Proceedings of the Expert Meeting: Implementing Research and Innovation Policy at Policy and Institutional Levels in Africa

Abiye Daniel
Programme on Innovation, Higher Education and Research for Development

IHERD

Organised in partnerships with the Organization for Social Science Research in Eastern and Southern Africa (OSSREA)

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<td>BRICS</td>
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<td>CAR</td>
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<td>CODESRIA</td>
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<td>ECOWAS</td>
<td>Economic Community of West African States</td>
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<td>GDP</td>
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<td>GERD</td>
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A Brief about the Meeting, the Participants and Organisation of the Report

Paulos Chanie and Åsa Olsson

Rationale and Objectives

Many African countries have put in place research and innovation policies and strategies for integrating higher education and research into macroeconomic policies. In addition to this national focus, the African Union is increasingly involved in stimulating development of research and innovation capacities through supporting various initiatives including the Pan-African University.

The governance of public research and innovation is a difficult task because, while research financing remains for the most part national, research is being conducted within increasingly transnational and global networks. This trend is important for African stakeholders to engage in since it concerns research in key areas relevant for development such as climate change, urbanisation, water, energy, health and food security.

Research universities are central to building national capacity for research, innovation and advanced education. Depending on their quality and resources, they are part of the global knowledge economy. Top research universities in industrialised countries (often referred to as the Super Research Universities) usually dominate the global ranking tables. In contrast, their counterparts in middle and low-income countries are striving to reach that stage and are serving as engines of local knowledge development and natural leaders of their own evolving academic systems. As these systems become increasingly complex and the need to nurture knowledge networks for research grows ever more essential, the success of these institutions becomes even more crucial for national development policy.

During the past 20 years, the general trend has been to combine research and innovation within the same policy package. Research and innovation policy now differs radically from previous generations of science and technology policies in three key respects that resonate well with the needs of African countries; it:

1. emphasises the need for universities and other public research providers to pursue research agendas that are anchored in the needs of the society which they inhabit,
2. promotes public-private partnerships as a key mechanism for achieving linkages between the economy and higher education and research, and
3. it embraces a systems perspective.

In the context of many African countries, building research capacity necessitates a primary focus on acquiring the critical mass of Science and Technology personnel necessary to meet the most immediate local needs such as the training of students, conducting research, etc. While too heavy reliance on donors is a risky strategy, it is clear that donors play an important role in Africa, particularly during times of weakened economies and lingering recovery.

Against the background of the changing global landscape in higher education and research, it is important for African countries to apply strategies that enable them to get access to global networks while meeting local needs.

This expert meeting brought together 35 participants from Africa, Asia, and OECD countries to reflect on the changing higher education and research landscape and its implications on research and innovation policy, leadership and implementation in the context of Africa.

The specific objectives of the meeting were to:

- identify professional, capacity and policy gaps to address effective research and innovation management at policy and institutional levels, and
- identify strategic options that can address the identified gaps.
The discussions of this meeting were guided by conceptual reports and case studies that have been commissioned as a part of the OECD/IHERD project.

The Participants

The participants, as can be inferred from Annexes I and II, were:
- targeted experts;
- policy-makers and policy-shapers of research and innovation policies;
- academics in the fields of innovation, higher education and research for development; and
- research leaders and managers from:
  - higher education institutions,
  - public research organisations, and
  - research funding development assistance agencies supporting higher education, research and innovation in Africa.

The organisations from which the participants were drawn include:
- African Academy of Sciences
- Association of African Universities
- The African Observatory of Science, Technology and Innovation (AOSTI);
- Science Technology and Innovation Programmes (STI) and Pan African University (PAU), The African Union (AU),
- African Union Commission (AUC)
- Institute for Research and Development (IRD)
- Educational Research Department, Centre for Advanced Research
- African Network for Internationalisation of Education (ANIE), Kenya,
- Centre for Studies in Science Policy, Jawharlal Nehru University, New Delhi
- Council for the Development of Social Science Research in Africa (CODESRIA)
- Organisation for Social Science Research in Eastern and Southern Africa (OSSREA)
- Research Cooperation Unit, Swedish International Development Cooperation Agency (Sida)
- University of KwaZulu-Natal (South Africa); Makerere University (Uganda); Harvard University.

Organisation of the Report

This report discusses the proceedings and outputs of the two day expert meeting on Implementing Research and Innovation Policy at Policy and Institutional Levels in Africa. Capturing key points in the welcome addresses, it leads to summaries of the presentations, key commentaries by lead commentators, and discussions under each of the five sub-themes:

- Session I: Trends in research and innovation policy and implications for Africa
- Session II: Research funding instruments and modalities
- Session III: Leadership and management of research at the institutional level
- Session IV: African Union initiatives
- Session V: Challenges and opportunities for African universities to increase knowledge production.

The Report winds up by presenting key lessons for policy and practice, as reflected in the concluding session, Session VI, by four panellists and the moderator based on what transpired from the one and half-day meeting. In general, the Meeting proceeded according to the pre-set agenda (see Annex III), thus the organisation of the report follows that order.
Welcome Addresses
Paulos Chanie, Director of Research and Capacity Building at OSSREA, chaired the opening session, where Åsa Olsson, IHERD Project Manager at OECD/IHERD, Paschal Mihyo, Executive Director of OSSREA and Lena Johansson de Château, Research Advisor, Research Cooperation Unit, Department for Global Cooperation, Swedish International Development Cooperation Agency (SIDA), Sweden welcomed all the participants and made remarks as indicated below.

Åsa Olsson
In her welcome remarks, Åsa Olsson indicated that IHERD has a pre-history in the UNESCO Forum on Higher Education and Research and Knowledge. She also noted that the idea behind IHERD is to deepen analysis and discuss this with concerned stakeholders. This has been done by involving a global network of scholars, practitioners, and experts in the field of higher education, research and innovation policy. She indicated that the OECD has, over the years, commissioned a number of studies to capture further emerging issues and questions in the areas important for connecting higher education, innovation and research policy. In addition to that, it initiates and facilitates dialogue with scholars and stakeholders involved in implementing these policies. She also indicated that the IHERD Programme has 3 months remaining during which they will disseminate the results to stimulate debates and action in linking research and policy, and dissemination of research results.

Paschal Mihyo
On behalf of OSSREA and himself, he extended a warm welcome to all of the participants whom he also thanked for accepting the invitations to come to the event to share the experiences and views they have accumulated over the years about research and innovation. He also expressed special thanks to OSSREA's partner research organisation OECD/IHERD for co-organising the event with OSSREA on this critically important area, and to Sida for financing the meeting and supporting higher education, research and innovation programs in the region and over the continent for many years. This, according to him, is enabling Africa to not only conduct research but also building research capacity such as the creation of many leaders of research in the region while also sharing experiences. Creating such fora for discussing research-policy linkages focusing on Africa and Africa’s research is an important and appreciable initiative. Furthermore, Professor Mihyo recognised that the roles of regional organisations in trying to change governance and development initiatives and shape the destiny of the continent have been tremendous and decisive.

Mr. Mihyo suggested that the participants should discuss and reflect on how to bridge research and policy gaps in Africa, innovation and innovation policy, and capacity problems; to analytically look at recent strengths and achievements, how to enhance them, and how to use outputs of research already undertaken to take the continent out of poverty.

He stressed that the meeting should focus on magnifying the vitality of research and innovation policies as these must help end the further marginalisation of the social sciences in higher education and research due to the unfounded biases towards the natural sciences, which projects natural sciences as the only disciplines relevant to science and technology. He implored the participants to also discuss ways to renew and act on innovative strategies of research and research uptake that can help enhance Africa’s research capacities to do research that effectively informs development policies and helps to transform economies of the continent. Mr. Mihyo further urged the participants to look for better ways of working through and with policy makers in the processes of designing and conducting research and disseminating outputs, ways of strengthening research uptake, and enhancing researcher accountability.

Lena Johansson de Château welcomed the participants and made the following remarks:

- This meeting brings together experts, researchers, policy makers and development professionals from higher education and research organisations and institutions in Africa. We
are here to take part in and discuss and together bring forward the results of the IHERD programme.

• Close cooperation with our partners is fundamental to the implementation of Sweden’s policy for research cooperation. Further, cooperation between our partners is strongly encouraged, in order to join forces, avoid overlap and work efficiently towards common goals.

• Sida has supported the OECD programme on Innovation, Higher Education and Research for Development (IHERD) since 2011. As mentioned by Åsa Olsson, the aim of IHERD is to increase and coordinate strategic investments in research, higher education and innovation on a global level. IHERD focuses on: 1) research and innovation policies, and 2) institutional management and higher education policies. The studies we will discuss have been produced in the IHERD programme.

• Sweden, and Sida, has a holistic approach to research support, believing that developing countries’ ability to design and implement research and innovation policy is critical for social and economic sustainable development. With this holistic approach, we are convinced that the contribution and integration of all fields of research, including humanities and social sciences, is necessary in order to bring about sustainable change. We also believe that we need to work systematically towards bridging the research-policy gap and promote transparency. Through our research cooperation, Sida is committed to building capacity in developing countries and, together with our partners, helping with relevant and timely information needed to deal with complex and uncertain global problems. Traditionally, research has not been a priority in development assistance. Sida has attempted to change this perception by providing evidence on the importance of investing in research capacity in developing countries. One way to achieve this is to support research on research and higher education policy, such as in the IHERD programme.

• Against this background, the urgency of the issues dealt with in the IHERD programme, cannot be overemphasised. This is so because the world is facing a number of fundamental changes such as the ramifications of globalisation of research and higher education for developing countries, which both provides opportunities and challenges to developing countries. Some of the fundamental changes, which also form the point of departure for the IHERD programme, and this meeting are:
  o Dramatic expansion of the higher education sector in Africa and elsewhere (state-owned and private institutions, enrolment of an increasing number of students.)
  o Increased expectations from governments on the academy to commercialise research results and to deliver research of relevance for the society. The linkage needed university-industry/private sector/ fight unemployment, create jobs.
  o Further, although most research funding remains national, there are potential opportunities arising from the creation of transnational funding instruments. The best design and implementation of regional research cooperation also needs to be discussed.

With these welcome addresses by the organisers, the facilitator of this particular session Dr. Paulos Chanie convened Session I.
SESSION I: Trends in Research and Innovation Policy and Implications for Africa

The presentations and discussion under this session were aimed at finding answers to the following questions:

• What are the main advantages and challenges with the current research and innovation policies in Africa at the national level?
• What are the options for addressing the defragmentation and imbalance of the governance structure of research and innovation, including improved coordination between governmental agencies providing support for research and innovation?
• What can be done to increase the commitment and understanding amongst policymakers about the critical linkages between national development and research and innovation?


Presenters: Åsa Olsson and Natalie Cooke.

Lead Commentator: Eli Katunguka, Director of Research, Makerere University, Uganda.

Presentation 1

Findings of the IHERD Report on the Evolving Path for Strengthening Research and Innovation Policy for Development

Ms. Åsa Olsson, IHERD Project Manager, and Ms. Natalie Cooke, Consultant, Country Study and Outlook Division, OECD Directorate of Science, Technology and Industry

This presentation covered:
• importance of higher education and research for development,
• types of funding mechanisms that are applied in developing countries,
• key policy imperatives for building research universities in developing countries,
• current role that development assistance plays in addressing capacity-building needs for designing and implementing R&I policy, and
• conclusions and strategic options for developing countries and donors.

Concerning the relationship between higher education, research and development, it was noted that the sustainable, long-term beneficial contribution of knowledge to development is indirect, not immediate; and thus, longer-term knowledge-generative capacity is important for educating skilled labour that can address challenges and opportunities. While the university remains the best and only producer of self-renewing knowledge producing capacity, African universities in general are not strengthening self-generative capacity; nor are they making a substantial contribution to new knowledge production. However, despite this limitation, many governments and development assistance actors don’t see enhancing the universities’ capacity to produce knowledge-generative capacity as a priority.

Potential areas for improvement in research and innovation policy in developing countries include qualitative aspects related to the governance of research and development that may lead to improving the performance of developing countries, such as:
• strengthening linkages between policy formulations and ambitions expressed in strategic documents;
• addressing the defragmentation and imbalance of the governance structure of research and innovation; and
• strengthening the knowledge and skills of policy makers.

Policy trends and funding mechanisms in developing countries to support research have been competitive vs. non-competitive, giving priority to centres of excellence, and taking into account some meta instruments. These days, funding policies tend towards meta instruments, competitive funding, and cooperation with research councils.

Vitalising leadership and management of public research institutions in developing countries was seen as indispensable, where the link between priority setting and implementation is lacking in many universities and ministries, contributing to the poor landscapes on which research findings and innovation can be implemented. In the face of this, areas requiring attention include: leadership’s awareness of research and innovation settings, institutional governance of research and innovation, establishing a research culture and ethos, research infrastructure, research management and administration, as well as enhancing leadership awareness of the importance of linking research and innovation policy take-up. While according adequate attention to these areas is imperative, research does not often figure as one specific sector in development assistance; a reality which is conditioned by methodological problems in measuring the volume of assistance for research, as well as the fact that assistance is affected by framework conditions in place— level 1 conditions: legal and structural issues, and level 2 conditions: operational aspects. To list some, those conditions include funding objectives, research innovation policies, funding mechanisms and programs, and technical assistance and country views. Development assistance for research and innovation policy is thus what we should advocate for.

Research funding trends generally tend to match the following objectives;
• supporting countries’ ability to design and implement research and innovation policy;
• supporting them to do research for addressing specific socio-economic objectives;
• providing aid for basic research relevant for development; or
• commissioning research to inform development assistance policies and programmes.

Aiming to achieve such objectives, funding and evaluation mechanisms consider:
• importance of co-location of research tasks and diversity in the types of research organisations;
• centralised vs. decentralised development agencies;
• relevance vs. excellence, concepts which may not go together always as what is relevant for Africa’s context may not have the excellence funders might want to see;
• peer review as an effective mechanism of maintaining scientific quality and;
• results-based management of research and innovation.

As shown in the study on Swedish assistance to research there are a number of challenges facing development assistance agencies. These include the ownership agenda, that is, most developing countries do not own research and innovation funding and thus policy mismatches between expectations of donors and actual innovations by recipients occur. Furthermore, capacity for priority setting and analysis, knowledge of funding instruments and modalities and the links between them are also missing.

The presenters concluded with the following remarks:
• It is important that low-income countries take ownership of capacity building efforts seriously;
• Too heavy reliance on development assistance is risky as support is dependent on donor country political priorities, which can be out of line with individual country priorities;
• Most countries have policies and strategies on innovation, higher education and research as an integrated part in economic development planning; however, there is a gap between policy intentions and the actual capacity to implement them.
The presentation was concluded with suggestions for future action:

- Policy-makers need to be better informed of the importance of making a stronger commitment to research and innovation, research trends, policy setting and funding arrangements affecting research and innovation management.
- Policy-makers need to be assisted to develop skills in creating research and innovation policies that are evidence-based and informed by strategic considerations.
- Research funding organisations including COEs, should consider applying a mix of funding instruments and modalities, and trans-national funding.
- Policy-makers need to develop an appreciation of training needs of researchers and the importance of institutional autonomy to universities.
- Research managers and administrators within universities and research institutes need more support with the development of knowledge and skills related to their responsibilities.

Presentation 2

The African Observatory of Science, Technology and Innovation (AOSTI)

Philippe Mawoko, Director of AOSTI and Bi Irié Vroh, Science and Technology Policy, Human Resource Science and Technology, African Union Commission

This presentation started by setting the context and background, and proceeded to discussing the African Union STI Framework, what an STI observatory is, and the African Observatory of STI (AOSTI).

Context and Background

Many countries in Africa have the weakest research infrastructure, lack research capabilities, and experience continued brain drain, which aggravates the lack of critical mass in most scientific disciplines. In terms of recurrence of research themes, land and primary resources’ sciences (i.e. agriculture, ecology, geosciences and plant and animal sciences) constitute 26% of the research in Africa, which is a much higher proportion compared to the 13.5% in the USA and 19.5% in India (Scientometrics, 79: 297–309). The Gross Expenditure on Research and Development (GERD) intensity of 1% GDP has not yet been reached by the vast majority of African countries (African Innovation Outlook 2010). In terms of research impact on policy and practice, Information and Communication Technologies (ICT) AU research impact (63%) and concentration of research efforts (79%) are below the world average (AOSTI, 2013). Likewise, Africa’s inventive profile, as indicated by patents, is far below the world’s average.

The importance of measuring and evaluating STI research is audaciously alluded to by, ‘you can’t manage what you don’t measure’. In this regard, the development and implementation of STI programmes involve multitude of actors, multitude of interactions, and complex decision-making processes which render the measurement and management of STI difficult. Cognisant of this, efficient management of such decisions and the processes that lead to them requires quantitative and qualitative information on available resources, results attained, and trends and future scenarios. Convinced of the role STI plays in development, the AU Summits Decisions have called for:

- the use of STI to boost socioeconomic development;
- evidence-based policy making for Africa’s development; and
- institutionalisation of the measurement of STI activities.

The African Union STI Framework

It has been noted that Africa’s Consolidated Plan of Action (CPA) 2005–2012 addresses the use of S&T as a catalyst for development; encompasses the African Union’s STI programmes and related policies; aims to support the commitment of African countries to use STI; and has two

1Vroh Bi Irie, e-mail: vrohb@africa-union.org, AOSTI, Malabo, Equatorial Guinea; www.aosti.org.
STI indicators and/or policy programmes: 1) ASTII (African STI Indicators Initiative –NEPAD), and 2) AOSTI (African Observatory of STI). The New AU STI Strategy for Africa 2024 is the Pan-African Science, Technology and Innovation Strategy.

**What is a STI Observatory (STIO)?**

STIO is described as intelligence hubs (institutes or networks) for the acquisition of information on the status of STI in a country, a region or a continent. STIOs allow an entity—institution, country, region, etc. to characterise its own scientific and technological activities and to compare them with their partners or competitors; they also allow changes to be tracked over time, and are, therefore, important in informing decision-making. (For details, refer to AOSTI Working Paper #1 at www.AOSTI.org).

**The African Observatory of STI (AOSTI)**

AOSTI was established by the Decision Assembly/AU/Dec.232 (XII) of February 2009, to institutionalise the measurement of STI activities and policy analysis in Africa, and support evidence-based policy making in Africa by:

- providing African decision-makers and interested parties with relevant STI indicators and policy advice, and
- gauging STI support with reference to development goals, such as poverty alleviation, human development, etc.

