was predominantly male and relatively young. Two thirds of the respondents were male and approximately one third was female.

70% were 45 years old or younger, of which 27% fitted into the category of “early career researchers” between 25 and 35 years old, and the majority of respondents (43%) being between 36 and 45 years.

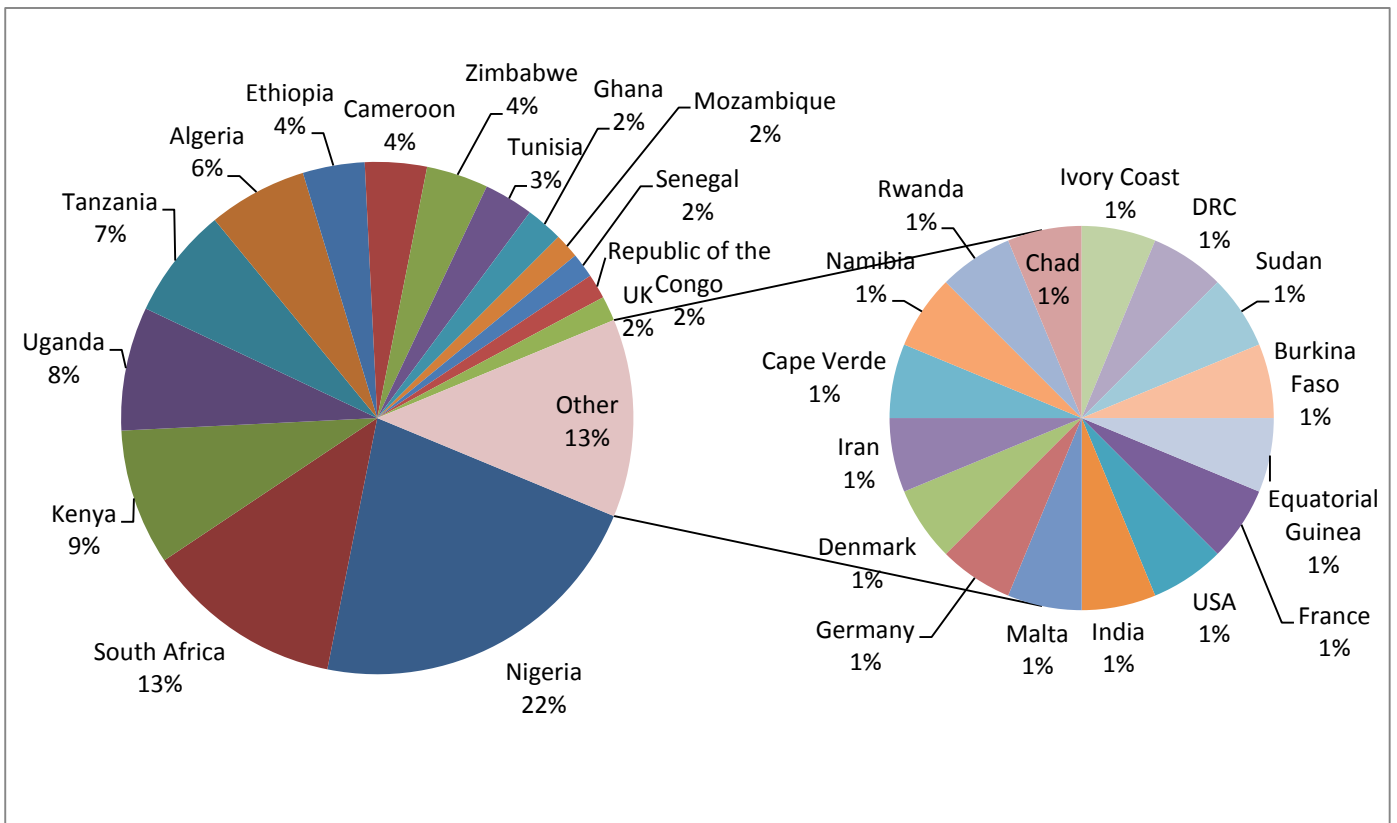
Figure 1: Gender and age profile of respondents



Source: survey Part I, respondents n=129

Regarding the country of origin, the majority of respondents were originally from Nigeria, South Africa, Kenya and Uganda; with these four countries collectively representing more than half of the total sample (52%). 7% of the respondents were originally from outside Africa, including the UK, USA, India, Malta, Denmark, Germany, France and Iran. The sample counted with substantial representation from all regions in Africa, including: North Africa, West Africa, East Africa, Central Africa and Southern Africa. There were also representatives of Francophone, Anglophone and Lusophone African countries. Whilst the survey tried to cover a representative sample of researchers from a range of geographical and disciplinary areas, it must be acknowledged that the population of this survey is composed by individuals and organizations that have some connection to AfricaLics and GlobeLics, therefore other key communities and/or researchers working in the field of innovation and development in Africa may not have been captured in this study.

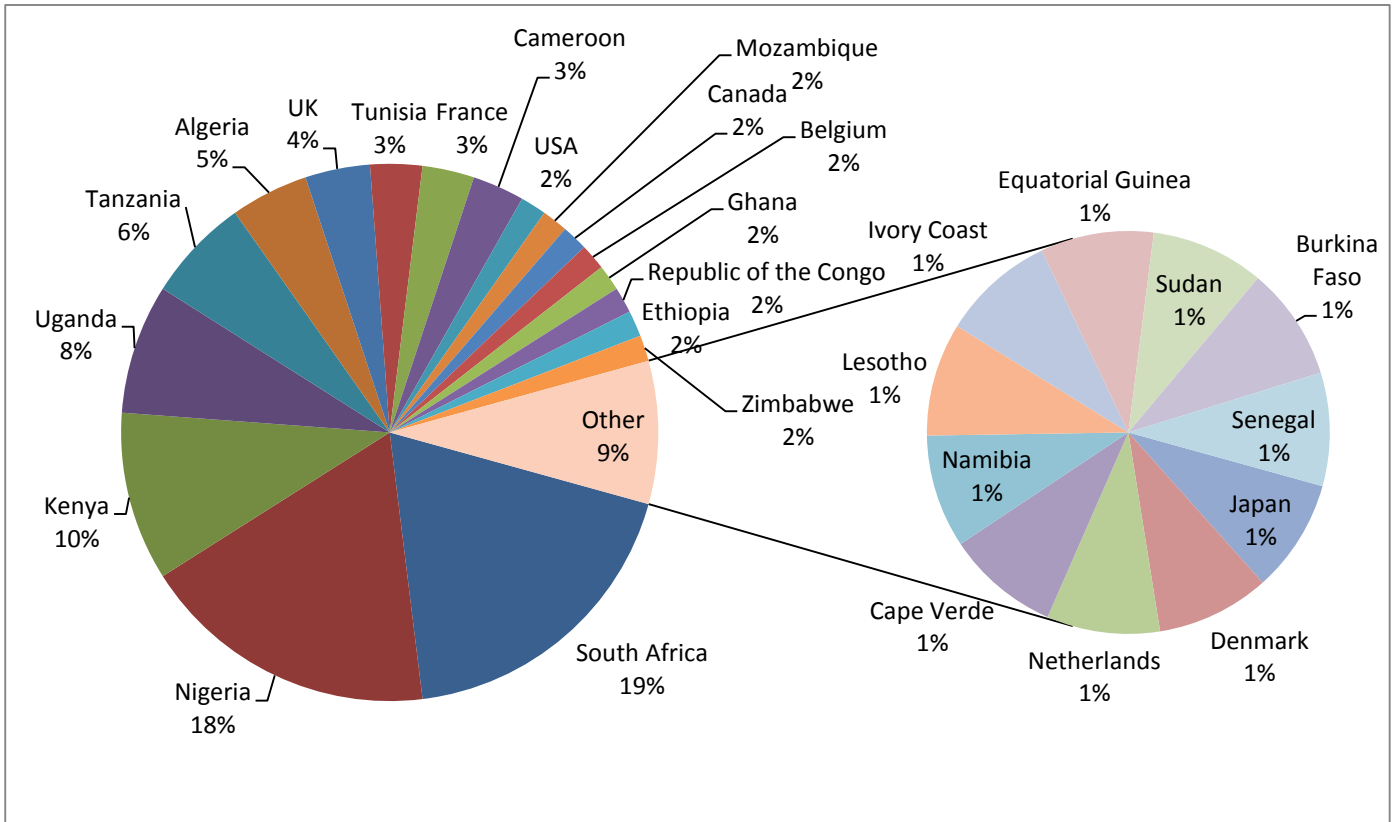
Figure 2: Country of origin of respondents



Source: survey Part I, respondents n=129

In terms of the country of residence, South Africa and Nigeria seem to be by far the most populated countries in terms of ST&I researchers (hosting almost 40% of the respondents to the survey) followed by Kenya, Uganda and Tanzania. 14% of the respondents resided outside of Africa, predominantly in the UK, France, USA, Canada and Belgium.

Figure 3: Country of residence of respondents

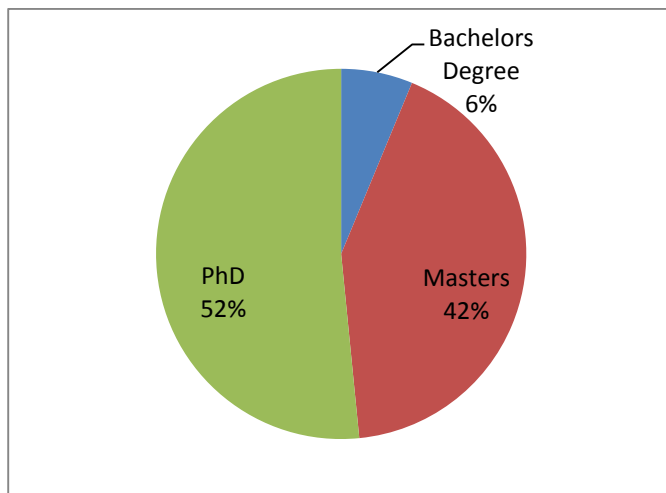


Source: survey Part I, respondents n=129

## 2. Educational profile of respondents

More than half of the respondents (52%) reported to have reached PhD qualification, whilst 42% were actively working with a Master qualification. A small fraction of respondents (6%) had stopped at a Bachelors Degree.

Figure 4: Highest degree obtained



Source: survey Part I, respondents n=129



The majority of respondents (about three quarters) reported to have a background in “Social Sciences”, although there was also substantial representation from Natural Sciences and Engineering (22%). Humanities were the least common background, with only 4% of respondents.

Table 1: Main academic discipline

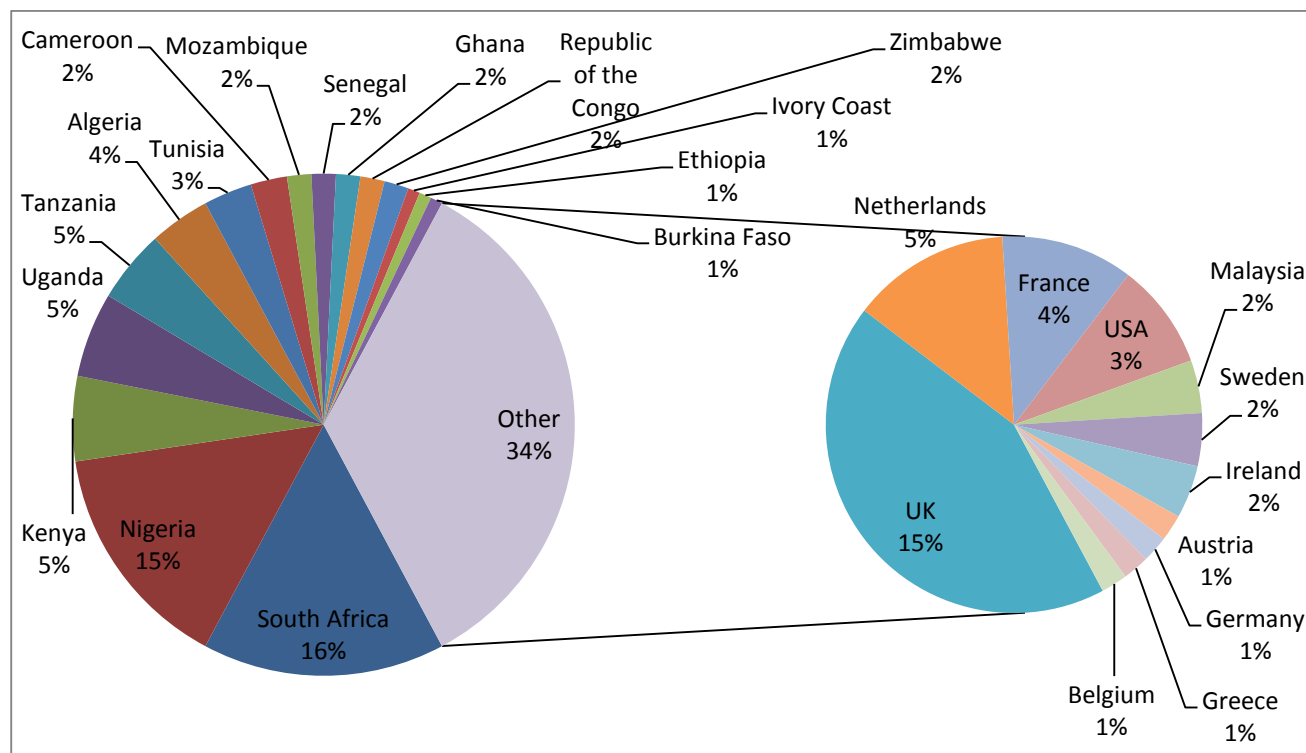
Answer choices	Responses
<b>Social sciences</b>	74%
<b>Humanities</b>	4%
<b>Natural Sciences/Engineering</b>	22%

Source: survey Part I, respondents n=129

Within Social sciences there was a prevalence of Economics, followed by Management, Innovation Studies, Urban Planning, Development Studies, and Political Science. Natural sciences and Engineering included Chemical Engineering, Veterinary, Medicine, Ecology, Mathematics, Biomedical Studies, etc. Humanities included Philosophy, Information Science, Linguistics, etc.