Thus, AOSTI is established to be a continental repository for STI statistics, and a source of policy analysis in support of evidence-based policy making in Africa.

AOSTI has six thematic programmes of work for 2013–2017, agreed upon by the Intergovernmental Meeting held in Malabo, May 2012 (see diagram).

**SOURCE: Report of the First Intergovernmental Meeting on AOSTI, Malabo, May 2012**

The following were listed as stakeholders using the expertise of AOSTI:

- AOSTI in Togo on request of ECOWAS (3–5 September, 2012)
- AOSTI in Egypt on request of NEPAD (February 11–15, 2013)
- AOSTI in Senegal on request of UNESCO (12–14 March, 2013)
- AOSTI in Cote d’Ivoire on request of Islamic Educational, Scientific and Cultural Organization (ISESCO) (15–17 April, 2013)
- AOSTI in Niger on request of ECOWAS (4–6 June 2013)
• AOSTI and ISEESCO on training Parliamentarians (in discussion)
• AOSTI and UNESCO on training Parliamentarians (in discussion)
• Request of assistance from ECOWAS on STI indicators of the ECOWAS Policy on Science and Technology (ECOPOST) (in discussion)
• Request from Nigeria for biotechnology indicators (in discussion)
• AOSTI at the Central African Economic and Monetary Community Parliament (October 2013)

The presenter alludes to the fact that early demands from the stakeholders show a buy-in of the AOSTI project and the need for such an institution on the continent.

He also mentioned examples of AOSTI outputs:
• Summary and materials at www.AOSTI.org
• AOSTI Working Paper #2: Science, technology and innovation policy-making in Africa: An assessment of capacity needs and priorities.
• ASTII-AOSTI Policy Brief #1: Monitoring Africa's progress in research and experimental Development.
• Development of AOSTI information system (a continental STI statistics repository Feasibility study).

The presenter concluded by tipping the need to build and analyse the research and innovation system, including input-output mechanisms, along with the African Union STI framework, and by underscoring the importance of engaging parliamentarians to facilitate the formulation, implementation and institutionalisation of STI and research policies and systems.

**Comments by the Lead Commentator**

**Professor Eli Katunguka, Director of Research, Makerere University, Uganda**

“I want to thank Asa Olsson and Natalie Cooke for having put together this excellent paper for discussion. They raise very important issues on the interesting topic of strengthening research and innovation policy for development.

During this discussion I will draw on my long experience in the university setting spanning over 38 years and my experience in coordination of development research in Makerere University, one of the leading research intensive universities in Africa spanning over 15 years.

I come from Uganda, one of the low income countries with a population of 34 million, whose economy is agricultural based with a very slow pace of industrialisation. The private sector is just beginning to grow.

It is true that many African countries now realise the importance of higher education and research in contributing to national socio economic development. The policies to integrate higher education and research in macro-economic policies are all included in a number of documents such the National Development Plan and the Vision 2040 geared towards eradicating poverty and transforming low income countries into modern prosperous nations by 2030 or 2040 as the case may be.

The research system in Uganda is centralised with the National Council for Science and Technology housed in the Ministry of Finance, Planning and Economic Development. It is charged with coming up with the science and technology policy for the country. In addition there
are discipline-specific research councils like the National Agricultural Research Organisation with a number of research institutes and the Uganda National Health Research Organisation which coordinates health research in the country. Together with this arrangement comes public universities where the bulk of research is carried out especially Makerere University, the oldest public university in Uganda. Many other universities have come on board but their research competence is still low.

There is therefore a focus on leading universities and national research institutes to provide the knowledge that will inform policy and develop the country. The universities have been urged to develop research agendas that are anchored in the needs of society in which they are situated. It is therefore not surprising that most universities tend to focus on development issues like health, food security, energy, transport, provision of clean water.

In many cases the donors or development partners have supported research that is going to have an impact on poverty alleviation or improving the living conditions of people. Makerere University has been attractive to different development partners but the largest has been Sweden as part of the strategy for development assistance to Uganda. Research has been identified as one of the sectors for support alongside water and road infrastructure and the money for research goes directly to the university and does not mix with government funds.

Unlike many other development partners, Sida does not set the research agenda but defines the broad goals of the funding as poverty alleviation and improvement of people’s livelihoods. So the research design by the researchers must have this long-term impact in mind.

It is also acknowledged that the public-private partnerships are key mechanisms for achieving linkages between the economy and higher education and research. In Uganda, the private sector is rudimentary. There are not many industries that require knowledge from the university to improve their economic performance. The exception to this is the telecommunications industry which has found very fertile ground in low income countries.

Because of the underdeveloped private sector, many innovations or potential inventions are not taken to the next level. Scientists are therefore forced to go into the development of products to supplement their incomes. This dismisses research output in the form of innovations because more scientists are in the market place prematurely.

The commercialisation of research results is still limited in many low-income countries because of a very young private sector. This is despite having intellectual property management policies both in universities and research institutions. Most of the research is applied research that does not lend itself to commercialisation. Basic research also needs to be brought to a higher level.

Universities with support from development assistance are therefore charged with the responsibility to develop capacity to design and implement research policy and this is through training at PhD and postdoctoral training. Over the last fifteen years, Makerere has been developing capacity through PhD training supported by Sida, Carnegie, NORAD, USAID and Rockefeller Foundation. Currently out of 1,300 staff close to 800 have PhDs. Postdoctoral training has been introduced through competitive grants awarded to research teams working on specific topics of national importance. So far close to 30 research teams are funded.

The PhD and post doctor training are done in partnership with other universities in Sweden in the areas of health (including public health), engineering and technology, science, agriculture and veterinary science and social science and arts. This partnership has worked well so far but not without challenges. The Swedish universities also want recognition for their role in the partnership as it is important for their career progression.

The ten years of Sida funding has resulted in the creation of centres of excellence in various areas, e.g. energy, health, agriculture, and social sciences. Another call for a concept for the next phase of Sida support (2015-2020) was received to the tune of about 26 million dollars. There has been a move away from straight PhD training.
In low-income countries, basic research, especially that involving laboratories, receives less support from countries and development partners. This is because of the need for expensive science equipment which is beyond the reach of many universities. In Makerere, cross-cutting state of the art science laboratories have been created to be shared by faculty members. This is in addition to science equipment provided to support both PhD and postdoctoral training. At the same time there is a declining number of students studying science subjects in secondary schools, and thus a limited pool of scientists to draw from.

It is true that the higher education system has expanded rapidly in the past ten years. In Uganda, there are now seven public universities and thirty private universities compared to one public university fifteen years ago. Most of these private universities do not have adequate staff and they do not teach science because of the cost of infrastructure required. Makerere University therefore must train sufficient capacity to power these universities including the regional institutions in Rwanda and Southern Sudan. This does not provide enough time to do research for development.

Low-income countries must take ownership of their research policy and develop sufficient science and technology personnel. Governments must provide scholarships for PhD and postdoctoral training because dependence on development partners is not sustainable. These countries must provide adequate resources to develop higher education, research and innovation and enable them to contribute to national development.

Individual countries may not manage this on their own; hence, they may depend on regional efforts, e.g. African Union on the Pan-African University and the African Observatory of Science, Technology and Innovations.

Many countries have prepared vision documents in consultation with governments and technocrats; but those documents are difficult to implement. Uganda has a number of national research organisations and public universities; however the universities need to take into account in their research agendas what the governments want to do and achieve.

While welcoming the suggestion to engage the parliamentarians in research and STI policy processes, implementations and output uptake, he also suggested that there is a need to be careful in doing that as the parliamentarians are not technical people.

The importance of taking ownership of research and innovation policies and funding cannot be overemphasised in the context of Uganda and other countries, too. Building and sustaining internal capacity is crucial in this regard; thus, we need to work together with the AU on how to generate more capacity to train adequate numbers of African professionals and parliamentarians on how to facilitate science, technology, innovation and uptake, which require the key functions of monitoring and facilitating.

**Discussion**

**Comments**

- When you talk of engaging parliamentarians, we must not forget the importance of contextualising; policies are not in a vacuum; we also have the market forces that need to be taken into account.
- Many of the participants appreciated the AOSTI initiative and called for energising it further to support social science research and STI policies and strategies, their implementation, monitoring and evaluation in Africa.
- Looking at the global context, there has been increase in research uptake to use knowledge and human capital to address challenges to human existence - hunger, climate change, ecological stress, population growth, etc. The need for this in developing countries can’t be overstressed.
- Research and innovation has gained prime importance and this has led to IHEs and research being required to be:
more-demand oriented;
responsive to the needs of society; and
strengthen links with the real economy.

- But there has been limited understanding by policy-makers of the nature and constraints IHEs face.
- This has made managing innovation a very important area.
- Efficiency has become important to economic growth.
- Innovation in economic growth has also become crucial.
- Capacity building can be enhanced if there is an effective network and collaboration among the research organisations.

Questions
1. Why not include also the policy actors such as NGOs, and think tanks in addition to the policy makers?

Response by Presenters
- Åsa Olsson acknowledged that there is the need to contextualise; but the policy trends reveal gaps in contextualising; and so do the funding modalities.
- The comment on enhancing links between science technology and innovation and policy is a valid one; but the reality is not as it should have been.
- Mr. Mawoko appreciated the comments regarding the mission of the Observatory. In developing actual indicators for science, technology and innovation, some of our policy makers tend to stick to target-driven numbers. The comments regarding the need to engage the parliamentarians are valid.

SESSION II: Public Research Funding Instruments and Modalities

This Session focused on the following questions, which need to be answered:
- **What are the main advantages and disadvantages of different funding instruments and modalities to achieve capacity building in research and innovation?**
- **What opportunities exist for African countries to participate in "meta instruments"?**
- **What policies and management can favour the emergence and expansion of COEs in Africa?**

**Moderator:** Benjamin Buclet, Head of Capacity Building Department, Institute for Research and Development, IRD.

**Presenters:** Presenters for this session were Åsa Olsson, Venni Venkata Krishna and Krish Bharuth-Ram.

**Lead Commentator:** Ebrima Sall, Executive Director, CODESRIA

**Presentation 1**

**The Findings of the IHERD Research Report on Public Research Funding Instruments and Modalities**

Ms. Åsa Olsson, IHERD Project Manager, Division of Country Study and Outlook Division, OECD Directorate of Science, Technology and Industry

The motivations for the study were:
- Internationalisation of research policy practice.
- Increasing focus on collaboration (research and policy).
- Coordination of funding for development cooperation within European Union.
- Increased use of competitively allocated funding as opposed to direct institutional allocation.
A research funding instrument is defined as an arrangement for financing or disbursing money to research performers. Examples include block grants, projects, programmes, vouchers, grants and stipends. This means that:

- Even research poor countries will have to build capacity in how to fund and steer research if they are not to fall further behind.
- The ability to participate in international scientific networks is increasingly becoming dependent not only on having competent scientific labour but also competent research managers in science and technology departments, institutes, etc.
- Research funders are collaborating and pooling competences across borders more than before. This is an opportunity for those who are not on the frontline to acquire competence quickly and relatively cheaply through network participation.

The presenter defined research funding modalities as the means, specifications or terms of reference used to operationalise or implement a funding instrument. Examples include:

- restricted eligibility, in which proposals must include specific partners such as firms, public sector actors, international partners; and
- co-financing in which applicants must be able to finance a previously agreed percentage of the costs of the proposed research to be eligible for funding.

What is funded through these instruments are objectives, which include internationalisation, career advancement, career renewal, capacity building, strategic research, collaboration, and commercialisation of academic research. Some typical groupings or clusters of objectives are:

- Cluster I: Career advancement, career renewal, and internationalisation;
- Cluster II: Collaboration, strategic research, internationalisation, and career advancement;
- Cluster III: Capacity building (basic research), collaboration, and commercialisation.

Joint Programming is important for building capacity to cope with societal challenges. Programme, project, and stipend make up instruments of joint programming. The modality is that all applications must include collaboration with country A, B and/or C. Requirements include cross-organisational collaboration, timing of calls, review procedures, size of awards, and timeframe for awards. For more information, visit www.oecd.org/iherd.

**Presentation 2**

**Findings from the Study on Centre of Excellence as a Tool for Capacity-Building**

**Venni Venkata Krishna, Centre for Studies in Science Policy, School of Social Sciences, Jawharlal Nehru University, New Delhi**

This presentation started by defining Centres of Excellence as a funding modality for programme funding intended to support:

- Research units/organisations/university departments that strive for developing high standards and quality research, training and learning and innovation that are typically geographically concentrated (‘under one roof’) and focused on high potential for growth areas in science and industry. They may also be virtual or distributed and consist of a network of co-operative partners with a co-ordinating centre.

COEs typically have aims related to (Table 1):

- **Strategic aims**: Scientific achievement, innovation, capacity building, promoting interdisciplinary research, research concentration, global reach, and socio-economic challenges.
- **Organisational aims**: leadership development, academic management, critical mass, cooperation and networking.
• **Impacts and capacity building**: Science base and enhancing quality, internationalisation, PPPs, human capital and professionalisation, innovation/growth, international visibility and other development goals.

Table 1. Analytical Framework for COE schemes: Three inter-related components

<table>
<thead>
<tr>
<th>COE’s strategic orientation (A)</th>
<th>Institutional supporting/operational conditions (B)</th>
<th>Impacts and capacity Building A + B results in (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g.</td>
<td>• Funding and evaluation</td>
<td>• research capacities</td>
</tr>
<tr>
<td></td>
<td>• Mechanisms: governance/organisation</td>
<td>• socio-economic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• infrastructure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o training</td>
</tr>
</tbody>
</table>

Institutional support or operational conditions are constituted through funding on competitive calls and types of funding and COE which depends on the country. The selection process could have two or three stages, with timelines depending on country, e.g. 5–10 years or 15 years (South African case) or be permanent like the Indian case. Depending on the country, evaluation of implementation of the recommendations – quality, funds, etc could be conducted annually, once in five years, etc.

Types of COEs considered in this study include:
- COEs for basic and strategic research;
- COEs for innovation and advanced technological development; and
- COEs for social and economic development.

IHERD conducted six country case studies; Sweden, Australia, New Zealand, Canada, South Africa, India (see examples in Table 2) covering a total of 12 COEs.

Table 2. COEs in various countries

<table>
<thead>
<tr>
<th>Main Orientation</th>
<th>COE Scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Basic and strategic research</td>
<td>• Linneus Environments (Sweden)</td>
</tr>
<tr>
<td></td>
<td>• University Grants Commission Inter-University Centres (India)</td>
</tr>
<tr>
<td></td>
<td>• Network Centres of Excellence (Canada)</td>
</tr>
<tr>
<td></td>
<td>• Australian Research Council’s COEs (Australia)</td>
</tr>
<tr>
<td></td>
<td>• The DST-NRF COE programme (South Africa)</td>
</tr>
<tr>
<td>B. Innovation and advanced technological development</td>
<td>• Strategic Research centres for Industry and society (Sweden)</td>
</tr>
<tr>
<td></td>
<td>• Indian Science Agencies Centres of Excellence (India)</td>
</tr>
<tr>
<td></td>
<td>• Centres of Excellence in Research and Commercialization (Canada)</td>
</tr>
<tr>
<td></td>
<td>• VINN Excellence Centre (Sweden)</td>
</tr>
<tr>
<td>C. Social and Economic Development</td>
<td>• Centres of Research Excellence (New Zealand)</td>
</tr>
<tr>
<td></td>
<td>• Business Led Centres of Excellence (Canada)</td>
</tr>
<tr>
<td></td>
<td>• The Cooperative Research Centres Program (Australia)</td>
</tr>
</tbody>
</table>

Coming out of the case studies three domains of a national CoE systems have been noted: 1) science 2) research policy and 3) socio-economic (Table 3). Challenges in building local/national capacities relate to attaining and maintaining a critical mass of researchers, human capital, and policy capacity.
Table 3. COE impacts on different domains of STI system

<table>
<thead>
<tr>
<th>Science system</th>
<th>Research policy system</th>
<th>Socio-economic system</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Knowledge benefits from scale and aggregation;</td>
<td>• Reduction of transaction and search costs (for funders, stakeholder and researchers).</td>
<td>• Ease of access for industry and civil society (facilitates triple helix arrangements)</td>
</tr>
<tr>
<td>• Positive externalities from scale and aggregation (i.e. to region and universities);</td>
<td>• Benefits priority setting and predictability in the research system.</td>
<td>• Vehicle for opening up new areas of learning, e.g. for purposes of social improvement</td>
</tr>
<tr>
<td>• Improves professionalisation of public research;</td>
<td>• Facilitates international visibility and network access.</td>
<td>• Access to expertise for policy makers</td>
</tr>
<tr>
<td>• Building this is very basic as innovation depends on this science system.</td>
<td></td>
<td>• Compatible with Grand Challenges type pursuits (policy directed critical mass)</td>
</tr>
</tbody>
</table>

Table 4. Summarises what is emerging on capacity building

<table>
<thead>
<tr>
<th>Critical mass</th>
<th>Human capital</th>
<th>Policy capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Where national systems lack critical mass in any field, COEs’ focus on resource concentration attempts to addresses 3 Challenges (Kearney, 2009); those posed by expansion of higher education to meet increasing demand, dilution and redirection of possible resources for research, fragmentation of research.</td>
<td>COEs emphasise human capital development (expertise and research training capacity etc), for the science and HEI system (as opposed to publication oriented emphasis of the traditional project funding approach). Schemes require professionalisation of research organisations, including funders that may build capacity for priority setting and more systematic evaluations of the research effort in the research system as a whole.</td>
<td>Policy infrastructure for developing and managing objectives as well as processes must be developed. Research funders are more actively involved in priority setting and research governance through COEs</td>
</tr>
</tbody>
</table>

Two overall understandings are that:

1. Most critical aspects of COE are borne out from Indian and South African experiences.
2. Whilst the framework can be taken to be relevant across various countries, this does not mean that there are no local/national/continental factors or milieus which give rise to different scenarios of COEs.