Regarding the countries where degrees were obtained, the majority respondents reported to have obtained their highest degree in Africa – mostly in a South African or Nigerian University (16% and 15% respectively). One third of respondents obtained their highest qualification outside of Africa (34%), most of which were obtained in the UK (15%), Netherlands (5%) and France (4%). Table 2 below lists the reported universities that granted the degrees to the respondents to this survey.

Figure 5: Country where the degree was obtained



Source: survey Part I, respondents n=129

Table 2: Universities where degree was obtained, by country

<b>ALGERIA</b>	<b>REPUBLIC OF THE CONGO</b>
Université d'Oran	Ecole Supérieur de Gestion et d'Administration des Entreprise (ESGAE)
University of Biskra	<b>SENEGAL</b>
University of Bejaia	Université Gaston Berger de Saint-Louis
Tlemcen university	<b>SOUTH AFRICA</b>
Superior National School of Statistics and Applied Economics	University of the Witwatersrand
<b>AUSTRIA</b>	University of Stellenbosch
University of Salzburg, Austria	University of the Western Cape
<b>BELGIUM</b>	University of South Africa
University of Antwerp	Tshwane University of Technology, Pretoria
<b>BURKINA FASO</b>	University of Cape Town
Université de Ouagadougou	University of Pretoria
<b>CAMEROON</b>	University of Natal
University of Yaounde II	University of Johannesburg
<b>ETHIOPIA</b>	University of the Free State
Addis Ababa University	<b>SWEDEN</b>
<b>FRANCE</b>	Blekinge Institute of Technology
University of Lille1	Lund University
Université of Limoges	<b>TANZANIA</b>
University of Perpignan	University of Dar es Salaam
University of Aix-Marseille	Sokoine University of Agriculture (SUA)
BETA - Strasbourg University	<b>TUNISIA</b>
<b>GERMANY</b>	Faculty of Economic Sciences and Management of Tunis
Friedrich Schiller University, Jena	Faculté des Sciences Économiques et de Gestion de Sfax
<b>GHANA</b>	High Institute of Management of Sousse (ISG)
University of Ghana, Legon	University of Tunis & University of Lille Nord de France
<b>GREECE</b>	<b>UGANDA</b>
Agricultural University of Athens	Makerere University/ Blekinge Institute of Technology
<b>IRELAND</b>	Makerere University
University College Cork (UCC)	<b>UNITED KINGDOM</b>
National University of Ireland, University College Dublin	University of Cambridge
<b>IVORY COAST</b>	SOAS University of London
Université Félix Houphouët-Boigny	King's College London
<b>KENYA</b>	SPRU (Science and Technology Policy Research Unit), University of Sussex
University of Nairobi	The Open University
Moi University	Institute of Development Studies, University of Sussex
Institute for Development Studies, University of Nairobi	Liverpool School of Tropical Medicine
Jomo Kenyatta University of Agriculture and Technology	University of Sussex
<b>MALAYSIA</b>	University of Edinburgh
University of Malaya	University of London
International Islamic University Malaysia	Imperial College, London University

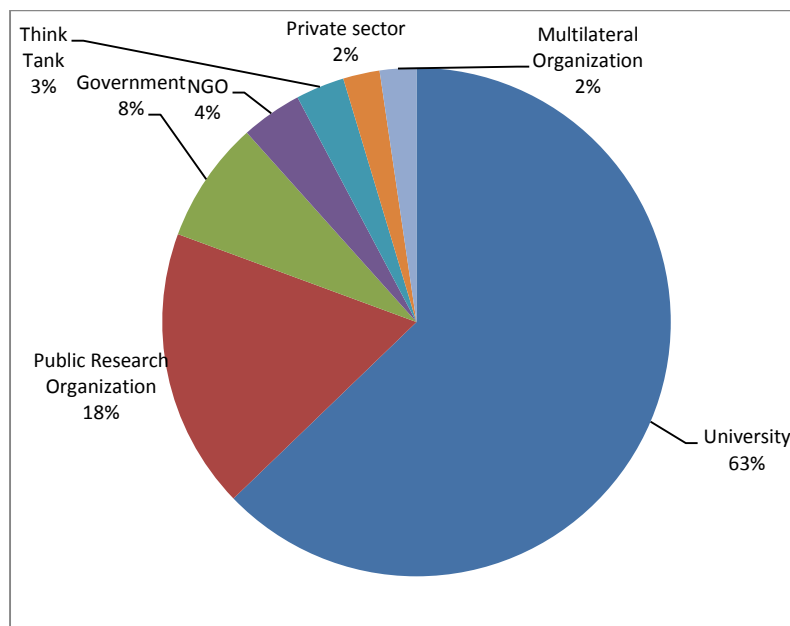
<b>MOZAMBIQUE</b>	University of Ulster Glasgow University University of Portsmouth
Univerdidade Eduardo Mondlane Eduardo Mondlane University	University of Bath University of Oxford
<b>NETHERLANDS</b>	<b>USA</b>
Delft University of Technology UNU-MERIT, Maastricht University University of Twente Wageningen University Free University Amsterdam	Florida Agricultural and Mechanical University Ball State University Michigan State University Rutgers, State University of New Jersey
<b>NIGERIA</b>	<b>ZIMBABWE</b>
University of Port Harcourt in conjunction with University of Pretoria Usmanu Danfodiyo University Sokoto, Nigeria Obafemi Awolowo University, Ile-Ife, Nigeria University of Ibadan Nursing and Midwifery Council of Nigeria University of Ilorin University of Port Harcourt, Nigeria Ladoke Akintola University of Technology	University of Zimbabwe

Source: survey Part I, respondents n=129

### 3. Institutional affiliation

Figure 6 below shows that the majority of respondents were affiliated to a University (63%). However, the survey also collected information for researchers located in public research organisations, NGOs, think tanks, government agencies, private sector and multilateral organisations.

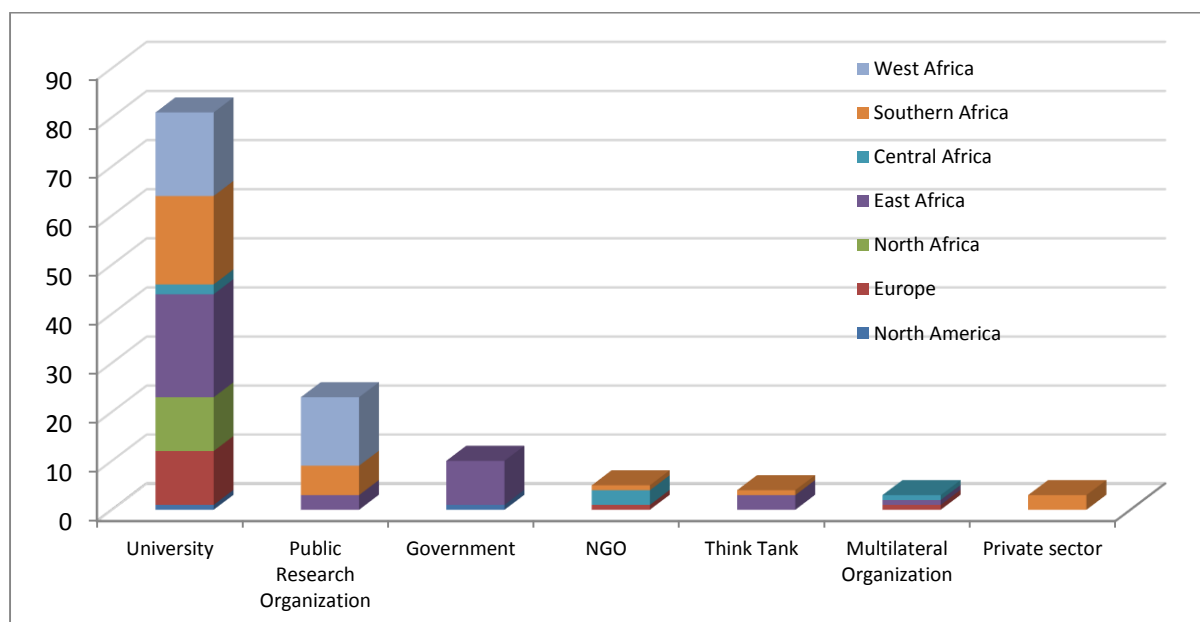
Figure 6: Institutional affiliation, by type of organization



Source: survey Part I, respondents n=129

All African regions (North, East, West, Central and Southern Africa) were represented, in terms of university affiliations. Public research organisations were mostly from West Africa and Government agencies from East Africa. Further efforts need to be done in terms of increasing the coverage of organisations beyond universities. However, the results also reflect a reality in Africa, in which the ST&I is largely research-based, and concentrated universities, with a smaller role being played by other actors in the innovation system.

Figure 7: Distribution of respondents, by institutional affiliation and location of their institution



Source: survey Part I, respondents n=129

Think tanks are defined as public policy research, analysis and engagement institutions that generate policy-oriented research, analysis and advice on domestic and international issues that enable policymakers and the public to make informed decisions about public policy issues (McGann, 2008).

According to the '2013 Global Go To Think Tank Index Report' (MCGann, 2014), out of the 6,826 think tanks in the world, less than 9% are located in Africa. However, South Africa (with 88 think tanks), Kenya (with 57), Egypt (with 55) and Nigeria (with 51) are amongst the top 25 countries with the highest number of think tanks. It is interesting to note that 7 out of the 10 'Best new Think Tanks' are located in developing countries, of which 4 are in Africa.

This study identified several think tanks *explicitly* dedicated to ST&I issues, including<sup>4</sup>:

- African Centre for Technology Studies, Kenya
- African Technology Policy Network (ATPS) (Kenya)
- Science, Technology and Innovation Policy Research Organization (STIPRO), Tanzania

<sup>4</sup> This list does not intend to be comprehensive, but provide a few examples of think tanks based on the information obtained through the online survey, as well as existing reports. A list of the 'Top 50 Science and Technology Think Tanks' and the 10 'Best new Think Tanks' identified by the 2013 Global Go To Think Tank Index Report (MCGann, 2014) is provided in Annex I.