With these understandings, the presenter said that the Indian case presents three models of COEs: 1) COEs established by leading scientists/groups—these emerged in an organic mode, an example is Indian Association of Cultivation of Science, Calcutta (1876), 2) public policy-driven COEs in the academic sector (Table 5), and 3) policy-driven COEs under govt agencies, partly in PPP mode (Table 6), each playing roles (Table 7).
Table 5. Public policy-driven -COEs in the Academic Sector

<table>
<thead>
<tr>
<th>Administering Agency</th>
<th>COEs Institutes/Universities</th>
<th>Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>UGC</td>
<td>Inter-University Accelerator Centre, established 1984</td>
<td>Nuclear Sciences</td>
</tr>
<tr>
<td>UGC</td>
<td>Inter-University Centre for Astronomy and Astrophysics, 1988</td>
<td>Astronomy and Astrophysics</td>
</tr>
<tr>
<td>UGC</td>
<td>Inter-University Centre for International Relations 2010</td>
<td>International Relations</td>
</tr>
<tr>
<td>UGC</td>
<td>46 Universities chosen for potential for excellence 198–2012</td>
<td>Frontier areas S&amp;T areas, Bio, telecom, mobile computing, nano, genetics.</td>
</tr>
<tr>
<td>UGC</td>
<td>97 Colleges with potential for excellence 2002–2012</td>
<td>Social and natural sciences</td>
</tr>
<tr>
<td>DST - PURSE</td>
<td>44 Universities 2009 - 2011</td>
<td>Social and natural sciences</td>
</tr>
</tbody>
</table>

Table 6. COEs in public research labs/departments -45

<table>
<thead>
<tr>
<th>Govt. Science Agency</th>
<th>No of COEs</th>
<th>Areas</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBT</td>
<td>9</td>
<td>Biomedical sciences</td>
<td>2007 – 2011</td>
</tr>
<tr>
<td>Ministry of Urban Development</td>
<td>9</td>
<td>Urban problems</td>
<td>2009</td>
</tr>
<tr>
<td>Defence Research and Development Organisation</td>
<td>5</td>
<td>Strategic science and technology</td>
<td>2011</td>
</tr>
<tr>
<td>Department of Telecommunications</td>
<td>7</td>
<td>Telecommunications</td>
<td>2009 – 2011</td>
</tr>
<tr>
<td>Department of ICT</td>
<td>15</td>
<td>Nano, disaster management, urban, telecom, intelligent systems.</td>
<td>2002 – 2012</td>
</tr>
</tbody>
</table>

Table 7. Types of COEs and role in NIS

<table>
<thead>
<tr>
<th>COEs in Organic Mode (leading research institutes/centres)</th>
<th>COEs in Academic Sector (Inter-university centres) ( universities and colleges)</th>
<th>COEs under govt. agencies &amp; PPP (Min of Urban Dev; DRDO; Min. ICT; DBT and Vikram Sarabhai SAC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Quality research and advancement of knowledge,</td>
<td>• Help universities to improve infrastructure,</td>
<td>• Promote nationally challenging problems, such as tuberculosis, infectious diseases, disaster management, intelligent systems in transport, urban development, ICT/telecom., aero-space research, Inter-institutional linkages (PPP) Training</td>
</tr>
<tr>
<td>• Training and knowledge dissemination,</td>
<td>• Enhance institutional research capacity,</td>
<td>• Training</td>
</tr>
<tr>
<td>• National visibility in the world of science,</td>
<td>• Training via PhD</td>
<td></td>
</tr>
<tr>
<td>• Physics, mathematics, advance biological sciences,</td>
<td>• Gauge potentiality for COE</td>
<td></td>
</tr>
<tr>
<td>advanced computing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The presenter indicated the following purposes of COEs from the Indian perspective:

• Centres to advance systematic knowledge in some niche areas and fields of science.
• Building institutional research capacities in frontiers of science via training young talents,
• Creating inter-institutional and interdisciplinary platform.
• National visibility in the ‘world of science’.
• Cultivation and professionalisation of science, sustaining quality and excellence via publications.

Challenges have context specificity:

• There is a tendency to believe that ‘one size fits all’
• Strategies for COEs are almost all the same, but complexity increases as one moves down towards impacts,
• Yet, impacts are diverse and specific, often related to national needs and priorities. This is especially true for Social and Economic Development COEs.
• There is uncertainty about how to evaluate COEs. This stems from the fact that COEs are just as much organisations as research projects. Should one evaluate the organisation (its processes, e.g. leadership) or the research products (e.g. articles, patents and innovations)?
• A tension between evaluating in terms of scientific excellence and socio-economic development runs through many of the schemes. How to balance these goals?

Some issues

• Mere funding and creating COEs is just one step.
• Work out how to institutionalise the excellence and quality of research so that there is continuity.
• Leadership, merit, peer review and autonomy are very important.
• Creating a funding scheme for COEs has certainly enabled India to have footprints both in the world of science (atomic energy, space and astronomy) and have an impact on the socio-economic system (IT/Telecom for instance).

Presentation 3

Findings from the Case Study on Centres of Excellence—Instruments of Research and Research Capacity Development: The Case of South Africa

Krish Bharuth-Ram, University of KwaZulu-Natal, South Africa

The presenter started with a historical sketch of HEIs in South Africa since 1994, the time of the country's independence.

HEIs during 1994 – 2004

Three categories:

i) Historically advantaged ‘white’ institutions: near the big cities, well-resourced and conducting almost all the research;

ii) Historically disadvantaged institutions: under-resourced, generally far from major centres, and focussed on teaching;

iii) Technikons: offering vocational courses.

HEIs since 2004–5

Mergers of HEIs, reduced 36 institutions to 23. This has had major impact on the research capacity of some of the newly defined HEIs, as less than 40% of the academic staff at the universities had PhDs. At the Universities of Technology, less than 10% of the academics had PhDs. The present 23 HEIs in South Africa are therefore very different organisations. In terms of their research funding secured from the NRF in 2011, they fall into three clusters:

• Cluster A: NRF Funds ≥ R 100 million- 4 universities
• Cluster B: NRF Funds: R20 – 100 million- 9 universities
• Cluster C: NRF funds < R20 million- 10 universities.

**COEs in South Africa: Rationale**
The rationales for COEs in South Africa are to:
- Integrate several smaller and related research initiatives into large science programmes (partnerships between HEIs);
- Achieve economies of scale - personnel, equipment, data and ideas;
- Achieve a critical mass of supervisory capacity and mentorship;
- Allow for planned long-term research;
- Promote collaboration and interdisciplinary research;
- Retain, attract, sustain and improve scientific excellence;
- Promote knowledge and HCD in strategic areas;
- Develop an internationally competitive research training environment;
- Enhance the international competitiveness and visibility of SA science;
- Promote diffusion and exploitation of the knowledge produced by HEI’s;
- Ensure secure and stable long term funding for COE research;
- Reduce micro-management.

**HCD-NRF Pipeline (2011–2020)**

<table>
<thead>
<tr>
<th>Budget Year</th>
<th>Studentship</th>
<th>Thuthuka PhD track</th>
<th>Postdoc</th>
<th>Thuthuka Post-PhD track</th>
<th>Thuthuka Rating track</th>
<th>Competitive Funding for unrated Researchers</th>
<th>Competitive Funding for rated Researchers</th>
<th>Incentive Funding Rated</th>
<th>Competitive Funding Rated</th>
<th>Blue-sky Research</th>
<th>SARChI</th>
<th>CoE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008/09</td>
<td>183.20</td>
<td>5.65</td>
<td>23.09</td>
<td>2.38</td>
<td>5.67</td>
<td>-</td>
<td>10.50</td>
<td>-</td>
<td>-</td>
<td>100.01</td>
<td>51.15</td>
<td></td>
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**SOURCE:** Presented by the resource person

**COEs Primary Framework Conditions**
- Taking the lead in cutting edge research:
  - leading researchers working on cutting edge research,
  - national and international research collaborations, and
  - exceptional training grounds for research students and young researchers.
- Building research capacity:
  - training the next generation of researchers,
  - addressing transformation imperatives, and
  - partnerships between historically advantaged and disadvantaged institutions.
- Building South Africa’s research standing:
  - bring SA research output on par with best in the world.
• Positioning South Africa to lead in the knowledge economy
  o equip young researchers with skills and knowledge that will make SA a leader in the knowledge economy
• Researching key questions for South Africa
  o research key questions of strategic importance to South Africa
  o think ahead and scan the horizon for future challenges

**COEs Selection and Establishment**
1. NRF invites pre-proposals on identified themes of national importance.
2. Assessment of the pre-proposals is made in accordance with set evaluation criteria.
3. The process then follows one of two routes:
   a. *Development Route*: Pre-proposal falls short of the selection criteria, but is identified as having potential or is of strategic importance, seed funding is provided for further development of the pre-proposal and re-submission.
   b. *Recognition Route*: Pre-proposal meets the selection criteria. Research leader/host institution invited to submit full proposals with details of the research and capacity development plans of the proposed CoE.
4. Selection and establishment: Discipline-specific selection panels review full proposals; recommendations serve before NRF/DST Committee and then funding decision is made.

**COEs Conditions of Grant**
Governance/Organisation of COEs: issues pertinent to this are institutional commitments, effective management of COEs, appropriate staffing, funding (including salary subsidy of Director, bursaries, students, support staff, and equipment grants).

**COEs Monitoring and Evaluation**
Activities:
1. Research and research capacity development and training + transformation
2. Information brokerage: provide access to a highly developed pool of knowledge, maintain databases, and promote knowledge sharing and knowledge transfer.
3. Networking, national and international (including Africa)
4. Service rendering- to government, civil society, community organisations

**Monitoring and Evaluation**
Takes three forms: 1) annual monitoring, 2) international 5 year review, and 3) final end-phase evaluation.

**COEs in South Africa: List, hosts, and collaborators**
1. *Centre of Excellence in Invasion Biology*
   Host Institution: University of Stellenbosch
   Collaborators: CSIR, SAIAB, Rhodes University, Nelson Mandela Metropolitan University, Walter Sisulu University and Universities of Cape Town, Free State, KwaZulu-Natal, North-West, Pretoria and the Witwatersrand.
2. *Centre of Excellence in Tree Health Biotechnology*
   Host Institution: Forestry and Biotechnology Institute, University of Pretoria,
   Collaborators: The CSIR, Medical Research Council and University of Stellenbosch.
3. *Centre of Excellence in Catalysis*
   Host Institution: University of Cape Town
   Collaborators: Stellenbosch University, Nelson Mandela Metropolitan University and Universities of Cape Town, Limpopo, Johannesburg, Free State, KwaZulu-Natal, North-West, Western Cape and the Witwatersrand.
4. *Centre of Excellence for Epidemiological Modelling and Analysis*
   Host institution: University of Stellenbosch
Collaborators: The Agricultural Research Council, Universities of Cape Town, KwaZulu-Natal and Witwatersrand, and Zimbabwe's National University of Science and Technology.

5. Centre of Excellence for Biomedical TB Research
Co-hosts: University of Stellenbosch and University of the Witwatersrand
Collaborators: National Health Laboratory Service and the Medical Research Council

6. Centre of Excellence in Birds as Keys to Biodiversity Conservation
Host Institution: The Percy FitzPatrick Institute, University of Cape Town
Collaborators: Stellenbosch University, and Universities of Cape Town, Pretoria and Witwatersrand.

7. Centre of Excellence for Strong Materials
Node: University of the Witwatersrand,
Collaborators: Mintek, NECSA, Nelson Mandela Metropolitan University, and Universities of KwaZulu-Natal, Johannesburg and Limpopo.

8. Applied Centre for Climate and Earth Systems (ACCESS)
Host Institution: Council for Scientific and Industrial Research (CSIR)
Collaborators: Rhodes University, Universities of Cape Town, Western Cape, Witwatersrand, KwaZulu Natal and Pretoria, SANBI, SAEO, SA Weather Service, Council for GeoScience and the Department Environmental Affairs.

**COEs in South Africa: Performance Highlights 2004–09**

Professor Bharuth-Ram sketched the performance of COEs in South Africa for the period 2004–2009 in terms of student number, number of graduates, and number of ISI publications (see Graph).

Achievements worthy of note include the following:
- strong collaborations between host institutions, Science Councils, established and formerly disadvantaged higher education institutions, and partner institutions in Africa and internationally.
- Number of research students has increased more than three fold.
- Black students constitute more than 50% of the masters and doctoral students.
• Female students constitute 48% of the masters and doctoral students, of whom 48% are black.
• The number of research publications in peer reviewed journals increased from 76 in 2004 to over 400 in 2009.

Five year Review of the COEs Programme in South Africa: Main Findings
1. All the COEs have met all the aims of the programme.
2. The COEs have performed exceptionally well and are internationally competitive.
3. The COEs have been proactive in:
   • the recruitment of black students,
   • mentorship programmes at the undergraduate level, and
   • development of school programmes and nodes on predominantly black campuses.

Nevertheless, the majority of black students have been recruited from other African countries.

Main Recommendations
The DST/NRF should continue funding each of the COEs for a further 5 years.
The DST/NRF should continue the COE Programme and run another bottom-up competition as soon as possible.

Comments by the Lead Commentator

Dr. Ebrima Sall, CODESRIA Executive Director
Commented that:

1. Innovation, HE, research and development cannot be detached from the process of emergence and development of scientific communities, which is a long process; and it is a process in which both the scholars and policy makers are engaged, and share the goal of moving the frontiers of science and knowledge. The Indian case is a very good illustration of this. Krishna, in his earlier work on the emergence of the scientific communities, shows how the vision and ambitions that Nehru had in terms of the advancement of science and technology in India in the 1940s have been important, for Nehru mobilised state resources to support HE, research and science and technological development. The process requires a vision.

2. The process is a long one, requiring a long-term engagement on the part of the state, and other key stakeholders. As has been argued already, there are no short-cuts; there are also no easy or cheap solutions. Therefore, we should view the emergence of strong innovation, HE, and research systems in the longue durée; we should also adopt a holistic and a systemic approach to innovation, HE, research and development.

3. Although there are “no short-cuts”, it has been proven that where the vision, the resources and the political will exists, it is possible for HE, research and knowledge production to advance quite rapidly; for instance, Krishna’s paper for this meeting shows that China has overtaken India in terms of knowledge production. When I asked him what the explanation was, he said China has invested more in promoting and developing HE, research and knowledge production in recent years than India, and China continues to do so. The experience of the BRICS also illustrates the possibility of poverty reduction and significant improvements in infrastructure and in peoples’ living conditions over relatively short periods of time. Furthermore, as Thandika Mkandawire argued in a keynote lecture he gave in Dar Es Salaam in April this year, change and development in Africa have leapfrogged in some areas; e.g. the African countryside skipped the landlines in terms of telephone use: from the absence of phone lines and connections, the African countryside moved straight into the mobile phone era, and one can find mobile phones almost everywhere in Africa. Therefore, we can also, with a vision and adequate support from the state and other stakeholders, be quite optimistic about the possibilities for innovation, HE, research and knowledge production moving forward in Africa.
4. The context is favourable:
   a. There is a worldwide recognition and acknowledgement of the importance of HE and research for the building of knowledge economies and societies.
   b. There are a number of important initiatives geared towards promoting HE, research and innovation in Africa: the AU’s Pan African University project is a good example; Senegal had a national dialogue on the future of HE in that country in April 2013; South Africa has been doing a lot already, Department of S&T; the Council of HE; the Human Sciences Research Council, the National Research Foundations’ COEs and Research Chairs, more recently, the creation of a Ministry of HE, and the adoption in 2012 of a Charter for the Humanities and Social Sciences and subsequent establishment of an Africa Institute for the Humanities and Social Sciences. The many initiatives aimed at supporting PhD programmes in Africa are an important part of the effort to nurture new generations of scholars and promote excellence in teaching and research, etc. The problem, however, is in the fact that the different initiatives are disconnected, and there is no overall vision and strategy linking all of them. The AU needs to come up with a vision and strategies that would link events at the national, sub-regional and continental levels.

5. Regarding the instruments and modalities for funding, we need “a mix of instruments”: both ‘block grants’ and competitive modes of funding are needed as are COEs. But, the context in Africa is still very difficult. Many institutions are under-resourced and block grants can help them perform better. Some amount of competition can help in boosting efforts and stimulating the desire to perform better in terms of research and production.

6. With regard to COEs, more specifically,
   a. Their great value and potential for boosting capacity, research and knowledge production has been clearly demonstrated by the Indian and South African cases presented. The COE is therefore a very good instrument, and it is a flexible instrument that can be adapted to different contexts and usages.
   b. However, the case studies on South Africa, India and the African Union’s Pan African University show a strong bias for the natural sciences. None of the eight COEs established by the South African National Research Foundation (NRF) is in the social sciences and humanities (although some of the NRF research chairs are in the social sciences). In India, of the seven inter-university COEs reviewed in the case study, only three include the social sciences and humanities in their work, and the figures are quite telling: 74 universities, out of the 500 in India, and just over 100 colleges out of the 26,000 in India have their work in the social sciences linked to the work of COEs. Yet, we can’t seriously think about making the social and natural sciences work together in the innovation, HE, research and development processes if the social sciences are brought into the equation and treated as if they are less important than the natural sciences. The policy makers and our colleagues in the natural sciences must therefore remember that innovation is not only ‘technical’: it also takes place in social and economic organisations and in ways of doing things; innovation also takes place under particular social, economic, cultural and political contexts. One of the major obstacles to the development of HE and of economies in Africa has to do with governance problems, the conflicts and civil wars during which some universities have been run down and scholars harassed, some killed, and many forced to go into exile.
   c. COEs should not be conceptualised as isolated institutions: they should be, as the existing ones are, part of larger systems of HE, research, innovation and development. The large increases in the number of public and private universities and other HEIs means that the strong universities and COEs must be closely linked to other institutions in deliberate and organised ways in order to continue having a positive impact on innovation, HE, research systems and processes.
d. The rapid expansion of the HE sector makes COEs run the risk of being drained of part of their resources (teaching and research staff, teaching materials, etc.). Support for HE, research and innovation should therefore not be confined to or challenged through COEs, particularly if we want to seriously address the challenge of nurturing new generations of scholars, and strengthening HE and research systems of the continent in a comprehensive way.

7. Regarding 'meta-instruments', there are already many cross-national and cross-continental North-South, South-South and South-North-South research collaborations, and research consortia. Meta-instruments could help that process. The only problem is that so far, most North-South collaborations in HE and research are initiated by northern institutions, which has implications for the kinds of exchanges, and the capacity building and research agendas of those collaborations. More initiatives should come from the South, for both South-South and South-North collaborations.

8. Support for HE, research, and innovation in Africa is very closely linked to the 'development industry', which is fine, because it makes the issue of relevance and application or implementation much easier. However, research should not be straight-jacked to serve immediate or short-term policy or development concerns: research should help in preparing for the long-term, including unforeseen developments, and basic research in a broad range of fields is the condition for sustaining the quality and relevance of applied and policy research.

Further points included the following:

• A process in which researchers and policy makers come together is important; this requires a vision and long-term commitment.

• China and India are making use of technology to fight corruption; it is time Africa learns from those experiences.

• Public support for HE, research and innovation is a necessity and prioritisation of areas of support is key for any country to better solicit such support.

• The processes of designing desired strategies and policies are important; Senegal has embarked on such initiatives. Collecting and repositing national and regional innovation and research systems is useful in informing such processes.

• Chilean centres of excellence and researcher engagements could help create a difference, modalities of creating centres of excellence and the processes are decisive. Centres of excellence should also take into account public interest; should be connected with social sciences and humanities; and should find better ways of ensuring quality so that they continue to be centres of excellence.

• Internal as opposed to external research funding is best; this determines how you set the development agenda. It is very difficult to articulate one's own research priority agenda while being under the pressure of development aid and external research funding.

Discussion

Comments:

• We have heard about the result-oriented project management approach in research, which is good for applied research. This, however, does not mean that the basic research disappears.

• The points raised about funding modalities and the need to increase internal funding capacity is evidently important.

• IRD is organising a workshop on writing grant proposals and supporting themes of young researchers. Such efforts could benefit developing countries through creating the technical capacities in fund raising.

• The idea of COEs does not include the issue of quality and the strategic areas in which one is a centre of excellence. These days, it has become common to see and hear a number of
organisations calling themselves COEs, just to win the attention and support of funders and policy makers. But little is known about what areas, under what ethical considerations, at what level of dissemination, and under what M&E and quality assurance mechanisms they qualify to be COEs. Therefore, efforts to establish and sustain COEs should take into account such critical parameters so that we can talk of COEs per se; otherwise, the concept of COEs can easily run the risk of being misused for pseudo-COEs.

• We need a framework to define what a COE is in the academy; otherwise, people choose to call themselves COEs. This issue requires further discussion, in connection with the Pan-African University and in the presence of colleagues from same. In fact, regional coverage could influence the effort to conceptualise and define COEs.

• It is important to have a systems approach in analysing the modalities of funding that exist. The systems approach includes a basket of modalities in which higher education research and innovation needs can be accommodated. Centre of excellence is just one of the baskets, not all; communication and dissemination are vital. At the same time, articulating information sharing on models and instruments of access to funding is critically important.

• Public support to research funding calls for rolling back the state; differentiated higher education system would be important to effectively use scarce resources. However, care should also be taken to use STI funds to the service of the communities; in the context of South Africa’s focus to fund clusters of research organisations for funding, public money may end in the private sector.

• Some participants indicated that they would have appreciated to learn of a case study of COEs in smaller countries rather than those of bigger ones like South Africa and India.

• A comment was made that we have to be clear and have a common understanding of what makes a COE; otherwise we may end up like blind people who went to a zoo and touched an elephant. The one who touched its trunk came back saying it was like a python. The one who touched its leg said an elephant is like a tree; and the third one who touched its side said it was like a house. We should be able to tell a centre of excellence when we see or examine one. To become a centre of excellence, such an institution has to be excellent in capacity, infrastructure, knowledge creation, training and capacity development, dissemination and quality at all levels. Excellence is a process achieved over years.

Questions
1. Is it not important to support researchers?
2. What are the criteria to evaluate the critical mass of researchers needed? Where does it start and where does it end?
3. Would COEs enable systems to create job opportunities?
4. What are the impacts of the Lucy Centre, Nature, and National Geography, etc that are commonly widely disseminated in Ethiopia?
5. Concerning research funding instruments,
   a. Are COEs researches’ initiative or that of policy-makers’?
   b. Can we have certain average points as thresholds for defining COEs?

Responses from the Presenters
• Yes, basic research would not be vanishing; but the priority depends on the context and the feasibility in terms of technology and capacities.

• The critical mass looks at the numbers of excellent leaders and managers of scientific research, innovation and dissemination; most of the projects relating to COEs entail a large team of experts and senior researchers. But, what is a critical mass depends on the context and field or nature of a program; these need to be taken into account in discussing critical mass.
• The OECD programme looks into the funding window or scheme in terms of the COE. The OECD approach to research and innovation funding also takes into account the family of funding agencies in the area, such as South African and Canadian cases; in the context of South Africa, COEs are contextualised, a case in point is a COE for students. There are also centres of competence.

• With regard to COEs, there are some organisations that request huge amounts of funding in using the term COE. This negatively reflects against them in the actual ranking of their status.

• Regarding the dichotomisation between a social scientist and a natural scientist, there are well defined differences as well as opportunistic discoveries that are cross-cutting to both the social and natural sciences; funders find it easy to fund a well-defined program. Senegal takes science and technology to include mathematics, humanities, philosophy as well as the social and natural sciences. We recommend that the respective countries embrace the RTI importance and roles of both the social sciences, humanities and philosophy as well as the natural sciences.

• The Lucy Historical sites and National Geography promotion efforts in Ethiopia are in fact playing a positive role in building the country’s image and enhancing the tourism industry. Integrating such efforts into curricula and supporting them with research and STI would benefit African countries.

• While publishing in established reputable journals is a good requirement, we should also be aware that well established journals usually suppress the evolution of local new journals.

• Research and innovation policy and innovation system approach used to be seen as interchangeable, while they are two things. We are now seeing these separately as research policy guides funding modalities. Regarding the systems approach, it requires theories and funding instruments that fit and explain situations of most developing countries. We go for a bottom up approach in setting priorities to be addressed by research and innovation.

• Regarding the need for COE experiences in small countries, one of the presenters indicated that he had spent 1.5 years in Singapore, which does well in basic research and innovations in the area of biological sciences. He concluded that country size is not a significant predictor of the quality and effectiveness of COEs.

• Regarding the CEO definitions, the strategic area which the COE focuses on developing is one of the defining features.

### Session III: Leadership and Management of Research at Institutional Level

The key questions this Session aimed to address were the following:

- What are the necessary skills and knowledge requirements at policy and institutional levels for managing research and innovation in Africa?

- How can skills and knowledge be best developed and harnessed in Africa?

- What can African countries learn from other developing countries?

**Moderator:** Alma Maldonado, Educational Research Department, Centre for Advanced Research, Mexico

**Presenter:** James Otieno Jowi, Executive Director, African Network for Internationalisation of Education (ANIE), Kenya

**Lead Commentators:**
- Benigna Jesus Zimba, Eduardo Mondlane University, Mozambique
- Paschal Mihyo, Executive Director, Organization for Social Science Research in Eastern and Southern Africa (OSSREA)

This theme saw a single presentation of comparative analysis of Research and Innovation Management in three African countries: Ghana, Kenya, and Uganda.
Presentation


James Otieno Jowi, Executive Director, African Network for Internationalisation of Education (ANIIE), Kenya

Mr. Jowi’s presentation had two parts: Part A in which he discussed the typologies of research and innovation management at institutional and policy levels; and Part B, in which he presented findings of the comparative case study of Kenya, Uganda and Ghana— their national policy frameworks and institutional levels as well as the role of partnerships.

Part A: The Typologies of Research and Innovation Management at Institutional and Policy Levels

Six broad themes of the typology were identified: 1) leadership in R&D by governments; 2) leadership of research in institutions; 3) management to support leadership of research in public institutions; 4) leadership of researchers in institutions; 5) management to support leadership of researchers; and 6) personal behaviours and qualities of research leaders and managers.

1. Leadership of R&D by Governments: Key areas of decision-making are:
   - **Funding arrangements:** level, funding modality, funding organisation;
   - **Research organisations:** universities, research institutes, hospitals, think-tanks, national labs, etc; and
   - **Governance:** decision-making process, priorities, linkages between evaluation and funding, and legislative framework.

Increased importance is directed towards international collaboration.

2. Leadership of Research Institutions
   - **Institutional governance:** Strategies and performance frameworks;
   - **Implementing institutional change:** Such as staff planning and infrastructure planning;
   - **Ethos:** Strong research culture, incentives and rewards;
   - **Risk:** Related to research, finances, infrastructure, etc.;
   - **Communication:** Communication with staff and governments.

3. Management to Support Leadership of Research in Public Institutions
   - **Organisational structure:** Critical mass, inter-disciplinarity, infrastructure, effective administrative support, etc.;
   - **Executive and management operations:** Clarity of positions and roles;
   - **Committee operations:** Balance between purpose, frequency and effectiveness, etc.
   - **Research management and administration:** Research support, translation/commercialisation, financial management, asset management and performance data analysis, etc.

4. Leadership of Researchers in Institutions
   In this connection, requirements for leadership of researchers were discussed; research students; post-doctoral and early career researchers; established researchers; and leadership of institutions.

5. Management to Support Leadership of Researchers
   - **Research student management:** Enrolment requirements, supervision arrangements and training, monitoring progress and support, examination process, etc.
   - **Staff management:** Position descriptions, performance expectations, responsibilities and accountabilities, contract arrangements, advising on research integrity, staff development, staff surveys, etc).
Part B: The Three Country Cases
The typology was also to be used to assess the situation in developing countries; as such, it pondered on Ghana, Kenya and Uganda cases. National policy frameworks and institutional levels hinged on the context of HE, research and innovation in Africa are vital. Comparison to other world regions reveals increasing societal demands on Africa’s HE, the centrality of research and innovation, low investments and support to research and innovation, an expanding sector with poorly coordinated/fragmented research capacity, infrastructure and capacity for generation/utilisation of scientific knowledge, some developments/efforts, research and innovation remain vital.

National Frameworks and Policies
The three country cases indicate that:
• National policies exist and are getting aligned to continental frameworks, such as *STI Consolidated Action Plan, 2006–10, the African Science Technology and Innovation Indicators (ASTII) Program*. The ASTII aims to build capacities to produce internationally comparable STI indicators across Africa (NEPAD 2010).
• National development plans emphasise the role of STI and research in eradicating poverty, promoting growth and development.
• Research is beginning to gain ground in national plans.
• All three countries conduct national STI surveys.

National STI Policy Blueprints
**Ghana**
• National Science, Technology and Innovation Policy (2010);
• Ghana Growth and Poverty Reduction Strategy II (2006–09);
• Ghana Vision 2020; and
• Provide the framework for mainstreaming research and innovation into Ghana’s growth and economic development.


**Uganda**
• National STI Policy (2009), Comprehensive National Development Planning Framework, National Development Plans and Uganda Vision 2040; and
• Current National Development Plan (2010): Ugandan universities to generate knowledge and innovations to tackle local development problems.

The 2012 Global Innovation Index puts Uganda at position 117 with a score of 25.6 (INSEAD/WIPO 2012).

**Kenya**
• Kenya Vision 2030 (Kenya 2007);
• Ministry of Higher Education Science and Technology Strategic Plan 2008–2012 (Kenya 2008); and
• National STI Policy and Strategy (Kenya 2009),

The 2012 Global Innovation Index puts Kenya at rank 96 with score of 28.9 (INSEAD/WIPO 2012).

Governance Frameworks for STI
• National governance frameworks are emerging;
• The three countries have STI governance initiatives; and
• Have many similarities.

**Ghana**
• National Development Planning Commission (NDPC);
• Ministry of Environment, Science and Technology (MOEST);
• Ministry of Education (MOE);
• Council for Scientific and Industrial Research (CSIR); and
• National Council for Tertiary Education (NCTE).

These agencies provide the institutional framework for STI governance and strengthening in Ghana.

**Uganda**

- Uganda National Council for Science and Technology;
- Uganda Millennium Science Initiative (2006);
- Ministry of Education and Sports; and
- Uganda's STI governance landscape is less elaborate and less integrated.

No ministry for 'higher education' or science and technology. The Uganda National Council for Science and Technology (UNCST) is based in the Ministry of Finance.

**Kenya**

Kenya created an independent RIT sector to spearhead the National Innovation System. Key agencies to revitalise and drive STI are the following:

- National Council for Science and Technology;
- National Economic and Social Council;
- Research Innovation and Technology Sector;
- Ministry of HE Science and Technology; and
- Commission for University Education.

**Institutional Frameworks**

These were generally the same in all cases:

- Had research mentioned as key activity.
- Government funding for research is negligible.
- They had research management in their governance structures.
- They are not cascaded to lower levels/ departments.
- They have central research coordinating office.
- They lack institutional infrastructures
- They have leadership challenges at all levels.
- They have policy frameworks, coordination and communication.
- Aim for specialised human resource capacities.
- Have no research agenda and no departmental levels; they are individualised and not suitable for job progression.
- Have problems in governance or management of research.
- Promulgate incentives for research;
- Lack of research tradition/culture.
- Poor strategies, e.g. unplanned institutional expansion.
- Provide for expansion of graduate programs.
- General emphasis on developing capacities and skills.

**Funding of Research and Innovation**

- Inadequate funding is a main perennial challenge to HE sector.
- Gross Expenditure on Research and Development (GERD) is low; Africa spends only 0.4% of its GDP on R&D.
- Government is main source of funds for three countries.
- Only Uganda has some increase in research funds.
- The inadequacy of research funding has serious implications on research outputs and innovation.
- Research funds have to be augmented by external sources.
- Research funding determines research agenda/relevance.
Human Capacity Deficits

- A serious constraint
- Aging faculty
- Soaring student numbers
- Inability to regenerate-graduate enrolment
- Low enrolments in graduate programs
- Impacts of brain drain
- Developing the new generation group
- Mentoring early career researchers
- Diversification of HE
- Institutional frameworks and capacities for research

Rebooting Africa

- The research and innovation situation in Africa needs redressing; there are capacity and skills gaps.
- Has enormous unprecedented opportunities
- Knowledge and development are exponential, not linear.
- Africa can access enormous resources from all over the world; where there is technological abundance.
- The low cost of entry into the global knowledge economy.
- African governments must take the lead in initiating and mobilising support for HE and STI in Africa.
- Global responsibility and support remains crucial.
- The pockets of success in some African countries need to be replicated.
- The new sense of Afro-enthusiasm should be vitalised.
- Youth abundance in the continent is a timely opportunity to tap.
- We must seize the moment

Comments by the Lead Commentators

Comments by Benigna Jesus Zimba, Eduardo Mondlane University, Mozambique

Ms. Zimba drew from the presentation key lessons for the way forward, the major challenge, what is lacking, and ended with a key question for discussion. The following are her comments

**The way forward**

1) The three country case studies demonstrate that trans-national and trans-disciplinary partnerships among universities and represent one of the most effective options for strengthening research capacity and governance arrangements for research and innovation in sub-Saharan African (SSA) countries.

- Knowledge-based development as opposed to higher education for human power development. Key role of Africa's *Science Technology Innovation Consolidated Action Plan 2006–2010* (AU 2006); following this Plan, the Government of Ghana, for instance, launched the *National Science, Technology and Innovation Policy* (2010) which became a key policy document on research and innovation programmes in the country. As shown in the case studies of Uganda, Ghana and Kenya, this new pattern of development is grounded on knowledge produced through research and innovation activities and constructed broadly as Science, Technology and Innovation. With this approach, there is an increasing convergence between STI (science technology, and innovation) and national development policy. Similarly, Kenya and Uganda have also launched national programmes to boost economic development framework based on the application of STI and advanced knowledge.

- Concerning national frameworks for research and innovation management, a common feature across the three countries is a strong but relatively recent focus on promoting STI governance through sets of policy instruments. In Uganda, for example, the *Uganda
National Council for Science and Technology (UNCST) is the recognised national agency with the responsibility for regulation, coordination and policymaking on national research policy (UCST 2011).

2) **These studies demonstrate the need for systematic and coherent approaches to integrate STI Policy into national economic and development strategy.** This embedding process should accord particular emphasis on the coherent translation and cascading of national development goals and STI policies into clear action plans and intervention programmes that are directly connected to promoting economic growth and improving people’s real livelihoods.

**Major challenge**

3) **Funding** in the three countries as well as across the SSA region, funding is a major challenge to developing vibrant research and innovation infrastructure. Private-sector and competitive grants provide weak support to public universities and research institutes; small public subsidies as well as occasional international donor support are not sufficient enough to guarantee sustainability of funding that allows university researchers to bid for to promote internal resource mobilisation. Again, private funding drawn from businesses and philanthropic sources is quite rare in Africa (NEPAD 2010). As a result, research and innovation systems in the three countries and sub-Saharan region in general face severe financial deficits and lack the capacity to formulate and drive their own domestic research agendas.

- According to one of the African Union resolutions (African Union 2006), each African country should commit to spend 1% of its gross domestic product (GDP) on Research and Development. As a whole, Africa is far behind the other regions of the world as it spends only an average of 0.4% of its GDP on research and development, whereas industrialised countries spend approximately six times that amount (UNESCO 2011).

- The case-study on the three countries demonstrates that Gross Expenditure on Research & Development can be allocated to four different sectors of the national innovation system, namely: (a) the business sector, (b) government sector, (c) higher education sector, and (d) private and non-profit sector.

- Universities also set aside small funding packages for research; however, the bulk of university research funds originate from development partners and the private sector through contract research, joint ventures, licensing and trademarks (Makerere 2008:9).

**What is lacking**

The case-studies on the three countries, which apply to many of the African countries, have shown that key instruments to mainstream knowledge production through research and innovation activities and construct as Science, Technology and Innovation are there.