- Science and Technology Policy Research Institute (STEPRI), Ghana
- Research ICT Africa (RIA), South Africa
- Tanzania Commission for Science and Technology (COSTECH), Tanzania

Other think tanks with a component or interest in ST&I issues, are:

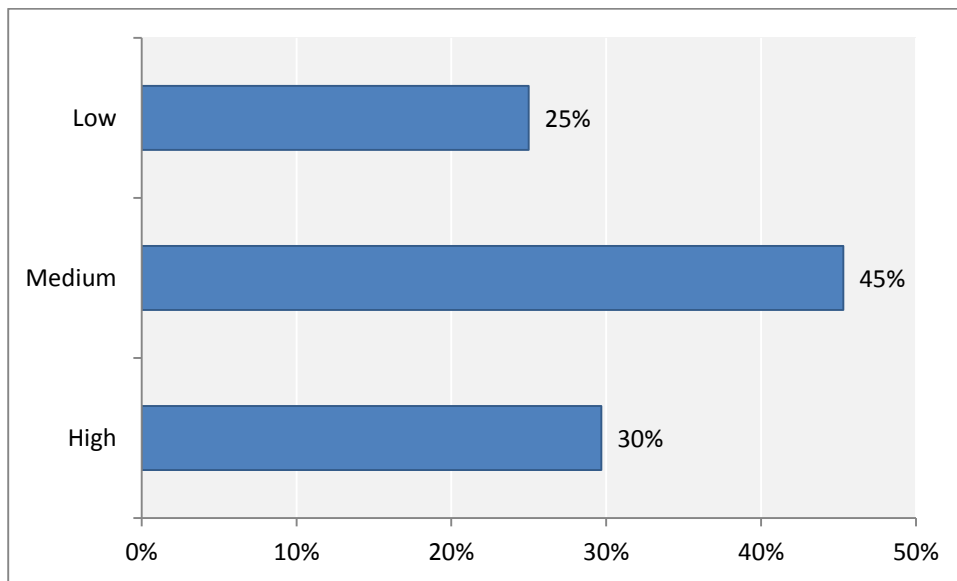
- African Centre for Economic Transformation, Ghana
- AISA – Africa Institute of South Africa, South Africa
- MISTRA – Mapungubwe Institute for Strategic Reflection, South Africa
- South African Cities Network (SACINet), South Africa
- Centre for Development and Enterprise, South Africa
- South African Institute of International Affairs, South Africa
- South African Node of the Millennium Project, South Africa

This study also tried to capture the ‘level of seniority’ of respondents, according to their described position. Whilst this classification may not accurately reflect the responsibilities that each individual takes in his/her daily job, it gives us an indication of the profile of the respondents and the stage in which they are in their careers.

High	Medium	Low
Director	Associate professor	PhD student
Professor	Research officer	Junior researcher
Owner/managing director	Research fellow	Master student
Head of Department	Programme officer	Assistant lecturer
Senior official	Programme leader	
CEO	(Senior) Lecturer	
	Research associate	

The results indicate that the majority of respondents had a ‘medium’ level of seniority (45%), followed by high (30%) and low (25%). It is interesting to note that in some cases respondents with medium levels of seniority would simultaneously be conducting their PhD. Therefore, indicating that there is not always a clear cut between these categories. In fact, 33% of the respondents reported to be conducting their PhDs at the time of the survey. This is probably a reflection of the ongoing expansion of higher education in the continent. The opportunities and risks (in terms of quality of education) of such expansion deserve closer attention.

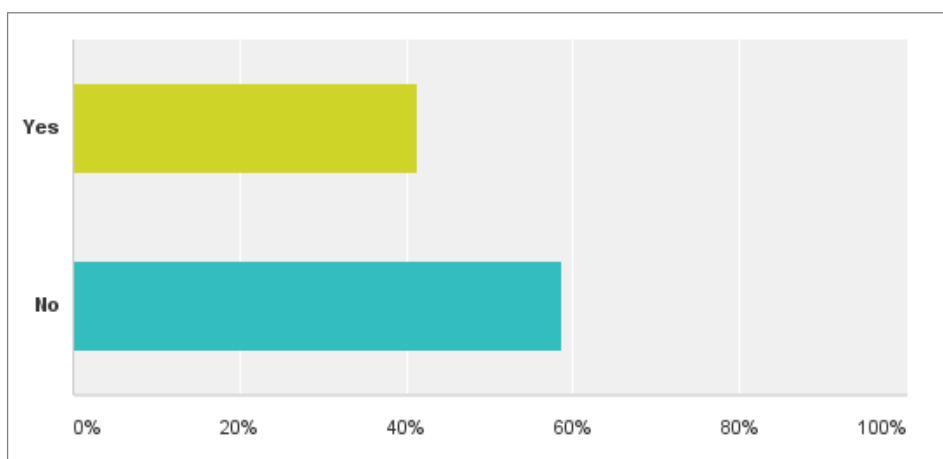
Figure 8: Level of seniority/responsibility in his/her organization



Source: survey Part I, respondents n=129

Over 40% of the respondents had additional affiliations giving an indication of the complexity of measuring the level of seniority on the basis of the affiliation with one institution. For instance, a respondent acting as a senior programme manager in a Government agency (with medium level of seniority, responsible of budget allocations and other decision-making activities), may be completing his/her PhD in another university (associated to a low level of seniority). Multiple affiliations in African researcher are often a reflection of the multiple roles and multiple levels of responsibilities that are acquired by the scarce pool of qualified researchers in the field of innovation and development.

Figure 9: Do you have other current institutional affiliations?



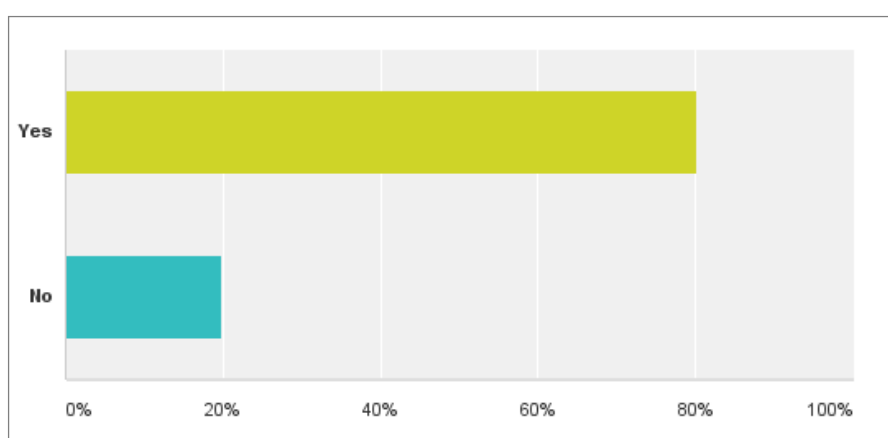
Source: survey Part I, respondents n=129

### III. BASELINE INDICATORS

#### 4. Training and teaching programmes on innovation and development in Africa

A large proportion of the respondents to the survey (80%) indicated that the organisation to which they were affiliated offered some type of training and teaching programme on innovation and development. The existence and proliferation of such training programmes in Africa is a positive indication of a growing academic community in this scientific field.

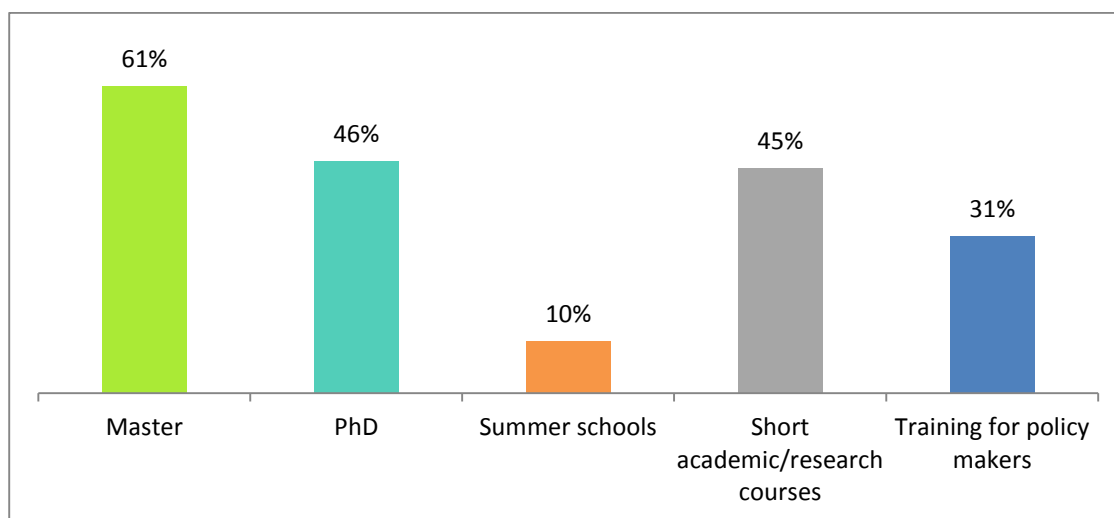
Figure 10: Does your organisation offer training and teaching in the field of innovation and development?



Source: survey Part II, respondents n=86

Amongst those that responded affirmatively, Master programmes appeared to be the most frequent type of training offered, followed by PhDs, short academic /research courses and training courses for policy makers. In those cases where the respondent was directly involved in the training/teaching activities, additional details about the course were provided – name of the programme, type of programme, name of accrediting institution, number of students, frequency & length of the course.

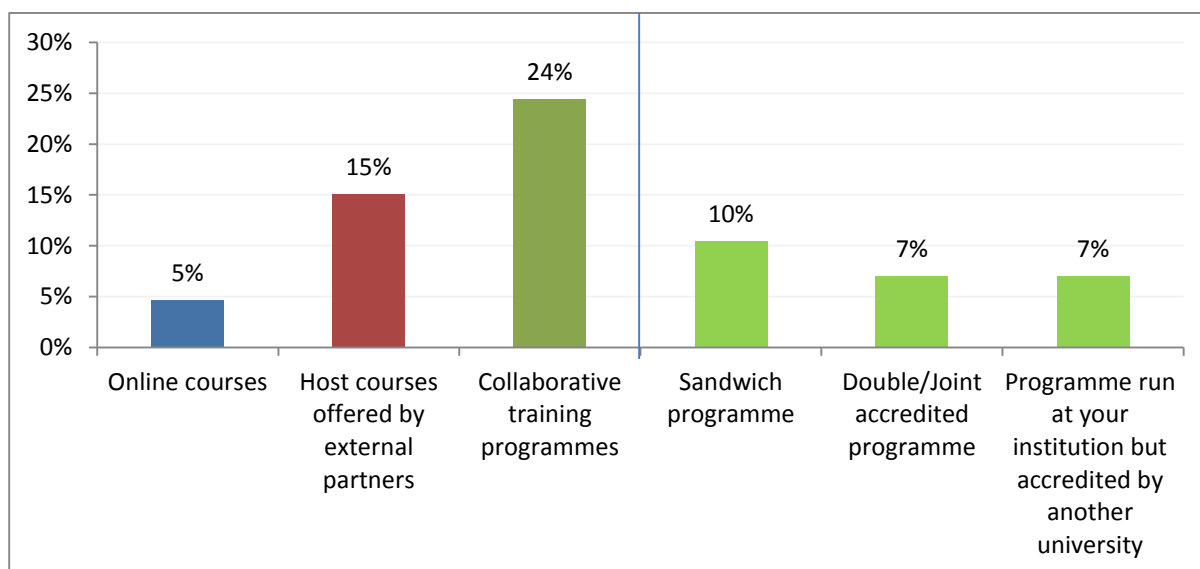
Figure 11: Type of training offered in African institutions, by content and length



Source: survey Part II, respondents n=86

Only 5% of the respondents indicated that their organisation offered on-line courses, 15% hosted courses that were fully offered by external partners, whilst 24% of the respondents reported their organisations to be engaged in collaborative training programmes – out of which sandwich programmes were the most frequent (10%).

Figure 12: Type of training offered in African institutions, by role of the host



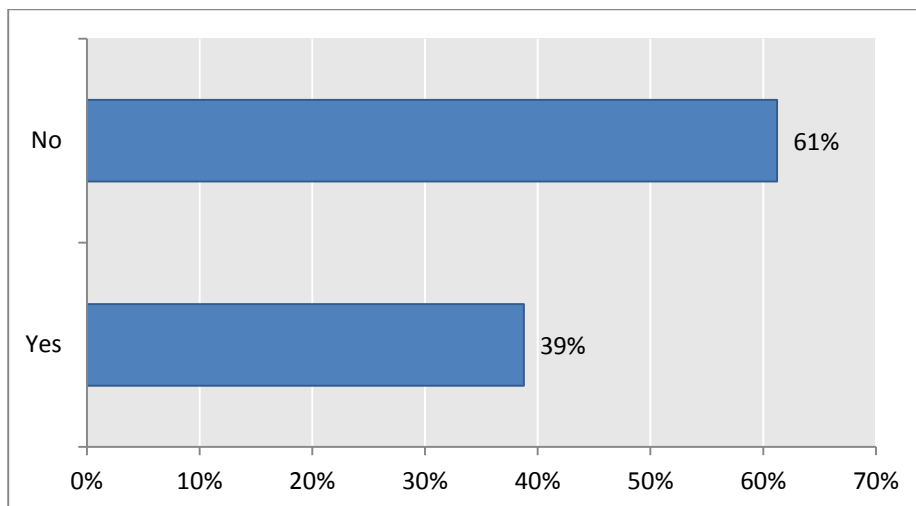
Source: survey Part II, respondents n=86

The strong linkages between supervisors and their students are an important ingredient for the development of an academic community in any field. About 40% of the respondents reported to be involved in supervision either at the Master or PhD level, with an average amount of 8.9 Master students per supervisor, and 1.4 doctoral students per supervisor. The number of doctoral students per supervisor remains rather low compared to Masters and indicates that the community of



innovation scholars is growing albeit slowly. Nevertheless, scholars providing supervision at the PhD level had obtained their degree an average of 10 years prior to the time the survey was conducted, signalling their long-term commitment to capacity building; and the majority of them (80%) reside in Africa. This evidence indicates the strong although slow-paced linkages that are being forged in the African innovation community.

Figure 13: Do you conduct supervision at the Masters of PhD level?

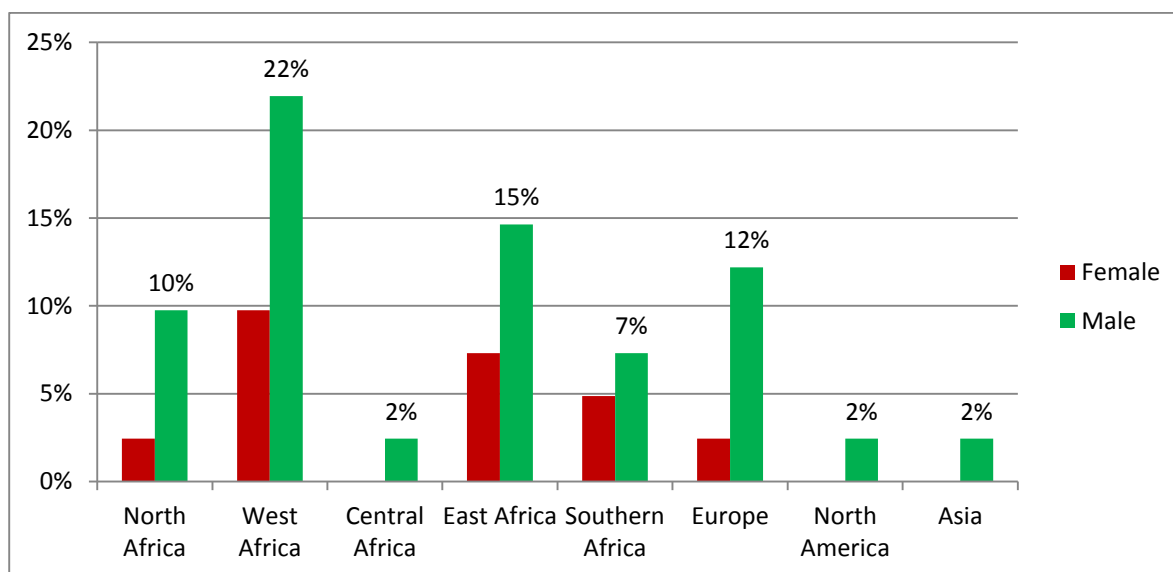


Source: survey Part I, respondents n=129

## 5. PhD programmes and students

41 of the respondents to the survey (31% of the total respondents) were PhD students, completing their PhD in various countries. Only 27% were female, a reflection of the remaining gender biases afflicting higher education in Africa. The average age of the respondents that were enrolled in a PhD programme was 37 years old. The majority of respondents were registered in PhD programmes in West Africa (mainly Nigeria), East Africa (mainly Kenya and Tanzania), and Europe (including the UK, Germany, Belgium, Netherlands and France). However, the survey also identified PhD students registered in other African countries.

Figure 14: Gender profile of PhD students, according to regional location of PhD programme



Source: survey Part I, respondents n=129

The study gathered information about PhD programmes related to innovation and development in 14 African countries. The identification of these programmes was based on the information provided by the students and supervisors affiliated to these PhD programmes – the information provided was complemented with a desk-based search. This list does not intend to be comprehensive or to cover all existing PhD programmes in Africa, but rather identify those programmes that host scholars who identify themselves with the field of innovation and are connected to the conducted survey.

Unsurprisingly, the majority of PhD programmes fall into “Social Sciences” and particularly in the fields of Economics, Technology Management, Development Studies, and Innovation Studies. However, there are some innovation-related PhD programmes in Humanities, such as Education Studies, Information Sciences and Philosophy, as well as Natural Sciences (Telecommunications, Food Science, Chemical Engineering, ICTs, etc). It is important to note that out of the 61 identified PhD programmes in Africa that have trained scholars who identify themselves with the field of innovation, only 7 of those 61 PhD programmes (11% of the total) provide training exclusively in the field of innovation and technology management – these are: (a) PhD programmes in Technology & Innovation Management, three in Nigeria, one in Tanzania and one in South Africa; (b) one PhD programme in Science and Technology Studies in South Africa; and (c) one PhD programme in Agricultural and Rural Innovation in Uganda. Moreover, many of these seven ST&I-focused PhD programmes are relatively new and small in terms of enrolments. As a result, most African innovation scholars and researchers have received training in PhD programmes related other social sciences (Economics, Management, Development Studies, etc), humanities (6 PhD programmes) and Natural Sciences (13 PhD programmes), finding then their own specialisation in ST&I. This gives us an indication of how dispersed the research community is and the need for specialised PhD programmes in the field of innovation studies.

Table 3: PhD programmes related to innovation and development, by country and discipline

	Social sciences	Humanities	Natural sciences/Engineering
<b>Algeria</b>			
University of Bejaia	PhD in Management		
Département des Sciences de Gestion, Abou Bakr Belkaid University of Tlemcen	PhD in Human Resources Management		
Superior National School of Statistics and Applied Economics	PhD in Economics and applied Statistics		
University of Biskra	PhD in Economics and Management		
<b>Burkina Faso</b>			
Department of Economics, University Ouaga	PhD in Economics		
<b>Cameroon</b>			
Université de Yaoundé II	PhD in Economics		
<b>Ethiopia</b>			
Adama Science and Technology University	PhD in Economics		
<b>Ghana</b>			
University of Ghana, Legon			PhD in Soil Science
Ghana Technology University College	PhD in Business Administration		PhD in Information and Communications Technology (ICT) PhD in Telecommunications Engineering
Kwane Nkrumah University of Science and Technology	Economics		PhD in Food Science and Technology
<b>Ivory Coast</b>			
University Felix Houphouet Boigny Cocody	PhD in Economics		
<b>Kenya</b>			
University of Eldoret			PhD in Ecology

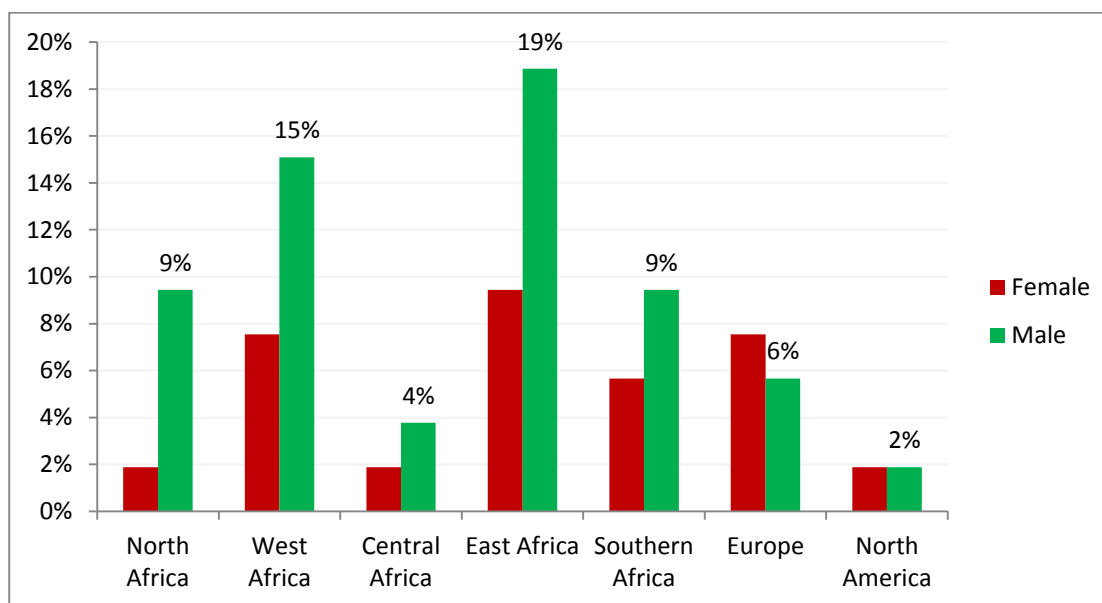
The Institute for Development Studies, University of Nairobi	PhD in Development Studies		
Moi University	PhD in Agricultural Economics PhD in Socio-Economics		PhD in Natural Resource Management
Jomo Kenyatta University of Agriculture and Technology			PhD in Food Science and Nutrition
<b>Nigeria</b>			
University of Port Harcourt / University of Pretoria	PhD in Technology Management Economics		PhD in Eco-innovation
African Institute for Science Policy and Innovation, Obafemi Awolowo University, Ile-Ife.	PhD in Management		
Obafemi Awolowo University, Ile-Ife	PhD in Technology Management PhD in Public Administration PhD in Development planning PhD in Development economics PhD in Public finance	PhD in Education studies	PhD in Chemical Engineering
Department of Agricultural Extension and Rural Development, University of Ibadan	PhD in Agriculture and Rural Development		
University of Ibadan		PhD in Philosophy & African Knowledge Systems PhD in Information Sciences	
Institute of Engineering, Technology and Innovation Management, University of Port Harcourt	PhD in Technology and Innovation Management		
Usmanu Danfodiyo University Sokoto	PhD in Economics		
University of Ilorin	PhD in Agricultural Economics		
<b>Senegal</b>			
Université Gaston Berger	PhD in Sociology		
University Gaston Berger/ University of Orleans	PhD in Economics		
<b>South Africa</b>			

Centre for Research on Evaluation, Science and Technology, University of Stellenbosch	PhD on Monitoring and Evaluation Studies (M&E) PhD on Science and Technology Studies		
Wits Business School, University of the Witwatersrand	PhD in Economics PhD in Management PhD in Social Sciences		
University of Cape Town	PhD in Applied Economics	PhD in Museums and Heritage	
University of the Western Cape	PhD in Economics		
University of the Free State	PhD in Social Sciences		
The Da Vinci Institute of Technology Management	PhD in Management of Technology and Innovation		
<b>Tanzania</b>			
College of Engineering and Technology, University of Dar es Salaam	PhD in Technology management		PhD in Engineering
University of Dar es Salaam	PhD in Economics		
<b>Tunisia</b>			
Unité de Recherche en Economie du Développement, Faculté des Sciences Economiques et de Gestion de Sfax, Université de Sfax	PhD in Economics		
ISG Sousse/IAE Lille; University of Sousse/University of Lille1	PhD in Management		
<b>Uganda</b>			
Mbarara University of Science and Technology			PhD in Information Technology
Institute of Interdisciplinary Training and Research (IITR) - Mbarara University of Science and technology	PhD in Interdisciplinary Studies		
Makerere University - Makerere University College of Agricultural and Environmental Sciences (CAES)	PhD in Agricultural and Rural Innovations		PhD in Food Science and Technology
<b>Zimbabwe</b>			
University of Zimbabwe	PhD in Urban Planning	PhD in Museums and Heritage PhD in Information systems	PhD in Computer Sciences

## 6. Master programmes and students

54 respondents indicated that their highest qualification obtained at the time of the survey was a Master Degree (42% of respondents); about half of which were pursuing a PhD. In most cases, the Masters degree had been granted by an African University (80% of them), with nearly one fifth of the Masters been granted in East Africa, followed by West Africa with 15%. Although female representation appears to be higher in Master Degrees, as compared to PhDs, there is still an evident gender imbalance in research capacities in ST&I in Africa.

Figure 15: Gender profile of respondents and region where the Master Degree was granted



Source: survey Part I, respondents n=129

The survey gathered information about Master programmes with a component of innovation and development in 15 African countries. Most Master Degrees identified were in Social Sciences, in particular Economics, Management, and Development Studies. Similarly to the case of PhD programmes, out of the 48 identified Masters programmes that have trained scholars who identify themselves with the field of innovation studies, only 8 of those programmes appeared to be explicitly dedicated to innovation, and technology management – and where located mostly in South Africa, where 5 of these Masters Programmes are offered. Therefore, we find a considerable number of Masters Programmes across Africa with a component of innovation, mainly weaved within offerings in Economics, Management and Business Administration. This is again one indication of the need for further specialisation in postgraduate studies in the field of innovation in Africa.