**Main findings**

ii) STI: In Ghana, Kenya and Uganda, the policy frameworks and programme initiatives on STI are focused and inter-connected, but they still lack more coherence, complementarity and effectiveness that enable policymakers to increase capacity building in order to capture the national development priorities.

iii) The role of STIs and Universities: Despite the increasing role of both STI and universities in promoting economic competitiveness and sustainable development, across the three countries, higher education institutions require vision, resources, capacity and leadership so that science, technology and innovation becomes an instrumental and guiding principle for strategic planning at the national level and in academic programmes. The disjoint between national-level policies and institutional realities represents a major challenge to the realisation of knowledge-based economies in African countries.

iv) Institutional policies and research programmes: Ghana and Kenya represent more elaborate and dynamic governance landscapes than Uganda. All the three countries demonstrate development in effective national institutions and policies that promote research governance and nurture knowledge economies. However, the key and most persistent
weakness is the lack of national and institutional policies and programmes that stimulate collaboration and knowledge exchange between research subsystems and the industrial and business subsystems. (*The paper by Åsa Olsson addresses the issue of social and political context of research in Asian countries, whose comparative results can very well be critically analysed in Africa*).

v) The role of internationalisation: one of the main outcomes of internationalisation and globalisation is the growth in interdependence, inter-connectedness, partnerships, and mobility across global communities. Through internationalisation, African universities can adapt and develop more effective and efficient management practices in order to optimise their potential for research and innovations. (*The paper by Åsa Olsson addresses the issue of globalisation quite critically*).

Finally, and again, given the current stage of development of science technology, and innovation, how could it be used to improve research and management in Africa in connection with higher education systems?

**Comments by Paschal Mihyo, Executive Director, Organization for Social Science Research in Eastern and Southern Africa (OSSREA)**

Mr. Mihyo indicated that the First Generation Science and Technology Policies in Africa are gone and that we now have the Second Generation Science and Technology Policies. There is a paradigm shift in these policies; but not much has changed in terms of practicalities. In the past, development policies of African countries were misguided by the Structural Adjustment Programmes (SAPs) championed by the multilateral global financial institutions. As those policies were stipulated in favour of import-led growth, the attention for HE, research, STI and policies on these was almost negligible. After the SAPs, Africa is trying to go back to export-led growth based on manufacturing. This creates better space for HE, research, STI and policies to be considered crucial for the continent. Accordingly, it is promising that governments of many African countries are embedding STI in every policy.

By the same token, recognition of the role of social sciences is increasing bit by bit; but we are not training innovators (industry-orientation of the economy) and funding is inadequate for that.

Apart from South Africa and Egypt which have research funding policies and Ghana which is trying to have one, no African country has research funding policy. OSSREA sees research funding policy development as a huge divide deserving top priority. Income generation and innovation need be emphasised; we need to put new energy into innovation. At the same time, many universities need the support for strengthening STI leadership.

Another worrisome point is that as the urge for forging involvement of the private sector increases, research is being individualised rather than institutionalised; much is being commissioned to private consultancies that usually come up with sub-standard and un-institutionalised outputs and this hampers the uptake and impact of research.

- In this connection, he also referred to his in-press article in which he explored issues related to HE, STI, their governance and management as well as funding and policy issues:
  - What the mandates of universities are;
  - The research funding problems as research is relegated to consultancies;
  - Whether research is a public good or a private good;
  - There are equity issues which need to be addressed;
  - Industry is having problem of trusting credibility of research and HE quality;
  - Nobody knows what is where;
  - There is too much mobility;
  - Lack of coordination: the government, industry, HEIs and research organisations have not been creatively linked.
Discussion

Comments

• Redefining the concept ‘innovation’ along the social science-natural science continuum is decisive so that both the social and natural sciences deserve their due. Often, social innovation is not considered as innovation and that is why social science research is suffering funding constraints. Thus social innovation in the light of removing poverty and reigning equitable growth and development should be emphasised.

• In Africa, the public sector provides more jobs than the private sector does. But, the mechanism to measure innovation in the context of the public sector is different from mechanisms we can employ to measure innovation in the context of the private sector; but unfortunately, we don't have a working definition of innovation in both contexts.

• There should be social innovation in the public sector. Efficiency is desperately needed. Globally, there are few organisations like the OECD that work on strengthening innovation and innovative systems. So, rethinking the issue is important not only from the side of those looking for funding for HE, research and STI, but also from the side of the research and STI funding organisations.

• A participant from the OECD reflected their presumption that there is a governmental system responsible for innovation and setting innovation policies. In Sweden social innovation has been high on the agenda, but the trend is shifting from science technology and innovation to science, technology and industry.

Questions

1) The participant from Latin America said, ‘Before I read this paper by Mr. Jowi, I was thinking Latin America was a pioneer in policy making; but now I am feeling Africa is. But, where is this taking the continent?’

2) One of the commentators, was talking of the first and second generation STI and research policies. What happened to the first generation policies and strategies?

3) Are those policy and strategy documents in the three case study countries evidence-based?

4) What is the knowledge production plan of those selected countries?

5) What is the private HE enrolment ratio in those countries?

6) UNESCO takes 1% GNP for HE funding as a requirement. What is the experience in those countries?

7) Do those policies and strategies have an element of innovation as well? In fact, innovation has to be defined.

8) Have those case study countries set any indicators against which to gauge the STI policy achievements?

9) Much of the research funds (up to 70%) go to financing applied research and that leaves basic research disadvantaged; that is also why research projects are being individualised. Do governments have a plan for financing basic research?

10) Enhancing PPP is an important issue; South Africa is taking it seriously. The universities and the private sector should be brought to the stage. Like the demand on governments to assign 1% of GDP for research, why doesn’t industry also assign a certain portion?

Responses by the Presenter

• Mr. Jowi acknowledged the comment regarding the need to define innovation; and emphasised that they need to define not only innovation, but also a number of other technical terms such as centre of excellence, result-based management of research, and concepts that otherwise are vague and inconceivable to implement or pursue.

• Increasing the role of the private sector in STI funding is vital. There are cases in some countries where industry is aggressively engaged in funding STI that in turn enables a boost in production quality, quantity and market niches. In this regard, it was indicated that in many of
the cases and years in South Africa, funding for STI in specific industry-linked sectors is well below 1% of GDP; and even government contribution is below 0.5%. In this context, industry is contributing (though not all industries), but public funding is inadequate. But, this is not universally true for social innovation funding in South Africa.

- COMESA has a very robust Science and Technology Policy; but has not put in place funds and systems to back research capacities in the member countries. Some of the regional initiatives like the BIOEARN project in Uganda are vanishing, which is disappointing. The project was established in 1996 and had 12 universities from Ethiopia, Kenya, Uganda and Tanzania. It was funded by Sida and hosted at The Stockholm Environment Institute. A good number of PhD students were trained but when they returned, the universities and countries that had sent them were not prepared to absorb their high level capacity in biotechnology. One-by-one they started going back to the North and joining TNCs in biotechnology. If we train high level capacity without creating catchment conditions and robust research and development programmes to engage them, retain and incentivise them, most of them will still leave. While the private sector should be considered a good catchment for innovation, most of the private sectors such as small and micro enterprises have high mortality rates. In addition R&D in our indigenous private sectors is negligible. The current trend in the private sector is to import and not to innovate. Import-driven development strategies cannot support the type of innovation we are talking about. Thus, the need to curb this appalling situation and create catchment conditions for retaining those capacities and initiatives is evident.

Finally Mr. Jowi indicated that there are many policy documents; the AU is evaluating their practicability, because instead of designing new STI policies, we need to re-evaluate the existing policies and adapt practicable policies out of the existing ones.

**SESSION IV: The African Union Initiatives**

This Session was meant to address three key questions:

- **What are the main support measures to achieve the objectives outlined in the Consolidated Plan of Action?**
- **What are the current opportunities and challenges facing the Pan-African University?**
- **What are the opportunities and challenges for developing the African Union Research Grant to an African Framework Programme for Research?**

**Moderator:** Philippe Mawoko, Science and Technology Policy, Human Resource Science and Technology, African Union Commission

**Presenters:** Anshu Padayachee and Charmaine Williamson

**Lead Commentators:** Mothusi Masole, Institutional Funding, Tertiary Education Council in Botswana, Benigna Zimba, and Monica Idinoba.

**Presentation 1**

**Findings from the Study on the Pan-African University**

**Anshu Padayachee, CEO, Santrust and Charmaine Williamson, Santrust**

**Grant Making Principles—Current Paradigm**

Ms. Padayachee started by pointing out that the current paradigm of grant making principles is that they are located in development assistance/co-operation; programming is linked to policies of funder/grant-maker and beneficiary; ownership and intellectual property is vested in the grant beneficiary with acknowledgements; transparency calls for proposals; annual work programmes; equal treatment-evaluation system and publishing criteria; compliance-driven award decisions and contracting; co-financing; non-cumulative; not retroactive; and not for profit. These paradigms are categorised as strategic and conceptual.

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Strategic Paradigm

• A strategic approach for African Framework Programme for Research and towards an African Research Council (Woods, Padayachee, Olsson: 2013) through: *Africa’s Science and Technology Consolidated Plan of Action which has 2 overall objectives:*
  
i. to enable Africa to harness and apply science, technology and related innovation to eradicate poverty and achieve sustainable development; and
  
ii. to enable Africa to contribute to the global pool of scientific knowledge and technological innovations.

• Location: Development Assistance or “On Budgets” or through Partnerships
• Local Ownership: On Plan, Budget, Parliament, Audit, Report—negotiating these processes.
• Modalities: Current criteria; Excellence vs. Relevance
• Double Loop Learning and Strategy: African research grant making as a means to build capacity for other areas such as Pan African strategies and African Framework for Research and African Research Council.

Conceptual Paradigm

The conceptual paradigm constitutes notions of epistemology, ontology and pragmatism; what knowledge counts; whose knowledge is valued/counts; for what purpose are we generating and contributing knowledge; where we stand in relation to the knowledge that we want generated or produced; where the knowledge goes to (from laboratory to market?); and who our partners, collaborators and competitors are in this.

Structure


The Africa-EU Strategic Partnership Model assumes a cyclic interaction of three entities

Grant Making in the African Union Research Grant Programme

Principles included programming; where post-harvest and agriculture, sustainable energy, water and sanitation sectors are to get equal treatment through programming, open call for
proposals, and published criteria. To ensure transparency, published criteria and evaluation processes were applied to boost the ability to resolve disputes.

Based on results-based management/logical framework principles of programming and pre-conditions, vertical and horizontal logic take into account overall objectives, specific objectives, results, activities, means and resources, objectively verifiable indicators, means of verification and risks and assumptions.

**Path Dependencies**
- African Research Framework to be conceptualised, researched, consulted upon, defined and then adopted;
- Resourced: mainstream budget vs. development partnerships, other partnerships or a blend;
- Current path dependency set by the funding framework (European Union Guidelines for Call for Proposals) led to the finding that ‘relevance’ is privileged above ‘research excellence’: the entire process is regulation-driven with a defined evaluation system.

She then raised a question as to what the future path dependency would be, and who sets this agenda; noting the shift in funding of research and education from Basic towards Higher Education.

**Recommendations**
- Increase strategic orientation towards well conceptualised and evidence-based end goals.
- Build a knowledge base: modalities, centres of excellence, benchmarks, achievements, what is out there (much work done [www.AOSTI.org](http://www.AOSTI.org)).
- Determine if we want some form of “Indigenous Grant Making” (Estment 2007) “Endogenous Innovation” (Aarts and Greijn 2010) what does it ‘look like’ and how do we mediate it with the world knowledge system; global academic and innovation networks? (Altbach 2013).
- Find ways of building alternative paradigms of knowledge to achieve excellence and innovation. (Smit et al. 2013).
- Use technology in the socio-material dimensions of research practice (Vaara and Whittington 2012; Jarzabowski 2009).
- Investigate new funding modalities inclusive of: own contributions—“on budget”; private-public partnerships; (other) partnerships model linked to trade, macroeconomics: Swiss model; loan funds (guarantees; concessional; non-concessional); and philanthropy: traditional but also horizontal giving (social media-driven).

**Conclusion**
Knowledge is a new frontier, a new map which demarcates, includes and excludes as was done through colonial power and cartography. Therefore:
- We need to *know the value of our frontiers* and how we *push* those towards sustainable and human development.
- We need to *protect the non-negotiables* of our positions and frameworks.
- We need to *know* with whom and how we *collaborate* across frontiers to *compete* across frontiers.
- We need to *know our future frontiers* and how we prepare for those today.

**Presentation 2**

**The African Research Grant**

**Charmaine Williamson, Programme Manager, Santrust**

According to the presenter, COEs have the potential to enhance and improve research; build capacity; attract and retain excellent researchers; develop national and international collaborative research networks; overcome disciplinary and institutional barriers which hinder
interdisciplinary collaborative research; enhance scientific, economic and social development; and produce policy-relevant outputs.

Countries need COEs in order to develop and contribute to the production of the knowledge economy, to be innovators and to win research and innovation funding. Thus, many universities and research organisations want to be seen as COEs. In order to be competent, countries need well developed scientific and technical capability; and one of the pillars of COEs is capacity. COEs, if genuinely utilised, can enhance the capacity for uptake of basic research, applied research, and development capacity. Many COEs are cross-national in nature; thus, apart from contributing in the production of the knowledge economy, they enhance innovation, promote national and international collaboration, networks and also the creation of communities of practice, which is very important. While networks bring people together to talk and discuss issues, communities of practice are about engaging people. COEs thus enable researchers to win disciplinary and geographical barriers to solve problems.

African Initiatives

Ms. Williamson traced African initiatives since the 1960s where the focus was on building national R&D institutions that develop into COEs, but were not successful because they had no relevance or impact on economic development, made poor choices regarding short-term projects, and had insufficient funding.

The 2006 AU/NEPAD Africa’s Science and Technology Consolidated Plan of Action for Knowledge Production, Capacity Building and Technological Innovation - Initiatives include: Bioscience Facility for E and C Africa at the International Livestock Research Institute, Nairobi; Square Kilometre Array; and African Laser Centre, Africa institute of Space Science which is planned.

African Network for Drugs & Diagnostic Innovation (ANDI) COEs

- 2008 – 32 ANDI COEs in Health Sciences: (4 North Africa, 5 West Africa, 6 East Africa, 2 Central Africa, 15 Southern Africa);
- Problems – Lack of collaboration within Africa and internationally, lack of funding.

African Union Council (AUC) and Pan-African University (PAU)

PAU seeks to:
- Stimulate fundamental and applied research of the highest quality in areas critical to African technical, economic and social development
- Promote integration of African scientists, academic staff, students and Diaspora
- Position African HE as a driver for social and economic development and attainment of Africa's collective vision.

PAU selected 5 areas and created Pan-African University Institutes (PAUI): 1) Water and energy – University of Algeria; 2) Life and earth science – University of Ibadan, Nigeria; 3) Space Science for Telecommunication; 4) Basic Sciences, Technology & Innovation – Jomo Kenyatta University, Kenya; 5) Governance, Humanities and Social Sciences – University of Yaounde II, Cameroon. It has been indicated that each PAUI is linked to a network of 10 PAU centres however, there is no evidence that this has happened.

Lead Thematic Partner (LTP)

Each PAUI should be partnered by a LTP, which is expected to contribute financially to the PAUI, link PAU centres in the home country and globally, provide the PAUI with research equipment, mobilise other funders to support the PAUI, participate in the governance of the PAUI. In this regard, Sweden via Sida is the LTP for the Cameroon PAUI.

Governance/Organisation of PAU

- PAU Council- academics, community leaders, representatives of regional economic communities, industry;
- PAU Senate- Rector, 5 PAUI Directors, LTP;
- PAU Rectorate;
• LTP establishes Board of Directors- Chair PAU President, PAUI Director, Regional Hub Leaders, students, LTP;
• Funding- Host Country, AU (Fellowships), LTPs;

Overall, the presenter commented that it is too heavy, cumbersome, inefficient and expensive.

**PAUI in Cameroon – Governance, Humanities and Social Science – University of Yaoundé II (Assessment report by S. Hagberg and A. Anderson for Sida)**

- Bids from universities from CA, expert panel but no details of composition or criteria;
- Total of 193 masters students at PAUIs, 80 at Cameroon PAUI;
- No information on PAU Centres;
- Library is inadequate & references in theses are more than 5 years old;
- Computer facilities are inadequate;
- Classroom facilities recently renovated;
- Student housing - inadequate and needs renovating;
- No long-term financial commitment from government or university.

**Preliminary Conclusions**

- Lack of publications in international peer reviewed journals;
- Researchers publish in in-house departmental or faculty journals;
- Underdeveloped research facilities;
- Lack of engagement in cross-disciplinary and multidisciplinary research;
- Lack of long-term financial commitments;
- Cumbersome governance structures;
- No details on monitoring, mid-term evaluations, reviewing of objectives etc.;
- What are some of the markers of excellence that this COE has?
- Has this COE been successful in responding to science, innovation and social challenges in Africa?
- Unlikely that the PAU would achieve its strategic objectives.

Sida’s Research Council decided against recommending funding of the Cameroon PAUI.

**Success Story – SA COE Programme**

- 9 COEs all extensively networked nationally and internationally – inter-institutional and interdisciplinary.
- Long term financial commitment- DST/NRF and University.
- Simple, direct and efficient governance- COE Boards.
- International 5 year peer reviews of each COE.
- Impressive records of original research published in high impact international journals – increased from 79 per annum in 2004 to 789 in 2011.
- Impressive records of the production of high quality MSc and PhD graduates and post-docs.
- Attracted and retained top quality staff and international students.
- Shows evidence of markers of excellence.
- Has had impact on the South African development agenda.
- Very good infrastructure; labs, libraries, internet.
- Practical and economic benefits for SA.
- Advising and interacting with relevant government departments, statutory bodies, industry and non-government organisations.
- Outreach programmes to attract scholars to science and research.
- Cost effective – R 45m p.a. ($ 5m).

**Challenge:** It has to be self-sustaining from 2018.

**Conclusion**

- Centres of Excellence are established on the basis that they exemplify advanced basic science in combination with industry application and are able to count outcomes of a substantially tangible nature especially in respect to the development agenda of a region/country.
• The major challenge in respect of the PAU COE is to identify the recurrent linkages between these dimensions, and carve out ‘packaged solutions’ that are likely to generate specific effects successfully and sustainably.
• COEs also help establish communities of practice.
• Enable it to tackle disciplinary and institutional barriers that hold back STI.
• In the context of COEs, research is not for the sake of research, but research for improving the quality of life of people.
• Governments should ensure adequate funding and international funding for STI and promote integration of African academic staff.