Table 4: Master Programmes related to innovation and development, by country and discipline

	Social Sciences	Humanities	Natural sciences/Engineering
<b>Algeria</b>			
Oran University	Master in International Economics and Innovation Management		
University of Bejaia	Master in Management		
University of Tlemcen	Master in Management		
Superior National School of Statistics and Applied Economics,	Magister in Economics and Applied Statistics		
<b>Burkina Faso</b>			
Université de Ouagadougou	MA in Economics		
<b>Cameroon</b>			
University of Yaounde II	MA in Economics		
<b>Ethiopia</b>			
Addis Ababa University	Masters degree in Economic Policy Analysis		
<b>Ghana</b>			
Kwame Nkrumah University of Science and Technology	MA in Economics		MSc and MPhil in Food Science and Technology
University of Ghana	MPhil in Economics		
<b>Ivory Coast</b>			
University Felix Houphouet Boigny Cocody	MA in Economics		
<b>Kenya</b>			
Institute for Development Studies, University of Nairobi	M. A. in Development Studies		
Moi University	Master in Economics Master in Agricultural Resource Master in Economics and Management Master in Development Studies		Master of Philosophy in Zoology (Ecology Option)

	Master in Human Resource Development Studies		
University of Nairobi			MSc in Meteorology
Jomo Kenyatta University of Agriculture and Technology			Master of Science in Food Science and Technology
<b>Mozambique</b>			
Eduardo Mondlane University			Master in Agronomy
<b>Nigeria</b>			
Obafemi Awolowo University	MSc in Technology Management		MSc in Environmental Science Master of Science in Geography
University of Ibadan	MSc in Agriculture and Rural development		
<b>Republique of Congo</b>			
Ecole Supérieur de Gestion et d'Administration des Entreprise (ESGAE)	Master in Business Administration		
<b>Senegal</b>			
University Gaston Berge	MA in Economics		
<b>South Africa</b>			
Institute for Economic Research on Innovation, Tshwane University of Technology	Master in Comparative Local Development		
Wits Business School, University of the Witwatersrand	Master in Innovation Management Master of Management in Entrepreneurship and New Venture Creation Master in Business Administration		
Centre for Research on Evaluation, Science and Technology, University of Stellenbosch	MPhil on Monitoring and Evaluation Studies (M&E) MPhil on Science and Technology Studies		

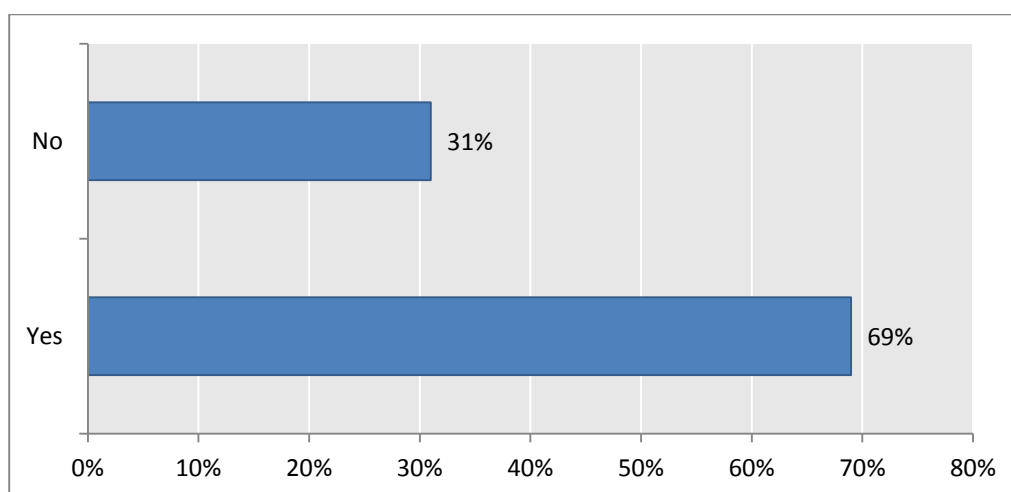


	(Specialisation in research uptake and utilisation)		
University of Cape Town	MA in Innovation Studies Master of Philosophy (MPhil) specialising in Inclusive Innovation		
University of Pretoria	MSc Technology Management MBA Master of Business Administration (offered by GIBS)		
University of Natal			MSc in Agricultural Science
Unisa		MA Degree in Research Psychology	
<b>Uganda</b>			
Makerere University	MSc Technology Innovation and Industrial Development Masters in Economic Policy and Planning		MSc in Food Science and Technology MSc. Molecular Biology & Biotechnology
Institute of Interdisciplinary Training and Research (IITR) - Mbarara University of Science and technology	M.A in Development Studies		
<b>Tanzania</b>			
Sokoine University of Agriculture (SUA)	MSc. in Agricultural Education and Extension		
University of dare s Salaam	Master in Engineering Management		
The Nelson Mandela African Institution of Science and Technology (NM-AIST)	Master on Innovation, Technology Management and Entrepreneurship (ITME) - <i>being developed</i>		
<b>Tunisia</b>			
High Institute of Management of Sousse (ISG), University of Sousse	Master in Management		

## 7. Publications

The community of African scholars and researchers that identify themselves with the field of innovation and development appears to be active authors, since nearly 70% of the respondents reported to have published in the last 5 years. 30% reported to have not published in the last 5 years, of which nearly half were PhD students and one third were practitioners working in NGOs, government departments and the private sector; who usually have a lower propensity to publish as compared to established scholars working in a university environment.

Figure 16: Have you published in the field of innovation and development in the last 5 years?



Source: survey Part I, respondents n=129

Through the survey, this study identified the following publications by African scholars and researchers in the field of innovation and development for the period 2008/2009 to 2013/2014:

- 23 books
- 44 book chapters
- 147 journal articles
- 40 Working Papers
- 13 policy briefs and opinion articles
- 87 conference papers

Only 2 out of the 23 books were published by African publishers. The large majority of books were published in Europe (mostly UK and Germany: Cambridge, Oxford, Edward Elgar, Routledge, Springer, etc). Similar bias although less pronounced was found in contributions in terms of books chapters. The majority of books and book chapters identified through this survey, addressed areas of particular interest for Africa in the field of innovation and technology development such as: (1) the role of specific groups (women, youth and racial groups), (2) skills development, (3) inequality, (4) institutional development & the role of the state, (5) small enterprises, (6) emerging sectors (biotechnology and ICTs), (7) regional integration & South-South cooperation, (8) poverty & food crisis, and (9) extractive industries. Journal articles appear to be more focussed on specific technologies (e.g. solar technologies, and their assessment, application and diffusion in specific sectors or regions).

Journal articles were published both in African and international journals. The table below lists the journals in which the respondents reported to have published in the last 5 years. It can be noticed that many publications are not in those journals typically associated to innovation and development studies – many of them are in the field of management, medicine, engineering, environmental sciences, etc. Those that were more frequently reported are shaded in pink.

Regarding the scientific quality of the journals in which African innovation scholars publish their work<sup>5</sup>, the table below indicates that only 4 of the 21 “Africa-focused” journals identified in this survey are indexed journals. It is also interesting to note the publishers’ country, whereby about three quarters of Africa-focused journals are published in Africa, predominantly Nigeria. When African innovation scholars publish in “international journals directly related to innovation & development studies”, their representation in indexed journals increases – 13 out of 23 identified journals (56%). When publications are in “international journals on other disciplines”, indexed journals are 28 out of 46 (60%). It is important to note once more, that these results reflect the sample that was reached through this online survey which is to some extent connected to the GlobELics and AfricaLics community.

Table 5: List of journals where African researchers publish their research

Journal name	Country	Indexed
Africa-focused Journals		
African Journal of Science, Technology, Innovation and Development	UK	No
African Journal of Environmental Science and Technology	Nigeria	No
African Education Review	South Africa	No
African Journal of Food Science	Nigeria	No
African Journal of Health Sciences	Kenya	Yes
African Journal of Social Policy and Administration	Nigeria	No
African Journal of Traditional, Complimentary and Alternative Medicines	Nigeria	Yes
Journal of African Review of Economics and Finance	South Africa	No
Journal of African Technology Development Forum	Zambia	No
Journal of Sustainable Development in Africa	USA	No
South African Journal of Economics	UK	Yes
South African Journal of Industrial Engineering	South Africa	Yes
Ethiopian e-Journal for Research and Innovation Foresight (Ee-JRIF)	UK	No
Ethiopian Journal of Environmental Studies and Management	Ethiopia	No
Ife Journal of Behavioural Research	Nigeria	No
Nigeria Journal of Solar Energy	Nigeria	No
Nigerian Journal of Natural Products and Medicine	Nigeria	No
Journal University of Ibadan	Nigeria	No
International Journal of Innovation and Applied Studies	Morocco	No
International Journal of Innovation and Knowledge Management in Middle East and North Africa (IJKMMENA)	UK	No

<sup>5</sup> Indexed journals are considered to be of higher scientific quality as compared to non-indexed journals.

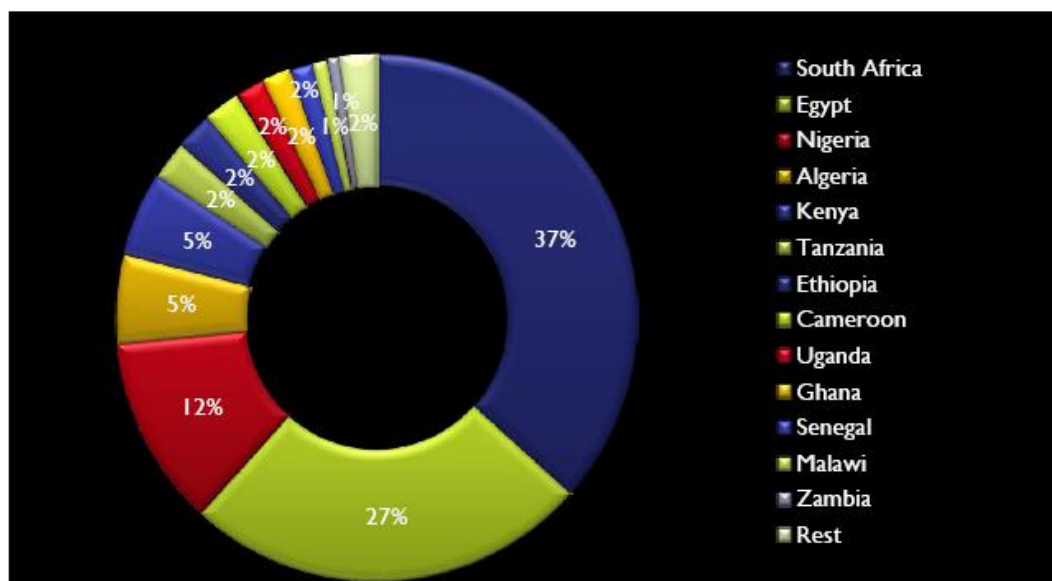
Nigerian Journal of Social and Management Sciences	Nigeria	No
<b>International journals directly related to innovation &amp; development studies</b>		
International Journal of Technological Learning, Innovation and Development	UK	Yes
Science and Public Policy	UK	Yes
Innovation and Development	UK	No
International Journal of Technology Management and Sustainable Development	UK	No
Journal of Science, Technology and Society	India	Yes
Journal of International Development	UK	Yes
Research Policy	Netherlands	Yes
Development	UK	Yes
Technological Forecasting and Social Change	USA	Yes
The Journal of Development Studies	UK	Yes
International Journal of Technology and Development Studies	Netherlands	Yes
International Journal of Technology Analysis and Strategic Management	UK	Yes
International Journal of Technology and Globalisation	UK	Yes
International Journal of Technology Management	UK	Yes
International Journal of Technoscience and Development	Sweden	No
Technovation	UK	Yes
Journal of Science Policy & Governance	USA	No
International Journal of Sustainable Development	UK	Yes
Journal of Technology Management and Innovation	Chile	Yes
Journal of the Knowledge Economy	Germany	Yes
Greener Journal of Science Engineering and Technological Research	Nigeria	No
Journal of Physical Sciences and Innovation	Nigeria	No
Law, Technology and Innovation	UK	No
<b>International journals on other disciplines</b>		
American Journal of Industrial and Business Management	USA	No
Journal of Vector Borne Diseases	India	Yes
Journal of Management	USA	Yes
Agricultural Systems	Netherlands	Yes
American Chemical Science Journal	China	No
Applied Economics	USA	Yes
Environmental Biosafety Research	France	Yes
European Journal of Development Research	UK	Yes
European Journal of Law and Technology	UK	No
Global Meteorology	Italy	No
IAFOR Journal of the Social Sciences	Japan	No
International Journal for Management and Enterprise Development	UK	Yes
International Journal of Business and Management	USA	No