Comments by the Lead Commentators

Comments by Benigna Zimba, Former Focal Officer for PAU at the African Union
• She pleaded to anybody in a position to help the Pan African University and said that this is a project theoretically well-strategised but does not qualify as a centre of excellence.
• PAU came into being as a result of establishing institutes in Africa based on the criterion of regional equity. Cognisant of this reality, the AU is preparing for the establishment of a true centre of excellence sometime in 2014 in Algeria.
• However, she still pleaded to everybody to support the PAU to make it a centre of excellence.
• Dichotomising STIs as natural and social should not spoil Africa and its image.

Comments by Monica Idinoba, Focal Officer for STI programmes, African Union
• She indicated that reading the case studies, she found them missing the true picture of African research grants. She said she felt that the key people should have been consulted.
• She argued that the angle of assessment employed by the case studies was quite excellent, but there had not been a good proposal assessment done in Africa.

Discussion

Regarding the quality of the case studies on African research grants, Ms. Padayachee noted that the case studies were done by the right people a year earlier but were predominantly based on historical documents; as such they may not reflect current realities. However, the progress in HE capacity building can be implied from them. It was suggested that OSSREA and CHET (Centre for Higher Education Training) could do the evaluation of the PAU for the AU.

Ms. Williamson: When we are dealing with research grant-making, our work is either to confirm or reject what is currently available. It is highly context-specific and we in South Africa challenge research grant-making paradigms if they deserve to be challenged. Overall, we have to assess and challenge the African research-grant making paradigms. There is a complexity in the African environment, and that makes research grant-making complex.

Kwame Gbesemete from Sida clarified that the presentation about the Pan-African University is not an evaluation of PAU, but a pre-study that was commissioned by Sida. Sida has been working with PAU supporting research; but PAU remained largely limited to Francophone Africa; it didn't evolve as a COE. There is a lack of publications in peer reviewed journals; as such there is a need to revisit how the PAU is functioning and Sida's support thereto.

Regarding students attending the PAU, it was indicated that there are a number of students doing governance and language studies, but such programmes only started recently.

From CODESREA: If we are talking about whether or not the capacity exists in Cameroon for a COE, there are conceptual ambiguities. As someone has been mentioning, there is capacity in this room; there is capacity on the continent; all we need is to create effective networks.
The idea of path dependency is a very powerful one; we need to articulate it carefully. We need to learn from the experiences of regional organisations. Also the initiative of the PAU is a good one; support needs to be extended to such organisations, instead of abandoning the baby; the AU should provide effective leadership.

**Nico Cloete:** Try to establish and sustain replicas of the Massachusetts Institute of Technology. Quality and relevance would then come into picture. The EU may evaluate research funding proposals on the quality parameters regardless of their relevance for the proposing country or region. They are trying to introduce a different process with university-industry linkages. They are abandoning the issue of relevance. It is not only a matter of capacity; funding decisions relate also to how we conceptualise our needs and priorities.

Lena Johansson de Chateau from Sida questioned the academic added-value of the PAU initiative. She said that donors need to understand the political landscape for research funding. The PAU is a very complex initiative. There are complex issues surrounding the founding of the PAU in Cameroon, as well as a host of problems and limitations in locating it in Cameroon. And the issue of redefining the PAU should not be considered as dumping the baby; it is rather a matter of making the PAU account for the Swedish tax-payers’ money. In this connection, she also noted that it is a good idea that the AU takes ownership of research funding. This is something which Sida and its research funding parties are struggling for.

Another participant said that the presentation was a good one; and indicated that she was however scared as nothing positive was reflected. An evaluation has to reflect both the positives and negatives of a subject. Also the African Development Bank should have been in this meeting.

**Responses from Presenters**

- Anshu Padayachee said, “We believe that the PAU initiative is a good one. However, we need to listen to the voices of the academics; thus, we don’t have to be scared.” Different grant-makers follow different modalities; that has to be taken into account.

- The Human Resources, Science and Technology Department at the AU has a new Commissioner; let us give the new commissioner a good ground to give in-depth answers to such issues as the PAU.
SESSION V: Challenges and Opportunities for African Universities to Increase Knowledge Production

This session attempted to address challenges and opportunities for African policy makers and institutional leaders at universities and public research institutions to increase knowledge production through academic research. It also endeavoured to highlight trends on policy in public research institutions and universities.

Key questions to be addressed:

- What is needed to encourage governments and leaders of research and innovation to translate policy ambitions into focused plans of action?
- How to strengthen knowledge amongst policy makers so that they appreciate the importance of institutional autonomy, thus allowing universities to make a significant contribution to research and innovation?
- How to develop a commitment to the importance of the development of a national research ethics framework when countries develop their research capacities?
- What role can development assistance actors play to support the development and implementation of research and innovation policy at national levels? What are the limitations?

Moderator: Paulos Chanie, Director of Research, OSSREA.

Presenters: Nico Cloete and Martha K. Ferade

Lead Commentators: Venni Venkata Krishna and Berhanu Abegaz

Presentation 1

Findings of the HERANA Project, Summarised in the Report on Challenges and Opportunities for African Universities to Increase Knowledge Production

Nico Cloete, Director, Centre for Higher Education Transformation, South Africa

Africa Needs Strong Universities that take into account the following:

1. The importance of knowledge and higher education for sustainable development is global, even though there are contextual and regional differences.
2. The sustainable, long-term beneficial contribution of knowledge to development is indirect, not direct.
3. It is knowledge-generative capacity that underlies all sustainable development.
4. Traditional role: Training professionals; community service (Development Aid).
5. Knowledge production (outsourced)
6. According to the OECD definition;
   - Input refers to masters, PhD enrolment, staff qualifications.
   - Output contains Masters and PhD graduation publications (non-published research)

Higher Education Research and Advocacy Network in Africa

- Network about 50 participants 12 countries in 5th year.
- There are successful (OECD) systems that link higher education and development:
  - Europe (Finland), Asia (South Korea), US (North Carolina)
  - Africa:
Botswana – University of Botswana; Ghana – University of Ghana; Kenya – University of Nairobi; Mauritius – University of Mauritius; Mozambique – Eduardo Mondlane; South Africa – Nelson Mandela Metropolitan University; Tanzania – University of Dar Es Salaam; and Uganda – Makerere University.


Doctoral enrolments versus graduates

Senior academics at professor and associate professor level as % of total permanent academic staff 2009, 2011
Case studies for strengthening research

Five case studies:
- UCT, UKZN, Fort Hare, Nelson Mandela Metro, Tswana University of UFH
- Strong historically, poor on performance
- Apartheid – political turmoil and relatively good funding
- New SA – reduced funding, increased market completion
- First University under administration -1998
- Vision teaching and research excellence
- New leadership in 2006, strategic plan
- UFH wanted to avoid being classified a low-ranking SA teaching institution

University of Fort Hare Research

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<td>Doctoral enrolments</td>
<td>155</td>
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<tr>
<td>Permanent academics with doctorates</td>
<td>55</td>
<td>89</td>
<td>102</td>
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A differentiated public university system
Strengthening Research Activities/Functions

1. Concentration of research – themes/groups;
2. Develop researchers – staff with doctorates, support junior academics
3. Publication skills – methodology, writing
4. Incentives and rewards – direct and indirect
5. Intellectual property and commercialisation – grant management
6. Contribute to institutional policy
7. Building research culture – developing to strengthening

General Observations

To become successful in research, an institution needs:

1. strong case for research management,
2. strong indications of following the international trend of mimetic normative isomorphism,
3. expanding the professional class without proper assessment of institutional context,
4. need to bring research into the research management, copying 'best practice' stories is not enough, and
5. while promoting managerialism, confused methodology about measuring 'success' of the research office.

Critique of the Managerial Culture at the University of Botswana

Academics recently conducted a survey amongst themselves and compiled a report which contained multiple criticisms of the university's operations, including a top-heavy bureaucratic system and a growing deficit in academic staff numbers:

"The present structure has never been reviewed, instead it has grown bigger and bigger, which is why presently there are more than 25 directors, numerous deputy directors, assistant directors and managers. The governance structure is top-heavy and therefore contradicts the vision and mission of the University, and is not properly aligned to its core business." (UB Academic Staff 2012: 1)

• At the University of Botswana, academics want the university to re-focus on its academic mission.
Some years back, knowledge production was not considered a priority in Africa. However, recently, the trend is shifting though the direction of the shift is unclear and knowledge-generative capacity is underdeveloped.

In South Africa, there is a huge attention to the PhD training; 25 programs train students at PhD level.

There isn’t a pipeline between the Masters and PhD programs.
- The University of Sao Paulo produces about 1,500 PhDs annually, about 3 times the PhD production of South Africa.
- In terms of publication quality, the University of the Makarere in Uganda is one of the best.

In 2006, South Africa increased attention to PhD training and research outputs, aiming for excellence in training and research.

**Presentation 2**

**Findings on the Forthcoming Report on Mobilising the Diaspora: Brain Circulation, Knowledge Transfer, and Its Potential for African Universities**

**Martha K. Ferde (PhD), Presidential Scholar, Higher Education Policy, Harvard University**

Ms. Ferde discussed the brain drain versus brain circulation; existing initiatives and benefits of engaging the Diaspora and challenges and policy considerations.

**Brain Circulation Paradigm**

What circulates? This includes people, financial remittances, investment capital, social and cultural remittances, and knowledge and ideas.

**Brain Drain/Gain Model**

**Wide Range of Diaspora Involvement**
Markers of successful Diaspora networks include the following:
1) Ability to attract talented (managerial, creative, technically skilled) members;
2) Engaging direct and knowledge brokers and bridge-builders;
3) And robust discussion followed by action.

Source: Leveraging Diasporas of Talent: Toward a New Policy Agenda. DFID-WB Collaboration on Knowledge and Skills in the New Economy

Examples of Initiatives Linking Diaspora to African Universities
UNESCO/HP, Brain Gain Initiative, Linking African and Arab Region universities to global knowledge (engaging skilled expatriates via grid computing).

Benefits of Mobilising and Engaging Diaspora in African Universities
- Strong grasp of local context; in positions of influence with access to resources/grants in developed countries; high intrinsic motivation, strong commitment.

Potential avenues for engagement include knowledge transfer and networks, resource sharing, collaborative research, establishing programs at African universities, and mentorship.

Example of Diaspora Engagement
University Partnerships: Jimma University College of Agriculture and Veterinary Medicine (JUCAVM), Ethiopia and Dalhousie University and McGill University, Canada.

Details: Department of PHM with undergraduate and graduate training; R&D- developing agriculture-related technologies.

Harnessing Potential
- Diaspora youth tend to be transnational,
- Education choices focused on contribution to family and nation, and
- Energised, creative and self-mobilising.

Challenges
1. Identifying the Diaspora;
2. Moving from individual to institutional and national level;
3. Bureaucratic impediments and hierarchical structures;
4. Infrastructure and facilities;
5. Possible issues with ethnic/religious tensions; and
6. Moving from initiation to sustained action.

**Partial Source:** Mohamoud, A.A. (2005) *Reversing the Brain Drain in Africa*

**Policy Considerations**

1. Prioritising national development goals, identifying research/resource gaps at institutions and matching with skilled Diaspora experts in field.
2. Diverse stakeholders committed to minimal bureaucracy (university faculty and administrators, Diaspora members, government, funders).
3. Internal checks and balances.
   - What is happening in the University of Yaoundé? Cameroon presents a good example of a successful initiative of linking Diaspora to African universities.
   - In Ethiopia, efforts to increase the human resource capacity of Jimma University by mobilising the Diaspora presents another good example of the role of mobilising Diaspora for Africa’s development.
   - But, more work needs to be done on how to mobilise the Diaspora more effectively.

**Comments by the Lead Commentators**

**Comments by Venni V. Krishna**

1) The transformation of universities from institutions of teaching, cultural preservation and maintenance of knowledge towards advancement of knowledge via research has come to be known as the second academic revolution. This was triggered first by Humboldtian initiatives at the Berlin Universities around 1820s. In the United States, it happened around mid nineteenth century at institutions like Harvard and Colombia where professors, often inspired by their German doctoral mentors, sought to initiate research training and advanced degrees. The third academic revolution came about as universities progressed through further transformation taking on the role of not just teaching and knowledge production but also getting involved in the knowledge transfer and economic or regional development. This revolution signified the addition of innovation to the older functions of teaching and research. This came about more robustly with MIT and Stanford universities and their role in regional development in USA.

In the specific case of Africa the point is that a segment of universities in each country should accomplish the second academic revolution and develop a base on science and technology in the universities and public labs before embarking on the third role. It is difficult to build an innovation system without building an effective S&T system and it is here that the universities play a significant role.

2) Secondly, basic research is not a luxury in Africa but an essential factor of S&T development and innovation serving industry and society. Building technological capacities in agriculture and health security and creating a base in biological sciences means basic research competencies in tropical climates and health scenarios. For instance, technological capacities in agriculture mean soil science, entomology, plant physiology etc. Without a base in these sciences it is difficult establish competencies in agriculture. Here again universities come to play a significant role in creating a base and advancing science from regional and local climatic perspectives. Aid agencies and MNCs are unlikely to address local and regional issues the way local agencies are tuned to.

3) Thirdly, there is no short cut to development via S&T without public support and government funding. Donor and outside support can only play a subsidiary and complimentary role. This is only if there is a critical investment in GERD by individual African governments.

4) Without creating a science and technology base, which could absorb highly trained scientific and technical manpower, it is bit one sided to talk too much about brain drain in Africa. One
should be more bothered about the S&T African Diaspora in the west. Here again IT networks and the role of government agencies in creating congenial local research ecosystems to absorb the inflow of this critical mass of scientists is very important.

5) Several African countries could learn from the experiences of small countries like Singapore, which was not known for its science but created enviable science and technology based in modern biological sciences.

Comments by Berhanu Abegaz
Berhanu Abegaz framed his comments by focusing on challenges and opportunities for African universities to increase knowledge production. He aimed to address the following key questions:

• What is needed to encourage governments and leaders of research and innovation to translate policy ambitions into focused plans of action?
• How to strengthen knowledge amongst policy makers so that they appreciate the importance of institutional autonomy, thus allowing universities to make a significant contribution to research and innovation?
• How to develop a commitment to the importance of the development of a national research ethics framework when countries develop their research capacities?
• What role can development assistance actors play to support the development and implementation of research and innovation policy at national levels? What are the limitations?

Some Recommendations
For African universities to increase knowledge production, a set of strategies are important:

1. Learning and Teaching Strategy
   • Design and develop courses with contextual relevance to the African situation;
   • Articulate how to attract the best students.

   Such a strategy should enable deliberate efforts to attract specialists in full-time, part-time, and honorary positions. Attracting key personalities that held former key Pan-African positions, giving them tenure-track or honorary positions, and inviting them to come for short working visits as role models plays a positive role in increasing the knowledge production capacity of African universities.

2. Research and Publication Strategy:
   This should focus on:
   • Generating new knowledge from a true geo-cultural space;
   • Addressing strategic areas of African-ness;
   • Developing high-impact factor publications in “African” subject and research areas;
   • Balancing publications in national, regional and international fora of dissemination; and
   • Recognition and distinction through the generation of Africa-specific new knowledge and scholarship.

3. Material Resource Strategy:
   The focus of such a strategy should be on:
   • Acquiring and purchasing materials and resources that focus on Africa: African collections in selected topics;
   • The importance of standardisation, codification, automation and manufacturing of products arising from indigenous knowledge, skills and practices.

4. An Engagement and Innovation Strategy, which shall articulate:
• how to engage local communities, embrace indigenous knowledge, and promote African cultural heritage;
• that any education system should not undermine the indigenous knowledge that has sustained our societies for centuries;
• how to mainstream indigenous knowledge as it can be used for economic development when mainstreamed through the HE and R&D systems.

5. An Internationalisation Strategy:
Such a strategy shall aim to;
• create, enhance and sustain links with African Universities in synergy-seeking relationships;
• enable active and competitive participation in Pan-African associations and institutions;
• host conferences and serve as the seat of Pan-African organisations and institutions, through links with the African Union, NEPAD, etc.;
• Carefully negotiated collaborations with institutions in the North/West.

Responsible Conduct of Research
These include: avoiding research misconduct and following publication practices and responsible authorship; collaboration; peer review; data acquisition, management, sharing and ownership; mentor/trainee responsibilities; conflict of interest and commitment; ethical aspects (human and animal use in research involving humans); and responsible management of research funds.


Some Publication Facts
• 31,279 articles were published between 2004 and 2008
• many of the African institutions that had published a minimum of 30 articles (distribution of those institutions is shown on the map)
• those articles came from 2700 lead institutions in 47 out of the 53 African countries
• the top 20 most productive of those institutions were in South Africa, Egypt and Nigeria
• of those articles published, 77% were published in collaboration with institutions outside Africa.
• 5.4% of those articles published involved more than one African country.

Map showing the distribution of institutions that had published research outputs, 2004–2008.


Mr. Berhanu also mentioned an initiative to build the World’s Largest Science Infrastructure in Africa, a subject of a public lecture by Bernard Fanaroff, a world renowned astrophysicist and Project Director of the South African SKA project.

**Essential Components of Research Capacity**

Human capacity, tangible assets, organisational skills, and enabling institutions are essential components of research capacity.

<table>
<thead>
<tr>
<th>Human capacity</th>
<th>Tangible assets</th>
<th>Organisational skills</th>
<th>Enabling institutions</th>
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<tbody>
<tr>
<td>Processes for the training, education &amp; professional initiatives in order to increase the levels of knowledge, skills, abilities, values, and social assets of people which will lead to their satisfaction and performance, and eventually improved productivity</td>
<td>Availability of physical facilities, infrastructure, equipment, technology and other assets necessary for research</td>
<td>Coherent mission and mandate, corporate governance and management, research management systems, operational procedures, funding and resources</td>
<td>Political and economic context, institutional relationships, networks, National and Regional research policies</td>
</tr>
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Discussions

Comments

• Yes, mobilising the Diaspora is a good idea; the developed world is financing innovation and the developing world should mobilise human resources, including the Diaspora.

• Internal support and creating research culture are vital for increasing the quality of knowledge production by PhD students.

• Most of our PhD students (for example at Makerere University) came from the government sectors rather than academic and research organisations; those students don’t strive to write good dissertations, because the experiences as well as the incentives for a PhD are not that strong in sectors outside academic and research organisations. Thus, the quality of the PhD depends also on the quality of uptake.