International Journal of Business Environment	Spain	No
International Journal of Business Information Systems	UK	Yes
International Journal of Emerging Technologies and Society	Australia	Yes
International Journal of Entrepreneurship-allied academies	USA	Yes
International Journal of Environmental Science	India	No
International Journal of Institutions and Economies	Malaysia	Yes
International Journal of Research in Education	UK	Yes
International Journal of Science and Nature	India	No
International Journal of Sudan Research (IJSR)	UK	No
International Journal of Tropical Insect Science	UK	Yes
Journal of Agricultural Education and Extension	UK	Yes
Journal of Agriculture, Science and Technology	USA	No
Journal of Chemical Ecology	USA	Yes
Journal of Diplomacy and International Relations	USA	Yes
Journal of Emerging Trends in Economics and Management Sciences	UK	No
Journal of Engineering and Applied Sciences	Pakistan	Yes
Journal of Environmental Research and Policies	Nigeria	No
Journal of Insect Science	USA	Yes
Journal of Life Sciences	Netherlands	Yes
Journal of Meteorology and Related Sciences	Kenya	No
Journal of Nutrition	USA	Yes
Journal of US-China Public Administration	USA	Yes
Malaria Journal	UK	Yes
Minerva: A Review of Science, Learning and Policy	Netherlands	No
Parasites and Vectors	UK	Yes
RECIIS: Electronic Journal of Communication, Information & Innovation in Health	Brazil	No
Resources Policy	UK	Yes
Review of Policy Research	UK	Yes
Scholarly Journal of Mathematics and Computer Science	Nigeria	No
Soil Science Society of America Journal	USA	Yes
The Quarterly Journal of Administration	Nigeria	No
Acarologia	France	Yes
Acta Horticulturae	Belgium	Yes

Source: survey Part I, respondents n=129

It is interesting to contrast this data with a recent bibliometric assessment of 19 African countries, analysing scientific knowledge production on the continent. The results show that South Africa, together with Egypt and Nigeria, produce three quarters of total scientific output on the continent.

Figure 17: Share of individual African countries (top 13) to total output (n=236,567 papers) for the period 1990-2009



Source: Centre for Research on Evaluation, Science & Technology (CREST) report (2013)

Back to our survey, out of the 94 reported conference papers 54% were presented in conferences and events taking place in Africa, mostly in Nigeria (28% of all conference papers) but also in other African countries such as Kenya, Uganda and South Africa. 18% of the conference papers presented by African innovation scholars related to conferences that took place in Asia (mostly China and Malaysia); and 14% related to events taking place in Europe. It must be noted that the conferences and events located in Africa where African innovation scholars do present their work, often do not have an explicit focus on innovation and development. However, the conferences tend to relate to specific topics (e.g. renewable energies, climate change, natural resources, etc) that have some connection with innovation and technology development.

## 8. Institutional capacity for ST&I policy in Africa<sup>6</sup>

This section summarises the findings related to institutional capacities for ST&I in Africa, which is captured by means of three dimensions:

- a) Organisations at the national level supporting and promoting innovation and S&T (agencies, councils, etc.)
- b) National innovation policy programs/strategies
- c) Account of formal structures for interaction between universities and industry, and universities and society (such as incubators, science parks, etc.)

This section makes use of some data published in Nair-Bedouelle et al (2012), which identified key organisations and agencies whose mandate is to promote ST&I in 35 African countries. The results indicate that all countries reviewed, with the exception of Swaziland, have dedicated government

<sup>6</sup> Many of the findings presented in this section have been based on secondary data, including Nair-Bedouelle et al (2012) as well as websites and public reports; and therefore not limited to the responses obtained through the online survey.

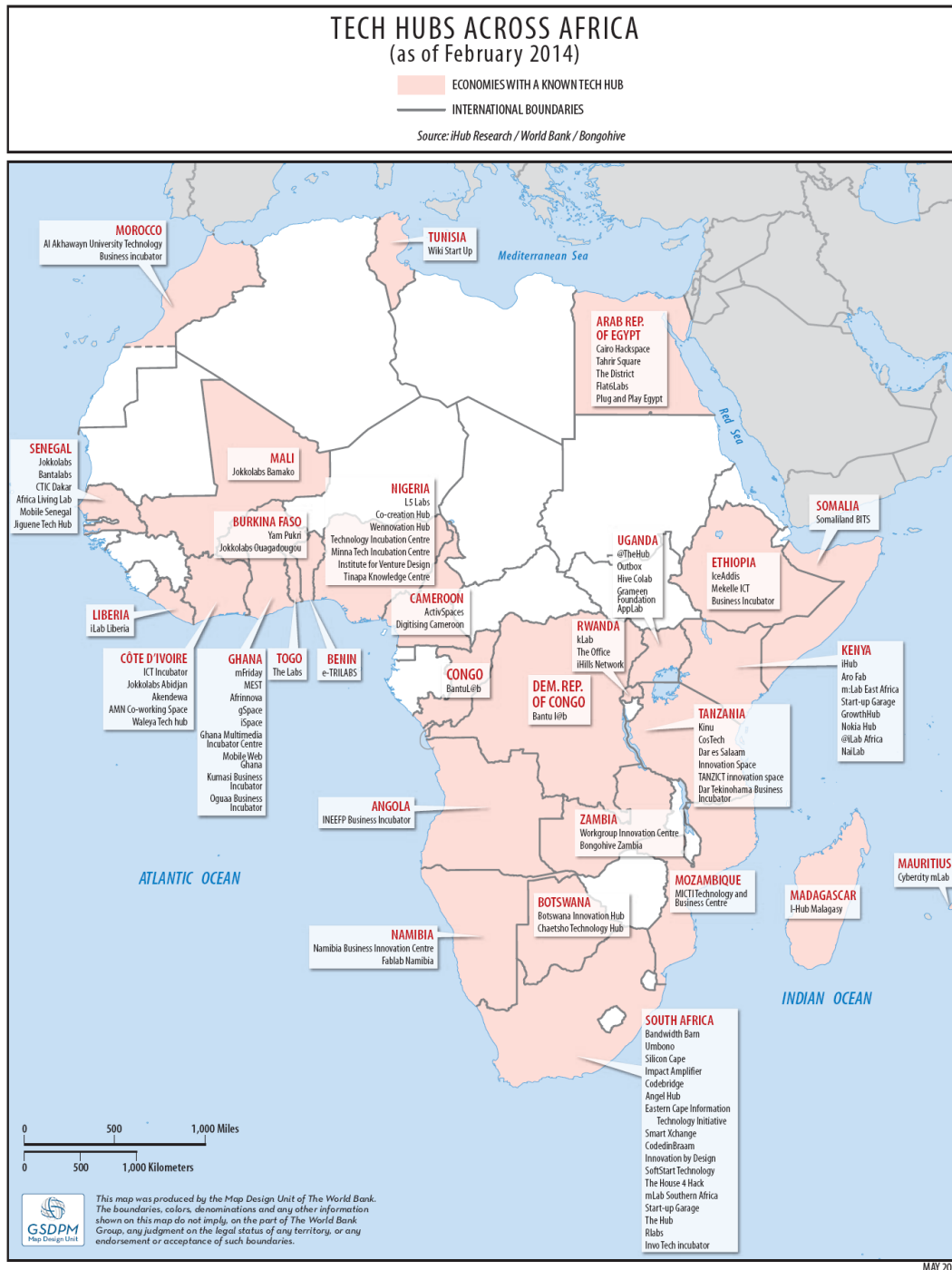
organs for the coordination and promotion of scientific research (and less frequently) innovation activities. The implementation for ST&I lies mainly within the Ministries for Higher Education and Scientific Research.

Southern, Eastern and Northern Africa, there appears to be shared and growing interest in promoting ST&I at an institutional level, which has led to a significant expansion of organizations and bodies mandated with coordinating and supporting R&D and innovation activities, as well as widespread formulation of STI policies and strategies. However, in Western and Central Africa, despite various national laws that exist, few countries have comprehensive and functional ST&I policies. The lack of fully developed national ST&I policies hinders the ability to allocate budgets and pursue identified priorities and goals. Out of 35 countries covered in Nair-Bedouelle et al (2012), only 43% had an explicit national strategy/policy guiding ST&I – and it must be noted that the existence of such policy does not necessarily imply that it is operational. Even when there have been advances in policy formulation, policy implementation has been slow or absent. Poor implementation of policies remains one of the biggest challenges in Africa.

ST&I activities are largely performed by higher education institutions, and also by a range of research institutions (mostly public but also private in some countries). Participation of private enterprises in the ST&I system tends to be limited and their interaction with research taking place in universities is in general very weak. However, there appears to be an increasing interest in the promotion of entrepreneurship and innovation, particularly in SMMEs, providing incentives to encourage innovation by means of programmes such as science and technology parks and business incubators. This study also identified a substantial number of such initiatives that have emerged across Africa – particularly in the area of ICTs.

Technology and innovation hubs are multiplying across Africa. In 2014 it has been estimated that there are around 90 tech-hubs across the continent, with more than half of African countries hosting at least one (iHub Research, World Bank, Bongohive, 2014) – led by South Africa with nearly 20 of them, followed closely by Ghana, Nigeria, Kenya, Senegal and other countries. Moreover, it has been argued that some emerging innovation-hubs in Africa are moving away from the traditional science-park model into third generation hubs, with less emphasis on capital-intensive state-of-the-art infrastructure and more emphasis on ‘co-creation’ (Commins and Kraemer-Mbula, 2014).

Figure 18: Map of Tech-hubs across Africa



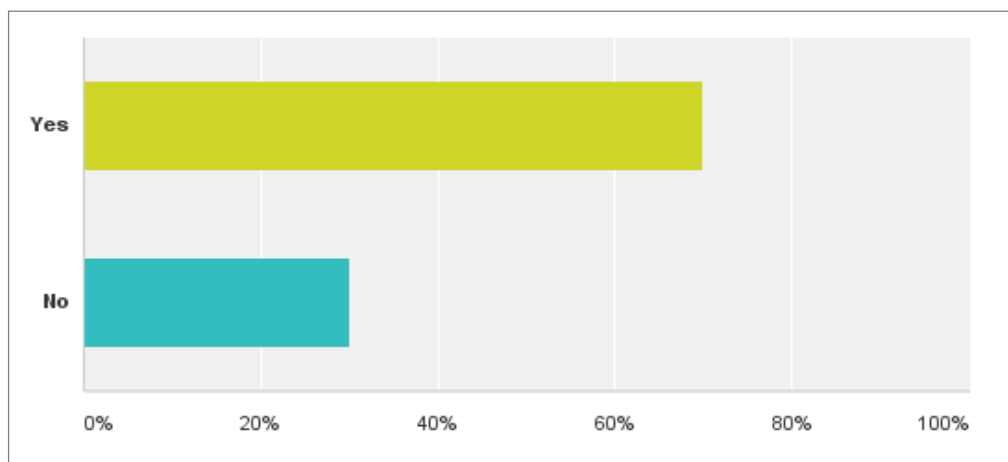
Source: iHub Research, World Bank, Bongohive (2014)

## 9. Participation in GlobeLics

The majority of respondents were familiar with GlobeLics, since about 70% had participated in some GlobeLics activity in the past, conferences, workshops or academies.

Figure 19: Have you ever participated in GlobeLics events in the past?





Source: survey Part II, respondents n=86

Out of those that responded positively, the majority (71%) had participated in GlobeLics conferences, again a reflection of the sample for this study. Over one third of the respondents had attended an AfricaLics Academy (either in Kenya 2012 or Algiers 2013). It is interesting to note that participants to the AfricaLics Academies in Kenya and Algiers were mostly new members to the network, since three quarters of those that reported to have participated in them had not attended any other GlobeLics/Africalcis event before. It must be noted that the online survey received a smaller response from Francophone countries scholars given that it was distributed in English, possibly preventing many of the participants in Algiers Academy from responding.

Table 6: Participation in GlobeLics/AfricaLics events

Type of event	Percentage of respondents
GlobeLics conferences	71%
AfricaLics workshops	13%
GlobeLics International Academy	24%
AfricaLics Academy	35%

Source: survey Part II, respondents n=86

About 70% of the respondents also reported to have participated in international events related to innovation and development in the past 5 years (excluding GlobeLics related events). It is important to note that most of those events were specialised workshops rather than regular conferences. This again, points out the need for specialised forums for African innovation scholars to interact and exchange views and ideas within the continent. Nevertheless, some of the regular conferences mentioned by the respondents in and out of Africa are captured in the table below.

Table 7: Regular conference events related to innovation and development

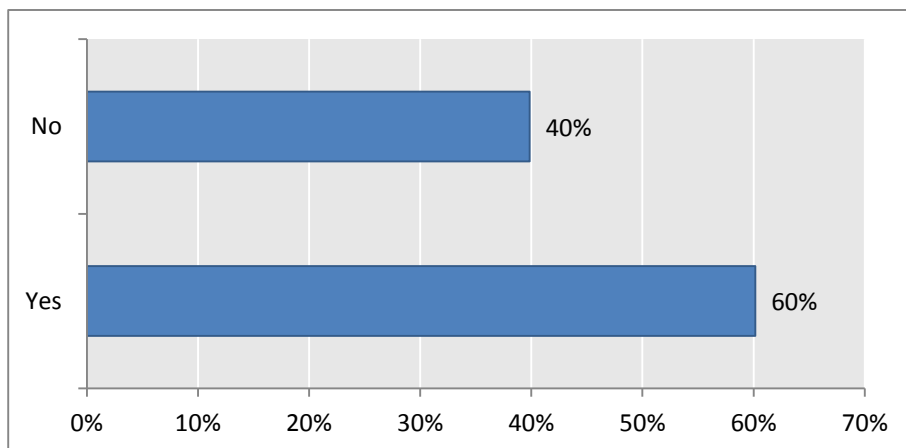
Events in Africa	International events out of Africa
African Science, technology and Innovation Indicators (ASTII) Conferences	Conference on Micro Evidence on Innovation in Developing Economies (MEIDE) – UNU/MERIT
The Southern African Research and Innovation Management Association (SARIMA) Annual conferences	The Biennial Atlanta Conference on Science and Innovation Policy
African Innovation Summit (Cape Verde)	Technology & Management for Development Centre (TAMD) at the Oxford University, UK
Conferences organised by UN Economic Commission for Africa (UNECA) and the African Union Commission (AUC) - Science with Africa Conference	PREM Network World Bank conferences
International Conference on Appropriate Technology	RMUTP International Conference on Science, Technology and Innovation for Sustainable Development
Global Congress on IP and the Public Interest & Open A.I.R. Conference on Innovation and IP in Africa	International Conference on Management of Technology, organized by the International Association for Management of Technology (IAMOT)
Annual West African Research and Innovation Management Association (WARIMA) conference	Triple Helix International Conferences, organized by the International Institute of Triple Helix (IITH)
African Network for Drugs and Diagnostics Innovation (ANDI) conferences	EU-SPRI conferences
	Portland International Conference on Management of Engineering & Technology (PICMET)
	International Society for Professional Innovation Management (ISPIM) conferences
	International Conferences on Research Infrastructures (ICRI)
	Promoting African-European Partnerships (PAERIP) conferences
	Annual Global Conference on Entrepreneurship & Technology Innovation (AGCETI)

## IV. THE RESEARCH LANDSCAPE IN AFRICA

### 10. Teaching and supervision

This section summarises the data obtained in terms of teaching and supervision activities. 60% of the respondents reported to be directly involved in teaching or training activities in the field of innovation and development – mainly involved in teaching Masters Programmes and courses for policy makers.

Figure 20: Do you teach or provide any training in the field of innovation and development?



Source: survey Part I, respondents n=129

The study also collected information about the types of training in which the respondents were engaged. Details about the courses are available in the database.

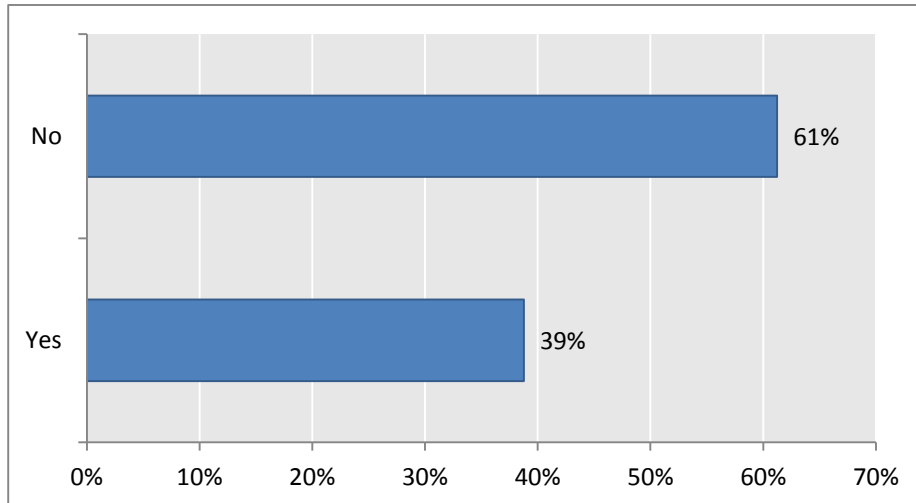
Table 8: Type of teaching/training provided

Answer Choices	Number of responses	Percentage
Undergraduate programme	26	18%
Masters programme	37	25%
PhD	12	8%
Training for policy makers	35	24%
Training for enterprises	23	16%
Training for civil society	13	9%

Source: survey Part I, respondents n=129

About 40% of the respondents reported to be involved in supervision either at the Master or PhD level, with an average amount of 8.9 Master students per supervisor, and 1.4 doctoral students per supervisor. 80% of the supervisors had achieved a PhD, and 20% of the scholars providing supervision, had a Master as their highest degree. In these cases they provided supervision only to Master students.

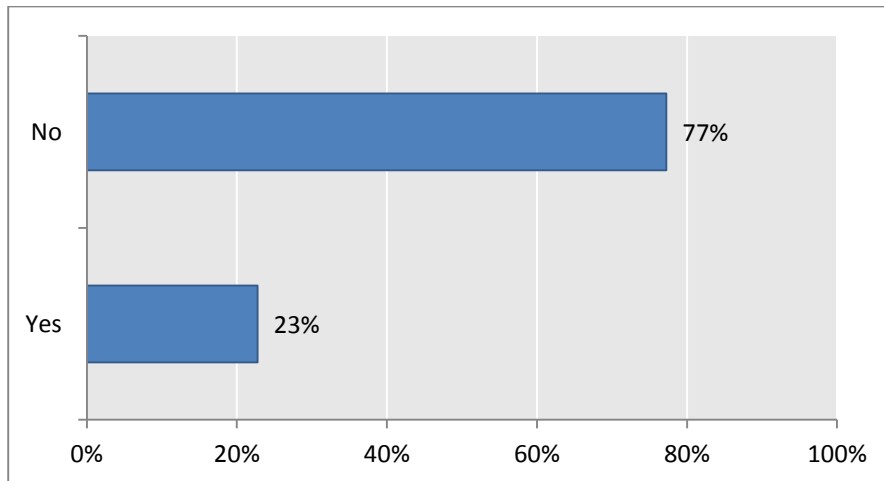
Figure 21: Do you provide supervision at Masters or PhD level?



Source: survey Part I, respondents n=129

It is worth noting that the majority of supervisors had received no formal training on how to conduct supervision. Figure 12 below indicates that only 23% had received some form of training for supervision, although it was usually not in the form of 'formal' or structured training.

Figure 22: Have you received any training on how to conduct supervision at Master or Ph.D. level?



Source: survey Part I, respondents n=129

In the majority of cases training on supervision has taken place informally 'on the job' through mentorship by other supervisors. A few structured cases of training mentioned included:

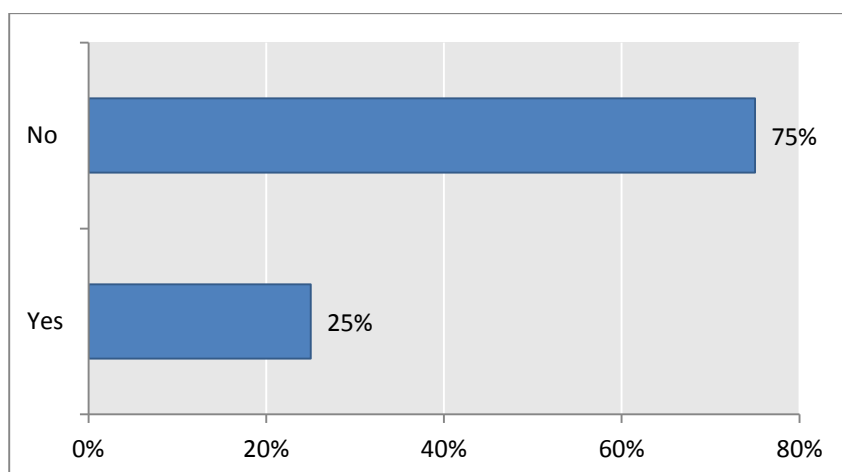
- a) the *UNESCO Innovation Systems Leadership Training of Trainers* Course provided at the Nelson Mandela African Institute of Science and Technology (NM-AIST) in Tanzania in 2012

- b) *African Women in Agricultural Research and Development (AWARD)* courses on: Women’s Leadership and Management Course; Proposal Writing and Grant Management & Oral Communication; Enhancing Negotiation Skills for Women
- c) *Development Research Uptake in Sub-Saharan Africa (DRUSSA)* short courses on: Science Utilization and Impact and Science Communication; Research Evaluation and Research Impact Assessment.
- d) *Gordon Institute of Business Science (GIBS)*, South Africa, offers a course on supervision for supervisors.
- e) *Open University (UK)* organises peer-led sessions to build supervisor capacity on a monthly basis.

## 11. Research activities

This section summarises the results related to research activities, as reported through the survey. Only 25% of respondents held research grants at the time of the survey, indicating that African scholars in the field of innovation and development are more intensively dedicated to teaching than to research.

Figure 23: Do you currently hold any research grants?



Source: survey Part I, respondents n=129

The themes that attract most interest by African researchers relate to (1) agro-industrial innovation systems, (2) aspects related to informality & competence building, (3) role of financial institutions, amongst others – see table 4 below. In fact, we found significant interest expressed in a range of thematic areas. The survey also collected details on specific active research projects in each of the thematic areas, including name of the project, aim of the project and web-link.

Table 9: Thematic areas of research activity

Answer Choices	Percentage	Number of responses
• Agro-industrial innovation systems and food security	31%	34
• Work organization and competence building in formal and informal sector	27%	29
• The role of financial institutions in relation to innovation and development in Africa	20%	22
• The role of women in Africa’s innovation systems	18%	20
• National strategies to stimulate spill-overs from BRIC-presence in Africa	15%	16
• Engineering & design capacity building and economic development in Africa	15%	16
• Building Low-carbon Energy Innovation Systems	14%	15
• Overcoming raw material curse through new manufacturing and service activities	10%	11
• Other research areas related to innovation and development (please specify)	53%	58
<b>Total Respondents: 109</b>		

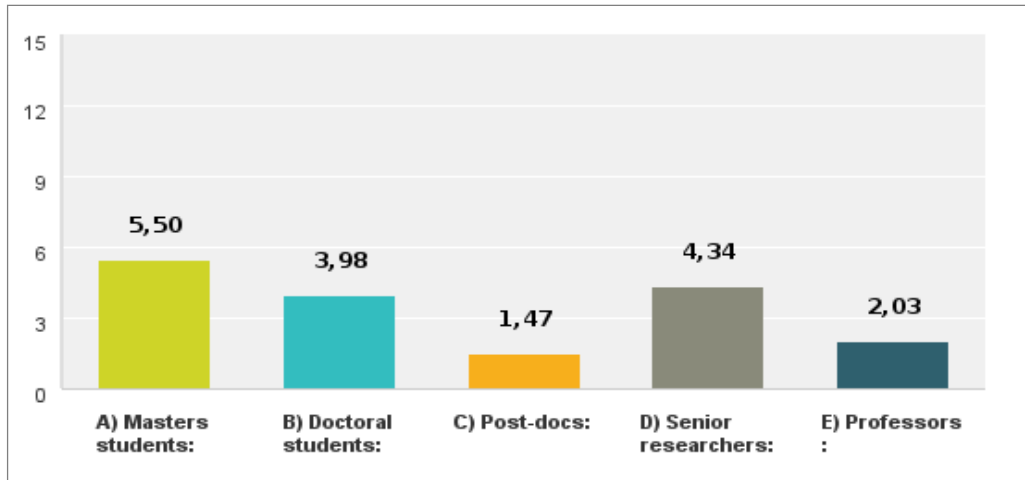
Source: survey Part I; respondents n=129

Other mentioned areas of research related to innovation and development include:

- **Industrialization** and innovation: MNCs, SMMEs, entrepreneurship, clusters, value chains
- **Technology transfer**, technological capabilities
- **Skills development**, Human capital formation, skills mobility: training, education, tertiary education, the Diaspora
- **Linkages and collaboration** across the system – university-community engagement , university-industry links, triple helix
- **Philosophy** of science and technology
- **ST&I governance**: ST&I policy and regulatory issues
- Innovation **infrastructure** and ICTs
- **Geography of innovation**: regional and local innovation systems
- Innovation in **Health**
- **Measurements and indicators** for ST&I in Africa
- **Traditional/indigenous knowledge** and innovation in culture and heritage, African knowledge systems
- **Social networks** and diffusion of innovation
- **Eco-innovation**, environmental sustainability and adaptation to climate change
- **Social impacts** of innovation

According to the respondents, Master students are predominantly the most active researchers in their institutions – since on average there were reported to be 5.5 Master students as active researchers per institution. This is followed by Senior Lecturers (4.3 average) and Doctoral Students (3.9 average).