• Supervision of Masters and PhD students is a tough job to focus on:
  o 16% of the academic staff members are Assoc. Profs. and above – UCT
  o 14% of academic staff members are Assoc. Profs. and above – Makerere

• Regarding brain circulation, in some contexts, even brain drain could be okay as our economies cannot absorb all the graduates.

• When producing PhDs, consider if there are opportunities for engaging those graduates.

• In SA there is a massive PhD program; however, there are also cases where a number of academics leave for public sector services. Thus, it is not only the number of PhDs produced that matters most; how we engage those PhDs equally matters.

Questions

1. Concerning challenges and opportunities for African universities to increase knowledge production, how does the AU see the functioning, training and research quality in those universities?

2. In the study of those universities, was it possible to establish a correlation between quality of governance and quality of teaching, research and innovation?
3. Is there an agenda in Africa to mobilise the Diaspora and contain the impacts of the brain drain?

Responses by presenters

• Both good quality and relevance of research are important. In this connection, there was once a discussion about the relevance of space science for Africa vs the funding interests.

• Three universities in South Africa were better in research management, and producing high quality publications; and that was attributable to better quality of governance, better institutional landscapes, and of course reasonable funding.

• In 2011/12 in SA, there were more black PhD students than white PhD students—this is an interesting phenomenon. To sustain such good trends, supervising PhDs and producing competent young PhDs is highly important; and creating job opportunities and promotions for PhD graduates is equally motivating.

• The circulation of academic staff within Africa is very important as it facilitates knowledge transfer. However, western countries such as the US and Canada influence the brain circulation as they have the resources to attract intelligentsia.

• As to systems/agendas of Africa for engaging the Diaspora, each country has a Diaspora engaging Department. As they say, “innovators should not be lost; they have to be traced and kept active.”

SESSION VI: Concluding Session: Key Lessons for Policy and Practice

This concluding session was a panel discussion where four panellists distilled key lessons for policy and practice out of what transpired during the five sessions. The panel discussion centred on the following key questions to be addressed:

• Among the various policy avenues identified during the expert meeting, what are the most promising?

• What issues should be targeted in the coming years?

Moderator: Ms. Åsa Olsson, IHERD Programme Manager, OECD Directorate for Science, Technology and Industry

Panellists: The four panellists were:

• Paschal Mihyo, Executive Director, Organization for Social Science Research in Eastern and Southern Africa (OSSREA);

• Philippe Mawoko, Science and Technology Policy, Human Resource Science and Technology, African Union Commission;

• Lena Johansson de Château, Research Advisor, Research Cooperation Unit, Department for Global Cooperation, Swedish International Development Cooperation Agency (SIDA), Sweden; and

• Benjamin Buclet, Head of Capacity Building Department, Institute for Research and Development, IRD.

Key Lessons for Policy and Practice, Paschal Mihyo

A) Lessons from East Asian Countries

1. Institution Building and Maintaining Institutions: Creating and maintaining institutions is the first most important policy issue. The Asian examples reveal that success in both maintaining the momentum and tempo of research has been more determined by the continuous innovation and institutional renewal of research institutions both in the
government and in the universities. Thus, institution building is very critical. He said this becomes clear when we look at, for example, African countries which have been affected by conflict and compare them with countries in Asia which also experienced conflict.

He said let us, for example, look at Vietnam and Cambodia, which also went through violent conflicts as has been the case with most of the Africa countries in the Great Lakes or Sierra Leone, Liberia, Rwanda, South Sudan, and Uganda. But it did not take long time for universities in Vietnam and Cambodia to emerge out of the conflicts and become strong institutions that are contributing to national development. In addition, Vietnam and Cambodia have moved faster than post-conflict countries in Africa in terms of institution building. This is due to many factors:

- Universities and Research Innovation Systems of Eastern Asian countries have existed for centuries; those in African post-conflict countries are relatively new. In Africa, when guerrillas over-run a university, they bomb it and destroyed it; a case in point is the University of Njala in Sierra Leone; they destroyed the infrastructure for research; the recovery has been very difficult. You remember what Idi-Amin did to Makerere; you remember what other fighters did to universities in their respective countries in East Africa, and in the Great Lakes countries. In Liberia, they took it over and used part of it as their barracks. Today some of the post-conflict universities are still very poorly resourced— the University of Liberia has very few staff; some of the teaching is done by volunteers from UN agencies. University of Juba, Sudan has refused to release some of its assets based in the North; some of its staff have not returned.

- In Vietnam and Cambodia, as conflict went on, the freedom fighters took over universities and Research Innovation Systems as strategic centres; they developed them to use them for acquisition, adaptation, and diffusion of technology not only for facilitating their victory in the conflict; but also as strong players and to preserve development and innovation after the conflict. This is why the universities in those regions have not lost their momentum in research and innovation, and why Vietnam and Cambodia recovered faster than Sierra Leone, Liberia, Rwanda, South Sudan, Uganda and Ethiopia. Therefore, we learn that the economic recovery and overall growth of East Asian countries can also be attributed to institution building, preservation, and development that enabled them to sustain STI and research development.

2) Establishing of Technology Learning Systems: We have learnt from the experiences of India that visionary leadership plays a decisive role in advancing and sustaining STI and overall development. India had visionary leadership since the time of Nehru; and even by the end of the 1950s; they already had a vision of developing a technologically robust economy. TATA also started in the 50s and is now leading the regimes of R&D and has continued investment in technology and innovation. But, benefiting from technological innovation depends on the capacity to acquire, diffuse and domesticate the acquired technologies; capacity to adapt existing technologies to existing circumstances; capacity to absorb sets of knowledge which are applicable to and can help in the innovation process, and of course the capacity to innovate. These depend on learning systems. India and China could be very good examples of more technology learning, which depends on systems established within institutions for technological capacity and learning.

During the 1980s donors had robust programmes on science and technology. The University of Sussex in the UK had intensive courses on science technology policy. Those were the golden days of S&T policy courses. There were big names in science technology capacity development. Beginning the 1990s, there was a paradigm shift. Most donors closed the S&T programmes. Funding for networks such as African Technology Policy Studies (ATPS), the African Centre for

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2 Jawaharlal Nehru (1889–1964) was Indian nationalist leader and statesman who was the first prime minister of independent India (1947–1964). (Microsoft Encarta Premium 2009)
Technology Studies (ACTS), the Centre for Agricultural Mechanisation and Rural Technology (CARMATECH) (Tanzania) was reduced; the people who had been trained were scattered. This did not happen in India. India’s leadership began its IT Vision in the late 1950s. Those with whom some of us were trained used their skills to establish capacity development for S&T policy. Indian Universities and Institutes of Technology, etc established infrastructure such as science parks, technology incubators and research clusters. In the new Millennium, India has emerged as a key player, because they created conditions for the Diaspora to return and created incentives for R&D.

In fact, we still have regional technology learning systems such as the Kenya Agricultural Research Institute (KARI), Kenya Industrial Research and Development Institute (KIRDI), the Kenya Medical Research Institute (KEMRI), CRAT, the International Crops Research Institute for the Semi-Arid-Tropics (ICRISAT), the International Livestock Research Institute (ILRI) (Nairobi), the International Centre of Insect Physiology and Ecology (ICIPE) (Nairobi), the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA). These systems and networks should be owned by the AU.

Among African countries, South Africa has a lot of experience which should help other African countries to see if we can also be players in the emerging economies.

B) Lessons from South Africa

1) University-Industry Links: These have been very strongly established for a long time in South Africa. They learned from the so called ‘public space functions of university’, where they interact with the other sectors; they get grants, donations, attachments, adjunct appointments; they also get purchased courses, like Coca Cola has been buying courses in several universities on their MBA programmes; and a lot of case studies and business studies have been developed in some universities, such as Witswatersrand, and GIBS for a long time.

2) Linkages with knowledge and enterprise: For example, the University of Stellenbosch has a strong culture and history of globally linking with knowledge and enterprise. Ten years ago, they had links with NASA and Aerospace; they operate within the precincts of the wine industry in South Africa and work with the wine producers. They have a long history of links with industry. So, our universities should not continue with an ‘ivory tower’ mentality. They should also link up with knowledge sectors outside their countries.

3) Migration Reform — A Lesson from South Africa and also some other African countries: Martha raised strategies for absorbing and getting the Diaspora back. South Africa has made Migration Reforms allowing dual nationality to the Diaspora. By 2008, the country had about 18 000 experts living in Canada, the UK, the USA, Australia, and New Zealand. These have dual nationality which allows them to return; that is brain gain. Also Ghana, Mali, and Burkina Faso have introduced similar policies, which are essential in facilitating sharing knowledge with the Diaspora. These are good experiences while there are also some African presidents with ill-thought. It was embarrassing when the former President of Kenya went to the USA in 2010 and said to the Diaspora there, “you have abandoned your country; if you want, you can stay there!” This is embarrassing to hear from an African president.

4) Special programmes for Diaspora: We should not expect Diaspora to come back; we should create systems and programmes for them to share their knowledge from where they are. There should be policies to facilitate that. South Africa has a Diaspora Absorption Policy that allowed the University of Stellenbosch and University of Cape Town to have Diaspora Absorption programmes, there is also the LEAP programme in Nigeria. These should be incentive-based programmes to support the Diaspora.

5) Fulbright Fellowships: Another example is using fellowships such as the Fulbright Fellowships. I studied the Fulbright Fellowships between 2000 and 2010, and discovered that South Africa, Namibia and Ethiopia were leading in using the Fulbright Fellowships. About
60% of the Fellows were in Natural Scientists; 60% were Diaspora scholars; about 50% had visited more than twice. Thus, developing more Diaspora-friendly policies is central. Those who come more than once can be tapped and be given temporary positions or zero professorship so that they keep coming.

What Issues should be Targeted/Taken?

1. **Leadership awareness/conscientisation**: There is no problem of political will with our leaders; they have the commitment for development, but they lack technical guidance and awareness. We should work in collaboration with parliaments and regional organisations such as the AU, NEPAD, RECs. The major players such as OSSREA, CODESRIA, SANTRUST, FAWE, AAPAM etc. should conscientise our political leaders.

2. **Curriculum review**: knowledge revitalisation, reviving the old networks, reintroducing STI courses from primary to university level is crucial. At the regional level, we still have ICRISAT, ICIPE, ILRI, ASARECA; these systems and networks should be owned by the AU. The AU should support these and make them the engines of technological development.

3. **Redefining the role of universities**: Some have become prolonged kindergartens or youth growth centres. We must have the guts to say when a university is not a university at all.

4. **Making universities strategic partners**: making them part of and not apart from, the engines of development. If we look at PRSPs, there is no mention of universities and research organisations; and again in the second generation policies (so called growth policies), no mention of universities and research organisation as strategic partners.

5. **The Triple Helix concept**: Innovation is a product of a tripod of knowledge: Government, Research Institutes (RIs) and Enterprises (PPP) together forming intellectual communities. This should be pronounced in the national strategies and policies. The involvement of the private sector has not been adequately embraced in policies and strategies, and thus not integrated. We should build a tripod of knowledge based on the major actors— policy actors, policy institutions (which are based in government), and the private sector and productive sectors, and also research institutions working together. We should identify the strategic actors, the change movers, and the change spoilers so that we identify whom to work with.

Aim high; increase PhD capacity, ignore the fear of brain drain, instead produce more PhDs. The brain drain occurs in all nations; not just developing, so more PhDs should be produced so that even if some are taken away as a result of brain circulation there are still enough. This can be exemplified by the export of more coffee from Ethiopia and more groundnuts from Gambia. The production of enough of these crops in these countries has ensured that even when exports increase, there is always enough to go around at home. As the saying goes ‘if you aim high your failure will already be a success’. That should be the spirit.

**Key Lessons for Policy and Practice, Philippe Mawoko**

Mr. Mawoko dealt with the following two major questions:

1. **Policy avenues which emerged during the meeting and worth further exploring**
   1.1. Funding for STI policy activities, in particular those related to innovation, higher education and research for development;
   1.2. Human resources or expertise for innovation and research policy;
   1.3. Organisational capacity;
   1.4. Strengthening executive and political leadership engagement in STI policy development and civil society organisations.

2. **What issues should be targeted in the coming years?**
   2.1. Mobilising and making available existing African and international expertise, we have been saying that there is capacity in Africa to support STI policy activities; networking that capacity is what is important.
2.2. Establishing/strengthening a regional "platform" for STI policy training supported by a virtual resource (data, statistics) centre; we should think of establishing a regional repository.

2.3. Develop a guide for policy-makers to innovation concepts and innovation policy formulation.

2.4. AOSTI is doing work on the above.

Mr. Mawoko identified four areas of policy avenues that emerged during the meeting and are worth exploring further.

**Funding STI Policy Activities:** the impact of this requires a long-term commitment as the beneficial contribution of knowledge is indirect; thus, sustaining the funding commitment appears important.

Many African countries do not have budgets dedicated to STI policy activities, particularly for research or evidence gathering. Some rely on short-term project funding that is linked to events such as workshops and consultancies to review R&D the systems or to collect STI indicators for UNESCO and NEPAD.

Important aspects of STI policy development such as monitoring and evaluation are not budgeted for and are thus not resourced in most countries. The bottom line is funding.

**Human Resources or Expertise for Innovation and Research Policy**

- Most ministries of, and/or departments responsible for, STI policy-making are not staffed with persons with relevant research and analytical skills. Many of the officials involved in or required to be in charge of drafting policy documents are not really versed with or trained in STI policy and have no experience in evidence based policy making.
- On the whole, expertise in STI policy development is in short supply in most African countries.

**Organisational Capacity**

- Many African countries have created departments and ministries for STI policy activities. Some (for example Kenya and Uganda) also have councils or commissions for science and technology in addition to the ministries.
- Are these institutions appropriately located in the executive structure of policy making?
- Many African countries’ ministries and departments responsible for STI policy tend to operate in isolation from other government policy agencies and have weak links to academic institutions and the private sector.
- They are also not adequately linked internationally or to the few African think tanks in policy research. As such they are not easily able to access empirical material and ideas for STI policy making.

**Improve Overall Conditions or Contexts for STI-policy Development**

- Strengthening executive and political leadership engagement in STI policy as well as civil society organisation.
- National Presidents and/or Prime Ministers need to play a more active leadership role in promoting STI and the formulation of relevant policies; example of Rwanda in ICT.
- The South Africa example of the involvements of the Minister to seek support for STI project.
- Parliamentary Committees on STI need to be strengthened to allow active engagement in STI policy activities. In most of the countries these committees do not have research capacity or support for policy analysis, lack specific programmes and tend to work on an ad hoc basis; they do not have dedicated budgets, and many of their members do not have adequate understanding of the wide range of STI policy issues that the committees are expected to handle.
- Civil society organisations and think tanks for STI policy are nascent, almost non-existent in most African countries. Although there are civil society organisations (CSOs) focusing on sectoral STI policy issues such as bio-safety, climate change, biodiversity and other aspects
of environmental regulation, these institutions do not focus and/or participate in the development of overall national STI policy regimes in the countries.

What issues should be targeted in the coming years?

(a) Mobilising and making available existing African and international expertise to support STI policy activities in Africa

• Many departments and/or ministries of STI do not have access to information on the available STI policy expertise in the continent and abroad. AOSTI can be instrumental in supporting African governments and the existing STI policy expertise by making information on experts available through an organised database.

(b) Establish a coalition/consortium for STI policy training

• The assessment shows that there is a variety of STI policy training courses. Some of the courses are tailored for government officials in departments or ministries of S&T. The UNU-MERIT DEIP course is tailored to specific country’s needs. It has been offered to Ethiopia, Senegal and Nigeria. The new UNESCO-SADCSTI policy course focuses on S&T policy reviews and R&D indicators.

• Establishing a platform or consortium that brings together the d/t institutions offering courses to design and implement one comprehensive programme for STI policy training.

(c) Develop a virtual resource centre or unit on STI policy information

• Almost all of the countries that participated in the survey or assessment exercise identified provision of STI policy information (with an emphasis on STI data and statistics and on concepts and systems of innovation) as needed with a priority in capacity building. All identified this as one area where AOSTI can play an important role in supporting their access to information and literature relevant to STI policy formulation and implementation in Africa. AOSTI should consider establishing a well-structured policy makers’ web- based STI policy library. This would be a virtual centre or unit that is tailor made to suit information needs of African policy makers.

• AOSTI should design and manage a web-based database of experts in STI policy. The data base should contain information on the individual experts’ education background, research outputs and experience in STI policy research and participation in national policy processes.

(d) Develop a policy-makers’ guide to innovation concepts and innovation policy formulation

• The concepts of innovation, systems of innovation systems, and innovation policy are not well understood by most policy-makers and thus current efforts at STI policy formulation seem to lack clear conceptual clarity. AOSTI should consider developing an accessible African policy makers’ guide (with example of practices drawn from other parts of the world) on definitions and application of innovation concepts as well as guidelines for innovation policy formulation, implementation, monitoring and evaluation.

• Many countries are engaged in various activities to design modern STI policy regimes. However, most of the countries do not have the necessary capacities for STI policy formulation. The study recommends that AOSTI should incorporate STI policy capacity building with an emphasis on mobilising existing expertise, developing STI training programmes that explicitly focus on innovation policy, and establish an information centre on STI.
As a Sida representative, I will provide some summary reflections on the presentations and discussions from a donor perspective, including promising policy avenues and issues to be targeted in the coming years.

- **Contextualising Higher Education and Research in Society:** Our ability as donors, to contextualise support is crucial to achieving sustainable development. In order to strengthen higher education and build research capacity and, ultimately, promote development and fight poverty, it is fundamental that we donors understand the [societal] context of the higher education, research and innovation system. This means [having an] overall understanding of the national and regional political and economic context, as well as the social and cultural context in which the higher education, research and innovation system works. Contextualising is a constant challenge, as the context is constantly changing. We also need to deal with the various timelines of the higher education and research system on the one hand, and the political system on the other. Hence, contextualising implies accommodating the long-term horizon of higher education and research (academic capacity building, take-up of research results, impact of research in society), with the often short term horizon of politics (governmental policy periods, election cycles).