Figure 24: How many members of staff are currently doing research in the field of innovation and development at your organization (workplace / institution affiliation)?



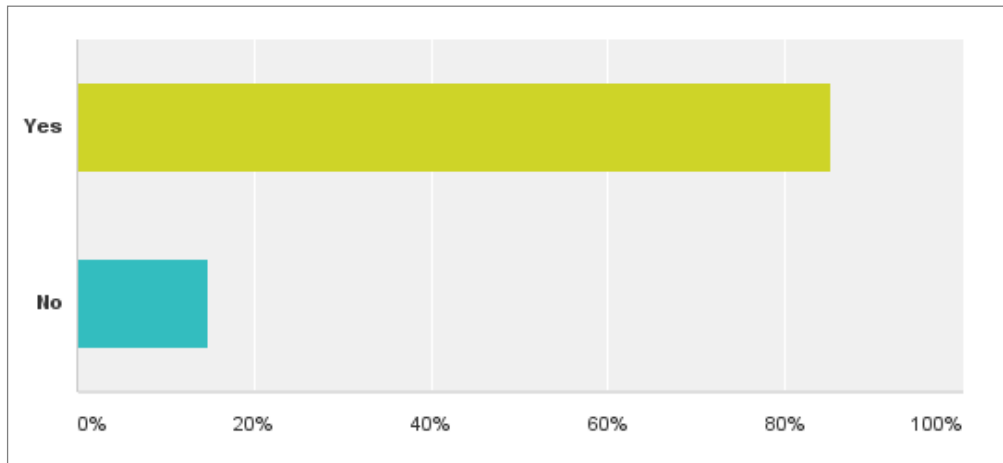
Source: survey Part I, respondents n=129

## 12. Interactions and collaborations

Interactions and collaborations appear to be very frequent. 85% of the respondents reported to have interacted with research organisations located in Africa. The nature of the interactions is varied:

- Research collaboration or research partnerships
- Consultancy/advisory collaboration
- Formulation of STI policy/strategy
- Research chairs
- Board membership
- Supervision and co-supervision
- Collaborative MSc and PhD
- Visiting fellowship/ visiting scholar, part-time lecturing
- Training: technical training and ST&I policy training
- Preparation of joint papers and joint research bids
- Participation in Conferences, workshops and seminar series

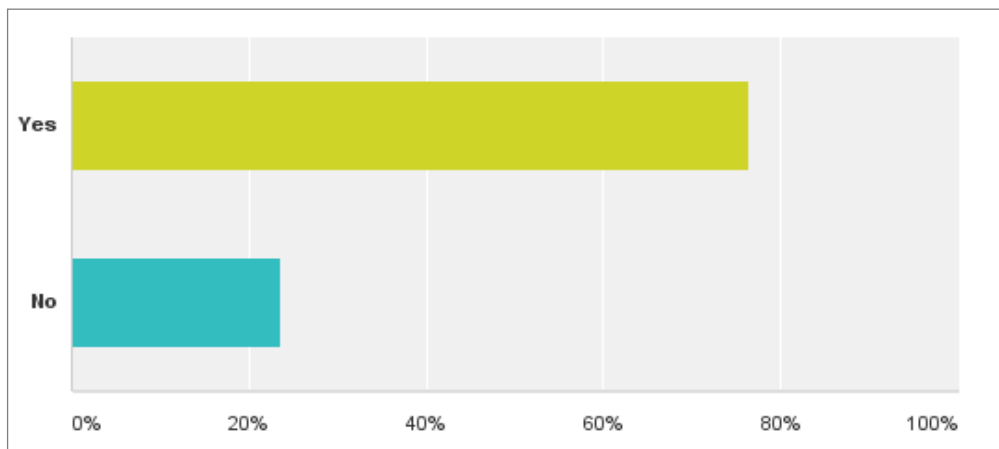
Figure 25: Have you interacted with African-based institutions in the last 5 years?



Source: survey Part II, respondents n=86

About three quarter of respondents indicated that they had interacted with research organisations outside of Africa. In this case, interactions appear to be more frequently related to the attendance of workshops, conferences and training type of interactions, than research collaborations.

Figure 26: Have you interacted with research organisations outside of Africa in the last 5 years?



Source: survey Part II, respondents n=86

## V. CONCLUSIONS

Africa is the youngest continent in the planet with more than two thirds of its 1.1 billion population below thirty years of age. Whilst such demographic profile poses manifold challenges in terms of food



production, healthcare provision, skills development, urbanisation, employment and so forth; it also represents a great potential in shaping the future of research, in this case in the field of innovation and development. The results of this study reflect the existence of a young, emerging community of African scholars and practitioners that identify themselves with innovation and development. This community is active in teaching activities, supervision and publications, although locally-based research remains relatively weak. The pool of trained scholars and experts in innovation appears to be growing. However, the community is still relatively scarce in view of an increasing demand for capabilities in the field of innovation, driven largely by the numerous programmes, strategies and policies in most African countries. Such scarcity manifests in multiple roles and multiple levels of responsibilities that are acquired by the limited pool of qualified researchers in the field of innovation and development. The commitment of African scholars to training the next generation of innovation scholars and researchers is manifest in the strong ties created through supervision. However, the small number of experts in the field and the limited exposure to supervision training (amongst other factors) seem to affect the access and quality of supervision in the continent.

In terms of the content of publications and expressed research areas of interest, the results indicate that the emerging community of African innovation scholars and researchers have specific concern for topics that directly relate to African challenges, such as natural resources, human development, informality, gender issues, etc. Publications, however, remain reliant on publishers based outside of Africa. Very few journals exclusively targeting African research outputs appear to be included in international indexing resources. This affects the dissemination and impact of African-relevant research in the field.

The results of the study also reflect the severely uneven distribution of research capacity on innovation and development across Africa, with a few countries concentrating most teaching and research capacity in the field – such as Nigeria, South Africa and Kenya. Again it is important to note that these results are biased by the sample's coverage, with lesser participation from Francophone countries. Nevertheless other reports analysing publications in Africa and institutional developments (such as tech-hubs and think tanks) also point out the concentration of innovation activity in a few leading countries.

Gender imbalances continue to shape the profile of the research community in the field of innovation and development, suggesting the need to ensure that women are adequately represented and engaged in training activities, especially at the PhD level.

The field of innovation seems to be growing in Africa. In this respect a large proportion of scholars participating in the survey indicated that the organisation to which they were affiliated offered some type of training and teaching programme on innovation and development. However, teaching and training on innovation remain as a component in training programmes of other disciplines (such as management, economics, etc). Few organisations provide postgraduate training exclusively in the field of innovation and technology management, at the level of Masters, Mphil's and PhDs. Moreover, such programmes are concentrated in very few countries, mainly in South Africa. As a result scholars that identify themselves with the field of innovation and development operate independently or in small groups often in the margins of academic departments in diverse disciplines from economics, business management, sociology, health sciences, and engineering. So far the community of African innovation scholars and researchers appear to be rather dispersed, without a leading training and

research organisation that serves as a 'model' for the establishment of other centres across the continent.<sup>7</sup> Such dispersion highlights the need for Africa-based platforms to facilitate interactions and exchanges such as conferences, networks, journals and professional associations.

## **VI. ANNEX I**

### **Top Science and Technology and Best New Think Tanks (according to the 2013 Global Go To Think Tank Index Report)**

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<sup>7</sup> Similar to the 'SPRU effect' as described in Fagerberg and Verspagen (2009)

### Top Science and Technology Think Tanks

1. Max Planck Institute (Germany)
2. MIT Science, Technology, and Society Program (STS) (United States)
3. Information and Technology and Innovation Foundation (ITIF) (United States)
4. RAND Corporation (United States)
5. Center for Development Research (ZEF) (Germany )
6. Battelle Memorial Institute (United States)
7. Technology, Entertainment, Design (TED) (United States)
8. Institute for Future Technology (IFTECH) (Japan)
9. Information and Communication Technologies for Development (ICT4D) (United Kingdom)
10. Science and Technology Policy Research (SPRU) (United Kingdom)
11. Institute for Basic Research (IBR) (United States)
12. Consortium for Science, Policy, and Outcomes (CSPO) (United States)
13. Council for Scientific and Industrial Research (CSIR) (South Africa)
14. African Technology Policy Studies Network (ATPS) (Kenya)
15. International Institute for Applied Systems Analysis (IIASA) (Austria)
16. Energy and Resources Institute (India)
17. The Energy and Resources Institute (TERI) (India)
18. Bertelsmann Foundation (Germany)
19. Fondation Telecom (France)
20. Edge Foundation (United States)
21. Research ICT Africa (RIA) (South Africa)
22. Santa Fe Institute (SFI) (United States)
23. Institute for Science and International Security (ISIS) (United States)
24. African Center for Technology Studies (ACTS) (Kenya)
25. Samuel Neaman Institute for Advanced Studies in Science and Technology (Israel)
26. Telecom Center of Excellence (TCOE) (India)
27. Eudoxa (Sweden)
28. Fundación de la Innovación Bankinter (Spain)
29. Keck Institute for Space Studies (KISS) (United States)
30. Kansai Institute of Informational Systems and Industrial Renovation (KIIS) (Japan)
31. Technology Policy Institute (TPI) (United States)
32. Urban Institute (United States)
33. Science and Technology Policy Institute (STEPI) (Republic of Korea)
34. National Bureau of Economic Research (NBER) (United States)
35. National Institute of Advanced Industrial Science and Technology (AIST) (Japan)
36. Stockholm International Peace Research Institute (SIPRI) (Sweden)
37. World Security Institute (WSI) (United States)
38. Unirule Institute of Economics (China)
39. Lisbon Council for Economic Competitiveness (Belgium)
40. Japan Institute of International Affairs (JIJA) (Japan)
41. Peterson Institute for International Economics (United States)
42. North South Institute (Canada)
43. Institute for the Encouragement of Scientific Research and Innovation of Brussels (ISRIB) (Belgium)
44. Lowy Institute (Australia)

45. Moscow State Institute of International Relations (MGIMO), (Russia)
46. Turkish Economic and Social Studies Foundation (TSEV) (Turkey)
47. Evidence-Informed Policy Network (EVIPNet) World Health Organization (Switzerland)
48. Singapore Institute of International Affairs (SIIA) (Singapore)
49. Tanzania Commission for Science and Technology (COSTECH) (Tanzania)
50. New America Foundation (United States)

**Best New Think Tank**

1. Instituto PVBLICA (Brazil)
2. Russian Council on International Affairs (RSMD) (Russia)
3. Centre Africain des Etudes Asiatiques (CAEA) (Morocco)
4. Center for Research and Opinion Polls (CROP) (Togo)
5. Eupolis Lombardia (Italy)
6. Fundación Libertad y Progreso (Argentina)
7. Riley Center for Livable Communities (United States)
8. Regional Center for Strategic Studies in Cairo (RCSS) (Egypt)
9. Pueblos por Malvinas (Peoples for Malvinas) (Argentina)
10. MISTRA: The Mapungubwe Institute for Strategic Reflection (South Africa)