  How can we contextualise support? How can donors gain contextual understanding? Two ways: 1) through systematic analysis and knowledge production, such as the studies produced by the IHERD programme. 2) Through dialogue with people like you – representatives our partners and stakeholders in higher, research and innovation [in Africa]. Where these two ways merge, as has happened in this meeting, in joint discussion of advanced, high quality result studies, we are able not only to move the knowledge frontier forward and create shared understanding, but also build joint capacity for coordinated effort and impact to make change for development. As has been said during this meeting, a next important step would be to invite other sectors of society to this discussion, such as the private sector and civil society. For example, to strengthen the linkage between university and the private sector [a need mentioned by several meeting participants].

- **A Holistic Approach to the Higher Education, Research and Innovation System for Development:** At another systemic level, we donors need to have a holistic understanding of the higher, research and innovation system. The interdependencies within the higher education and research system are strong and obvious. For example, the need for high quality, research-related higher education (undergraduate and masters), research-based teacher training, the recruitment of qualified students to PhD programmes, the provision of qualified supervisors in PhD programmes. So, how can we donors improve our effort to support the higher education, research and innovation system in Africa? Firstly, studies like those provided by the IHERD programme are invaluable sources as surveys and a point of departure for discussion. Secondly continual dialogue with our partners and other players in the HE, research and innovation system is crucial. Thirdly, donor coordination and the integration of operations between contributions to HE, research and innovation – the whole system chain – is important. A lesson for Sida, is that we need to find methods and ways of working for a higher degree of integration between operations in HE, research and innovation for development.

- **The Complexity of the Research Funding Landscape:** Research is a complex environment. It is important to use the right research funding instruments and modalities for efficient support. Donors need to understand how different funding instruments and modalities work; when and how to use what instrument and what modality, in order to achieve the targets of research cooperation. Instruments and modalities that the funding agency employs must be
sizeable enough and simple enough to administer and be attractive to researchers. Further, research funding instruments and modalities need to be based on national or regional needs and conditions (e.g., national research agenda, national research resource base and HR, funding volume, period of funding, institutional organisation and capacity, individual capacity, research leaders, civil servants and politicians, etc). Trends in public research and innovation funding. The systematic approach to funding, applied in the IHERD-programme, is very useful for Sida when funding research in our partner countries. The IHERD studies help us to think holistically and analyse the expected, and unexpected, effects of our contributions and prioritise our contributions to research cooperation with partners.

- **Doing the Right Thing:** In particular in developing countries, when resources are limited there is a trade-off between different instruments.

- **The Research-Policy Gap:** The research-policy gap has been brought up by several meeting participants. Bridging the research-policy gap is a challenge we share between donor countries and partner countries. As has been put forward during this meeting, engaging political leadership into the development of higher education and research is necessary. It was mentioned that the ambitions of national, political leaders are mostly high, but that in-depth knowledge and understanding of the research sector is often lacking. Hence, coordination and alignment between policy and research on national and regional level needs to improve (strategy, national research agenda in relation to needs and capacity, themes, and funding, student volumes, etc). Up-take of research in development by other policy areas of the country, e.g., agriculture, public health. I am eager to learn more about how you actually engage policy makers in your countries.

- **Relevance vs Quality in Higher Education and Research Funding:** Is there a way to do both? In development, higher education and research funding often means balancing between criteria of relevance and criteria of quality. This meeting has highlighted how criteria of relevance and scientific quality interact, depending on the funding target. The meeting has demonstrated the importance of clear guiding principles, well-defined criteria for application and assessment, as well as a transparent order of priority between these criteria. Based on the meeting discussions, I suggest that this is a potential area of closer dialogue between donors and partners, i.e., the setting of guiding principles in research funding, definitions of relevance and quality criteria in application, assessment and evaluation processes.

- **Ownership and Agreement Are Fundamental for Policies To Work** (leadership, management, policymaking). The meeting has stressed the importance of African countries taking ownership of capacity building efforts. Ownership is particularly crucial when a large share of the funding to higher education and research budgets comes from external sources. National educational and research policies may be developed by external consultants but sometimes lack ‘anchoring’ with relevant implementing parties resulting in no ownership. Sweden’s policy for research cooperation is based on the assumption that ownership is key to sustainable development. This means that the initiative and ownership is with the Sida partners.

- **What Issues should be targeted in the Coming Years?** On the basis of the presentations and meeting discussions, I would like to put forward four main issues to be targeted: PhD training, leadership and management, ethics, interdisciplinary, integrated science.

1) **Research Training:** PhD education needs to be strengthened in the African region. Building quality PhD education takes time. There are various views on how PhD education would best be strengthened. One perspective is based on the notion of academic ‘flag-ship’ institutions ("start where the quality is"). In this perspective, PhD training is best promoted by supporting existing, high quality academic institutions (research universities) in the region, for the flag-ship institutions to take the lead and act as network hubs and institutional mentors for other universities, which need further strengthening. Another perspective is to directly extend and
develop PhD training to a much larger number of university institutions in the region in order to facilitate and strengthen the link between higher education and research on a general, regional level. Supervision is critical to successful PhD training. Today, the number of qualified PhD supervisors is not sufficient to meet the demand of PhD programmes in Africa. Hence, professional training of supervisors is key to strengthening PhD training in Africa. In addition, the meeting has concluded that the design of PhD programs need to be developed, e.g. methodological courses, supervised publishing, etc. Further, master programmes should be training grounds for PhDs. Overall, the relationship between research and higher education needs to be strengthened, promoting continual training of PhD supervisors and strengthening the link from masters to PhD. It is suggested that the academic Diaspora might play a valuable role in building higher education and research capacity, including PhD training in Africa.

2) Academic Leadership and Management: How do we train qualified, all-round academic leaders and managers? Without qualified leaders there is no qualified research or innovation. The meeting has stressed the importance of training for advanced and successful research leadership and management. Managerial skills are needed for innovation. Research leaders are key change agents. Academic leadership and research management is an issue of mutual relevance for OECD and non-OECD countries that should be jointly targeted in the coming years.

3) Ethics: The meeting agenda does not specifically address ethical issues. However, the ethics of higher education, research and innovation policy has been a recurrent theme of several presentations and discussions. An ethical approach to education, research and innovation means bringing in fundamental values such as democracy, human rights, transparency, accountability and gender. For example, what is the role of policy makers, academic institutions and researchers when shaping and implementing educational and research policy to attain and promote overarching societal values (democracy, human rights, transparency, accountability etc)? What are the societal outcomes of governments prioritising applied research in relation to basic research? What does it mean to society when natural sciences are strongly promoted in education and research at the expense of social sciences? The balance between a right-based approach, “higher education for all”, and a quality approach, “safe-guarding high academic quality in higher education”, is another ethical issue that needs to be further targeted.

4) Meeting Global Challenges – The Need for Interdisciplinary and Integrated Science: The integration of all scientific fields, including the humanities and social sciences, is crucial to meet future challenges, locally as well as globally. Tackling global challenges calls for transformative, interdisciplinary efforts and multi-methodological approaches. Along with interdisciplinary and methodological development, the meeting has pointed to social innovation as an issue to be targeted further in the coming years. We need to understand and develop transformative research and innovation processes, how do people function? What are the drives (behavioural, marketing, psychology)? The challenges are about people.

Finally, meetings of this kind are extremely important for Sida in order to develop evidence-based policy and to bridge various gaps (HE, research and innovation; research-policy and between policy makers, or researchers). In the coming months, Sida, together with OECD, OSSREA, CODESRIA, IRD and other partners, will promote the dissemination of the IHERD results to partners and key stakeholders (French speaking African countries, Nordic stakeholders). I welcome future discussions on how we can work together and support higher education, research and innovation for development and look forward to further dialogue on these issues.
Key Lessons for Policy and Practice, Benjamin Buclet, Head of Capacity Building Department, Institute for Research and Development, IRD

1. **Competition Is the Rule:** Yes, competition is positive in many aspects. In this connection, we have been talking of result-based researches and systems, performance-based, centres of excellence. However, concepts such as result-based research and systems, performance-based, centres of excellence, etc. are attractive but difficult to clearly articulate and define. We should operationalise them carefully. Key features that make them motors of change and limit their adverse effects should be neatly articulated. Otherwise, the terms are tricky, and they open a Pandora’s Box for the selection committee to choose some against the others. It may be dangerous to put aside the research applicants that are not selected as decisions are often made based on factors that are far from scientific.

2. **Key Orientation of the Involvement of Governmental HEIs:** Education is a key sector where we build the future of our societies and our countries. With regards to centres of excellence it has been said that the public investment has to be massive; and it reminds me about what the main role of universities is, probably promoting a certain vision, in fact a certain ideological project of a society, and competition sometimes can forget that. Of course there is a market and management of knowledge in countries that are involved in this competition to produce the best knowledge and manage the best way; but sometimes I have a feeling that we forget the primary role of universities, which is to spread universal knowledge, and nothing related to competition.

3. **Link with the Private Sector Is Fundamental:** if we talk about public investment and collective investment in STI, we cannot forget the role of the private sector. However, one key question here is how to reconcile the private sector interests to a national/regional/global project/vision or challenges. Sometimes, challenges are very local.

4. **Scale of Action:** What is the right scale of local, national, regional, and global action? Of course, Mr Jowi’s presentation pointed out internationalisation of HE, which is a good idea. But, it must not lead to the end of diversity; standardisation should not take us to uniformisation of HE.

**Discussion**

- Åsa Olsson indicated that the OECD has been, over the years, working on the links between innovation and industry, research, etc. In many OECD countries governments are not satisfied with the return on investments of research. If the main rationale behind sustaining a high level of investment to research is its ability to produce innovation and economic growth, the risk is that the commitments will decrease over time.

- There are a lot of dimensions of industry-university links. That is in fact natural. But, how many of the Universities have industry linkages in their curricula? Very few. Thus, the need for reforming university curricula is evident, integrate PPP. Otherwise, even the focus on PhD programs could lead to having many useless PhDs. The case of biotechnology and DNA sciences and how the qualities decline through time was mentioned.

  The issue of creating effective STI and links to policy and industry can happen only if we work on policies at the local and national levels. The policy makers, STIs, industry and the private sector need to be integrated. That is, the product development process should form part of the HE curricula.

- We need a holistic approach to check how well a system works; capacity is there but dispersed. Capacity building cannot happen with just short supports of 2 years or so; it requires long-term commitment.

**Kwame Gbesemete:** A lot has been said about reaching HE and STI issues to policy makers so that they institutionalise effective STI policies and strategies. Making some presentation to the
AU Commission and working out a strategy along that line would be important. It is good if OSSREA makes a presentation to the AU.

- Building a community of researchers and striving to institute effective linkages is what we should advocate for. It is lacking in Sweden and many African countries. There are countries and cases where the dialogue for linkages has started.
- To reach the Heads of States, working with the Parliaments would be a good entry point. OSSREA tried that with the East Africa Community and African Youths’ Parliament, and the experience was a promising one. The system approach could enable us to analyse the various actors’ involved in our system and work out linkage strategies.

Ása Olsson: Ownership of HE and STI funding by Africans is of course one of the great ideas that transpired from the meeting, which turned out a success. There will be a similar event in Senegal for Francophone Africa. Resource mobilisation is one of our forthcoming activities.

Ebrima Sall: Preliminary findings from CODESRIA include quality of teaching; social engagement; governance reform processes increase in knowledge production; and strategies for developed countries to keep.

Mr. Mawoko emphasised the vitality of:

- **Funding for grant research**: budget lines for STI and short-term policy for the development of education;
- **Human resource/expertise for innovation**: staffing, skills, policy development capacity,
- **Organisational capacity**: location of ministries in the executive structure; isolation; linkages with TTS
- **Executive and political leadership**: engagement in policy development; champions being well-informed; parliamentarians are critical.

**What Issues to Target?**
The following points were further emphasised.

- Mobilising existing African and international expertise;
- Establishing platforms for STI policy training, supported by a resource centre; design and innovation policy; repository of research materials is missing and needs to be installed;
- Developing a policy-makers guide to policy making and innovation, including a repository of concepts to measure or number innovation;
- Diversifying precious resources to citizens to be utilised by new actors;
- Holistic understanding of HE and research at large by donors;
- In order to strengthen HE and research, there is need to understand smart ways of working; take into consideration trends and contexts in Africa which are also constantly changing;
- Evaluation and impact analysis of research. Donors can:
  1. organise systematic analysis and scientific knowledge, e.g. the type OECD produces.
  2. dialogue with stakeholders to push the frontiers of knowledge.
- In fact the dialogue should bring in other sectors of society.
- HE, research and innovation: donors need more knowledge of inter-linkages between the three.
- Scarce resources call donors to do the right thing; Sida should always be integrated.
- Research funding: choosing the right instruments and modalities; understanding what instruments exist and what works.
- Need for informed decisions.
- Research-policy gap is big in Africa, it is important to work with policy-makers.
- Engage political leadership; promote uptake of research results.
• Dialogue and coordination between policy and research.
• Relevance vs. quality: is it possible to do both? The challenges remain but solutions are possible.
• Ownership and engagement: Sida as a donor promotes ownership of research by Africans. Sometimes, it is difficult, but it is important.
• Competition: result-based management; excellence etc are important; but sometimes decisions are made from positions that do not meet standards of excellence. Therefore, it is dangerous to leave out those who are not selected.
• Centres of excellence: public investments are to be robust. But there are many factors; sometimes we also forget the primary roles of universities i.e. not competition.
• Actors: private actors should not be left out; let us see how we can reconcile private and public interest.
• Scale of action: what is the best scale; e.g. internationalisation is okay; but if the cost is standardisation of knowledge, it will be a pity.
• The three revolutions in:
  a. Teaching: include all levels based on innovative modalities;
  b. Research: innovate, there is need for more than research; capacity development is crucial; but we need strategies;
  c. Innovation: aim high and aim also for efficiency;
• In South Africa, there is a programme for linking universities and industry run by NRF, aimed at building capacity for managing projects and procurement because long-term support is crucial for sustainability of programs.
• The tripod: how do we bring the parties together; there is disconnect between institutions.
  When we think of linking research and innovation, in many of our countries, the industries are not there.
• PhDs for a critical mass or for a purpose.
• Reaching the leaders through the AU.
• Researchers should think beyond publications.
• Uganda: Industrial Research Institute- incubation is the goal, but take-up is a problem.
• Academic research on HE, research and innovation is divided into, quality assurance, research and linkages; dialogue is vital.

Tweets @ https://twitter.com/OECD_innovation

In addition to what transpired at the meeting, some also tweeted the following:
• Knowledge and skills of policy makers must be strengthened for adopting evidence-based R&I policy.
• Capacity building in research and higher education is crucial to all other sectors in society
• Research funders are becoming increasingly trans-national, making opportunities for researchers in developing countries.
• Increased pressure on universities to pursue research agendas should be anchored in the needs of society.
• Integration between higher education, R&I remains a missing link for policy practice.
• Low-income countries should take ownership of capacity building efforts in R&I.
• Universities are better at indirect, long-term knowledge building than direct, short-term application.
• We must strengthen knowledge and skills of policy makers for adopting evidence-based R&I policy.

Closing
Annexes

Annex I. Participants List for CSO/IHERD Expert Meeting

Participants List for CSO/IHERD: Implementing research and innovation policy at policy and institutional levels in Africa
Liste des Participants pour CSO/IHERD: Implementing research and innovation policy at policy and institutional levels in Africa
Addis Ababa, Ethiopia
19/9/2013 - 20/9/2013

<table>
<thead>
<tr>
<th>Name</th>
<th>Position/Department</th>
<th>Organization/Location</th>
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<tbody>
<tr>
<td>Mr. Hassen ABEAW</td>
<td>Director of Finance and Administration</td>
<td>OSSREA</td>
</tr>
<tr>
<td>Professor Berhanu ABEGAZ</td>
<td>Executive Director</td>
<td>The African Academy of Sciences (AAS)</td>
</tr>
<tr>
<td>Dr. Nicholas AWORTWI</td>
<td>Director of Research</td>
<td>PASGR, Kenya</td>
</tr>
<tr>
<td>Professor Krish BHARUTH-RAM</td>
<td>SCience and TEnology</td>
<td>NACI, South Africa/Afrique du Sud</td>
</tr>
<tr>
<td>M. Benjamin BUCLET</td>
<td>Head of Capacity Building Department</td>
<td>IRD – Direction des Programmes de recherche et de la Formation au Sud</td>
</tr>
<tr>
<td>Jonas CHAMBULE</td>
<td>Head Health Programme</td>
<td>Irish Aid Embassy in Maputo</td>
</tr>
<tr>
<td>Paulos CHANIE</td>
<td>Director of Research</td>
<td>Organization for Social Science Research in Eastern and Southern Africa (OSSREA)</td>
</tr>
<tr>
<td>Nico CLOETE</td>
<td>Director</td>
<td>Centre for Higher Education Transformation, South Africa/Afrique du Sud</td>
</tr>
</tbody>
</table>
Ms. Natalie Cooke  Consultant  
STI/CSO  
OECD/OCDE

Dr. Abiyé Daniel  Director of Publications and Dissemination  
Organization for Social Science Research in Eastern and Southern Africa (OSSREA)  
Ethiopia/Éthiopie

Dr. Martha K. Ferede  Other/Autre

Mr. Kwame Gbesemete  First Secretary  
Regional Research Cooperation  
Embassy of Sweden  
Sweden/Suède

Dr. Melese Getu  Research Associate  
OSSREA

Monica Idinoba  African Union Commission

Dr. Lena Johansson de Chateau  Research advisor  
Department for Global Cooperation, Research Cooperation Unit  
Swedish International Development Co-operation Agency (SIDA)  
Sweden/Suède

Mr. James Otieno Jowi  Coordinator  
African Network for Internationalization of Education (ANIE)

Professor Eli Katunguka  Professor and Director of Research  
Makerere University  
Uganda/Ouganda

Misrak Kinfe Michael  Research and Training Assistant  
OSSREA

Mr. Venni Venkata Krishna  Professor of Science Policy  
Jawaharlal Nehru University  
Centre for Studies in Science Policy, School of Social Sciences  
India/Inde

Mr. Richard Lutalo  Senior Science Officer  
STI Policy and Coordination  
Uganda National Council for Science and Technology

Ms. Alma Maldonado-Maldonado  Researcher  
Educational Research Department
Mr. Mothusi MASOLE  
*Institutional Funding*
*Tertiary Education Council in Botswana*
*Botswana*

Paschal B. MIHYO  
*Executive Director*

Callistus OGOL  
*Focal officer*
*Pan African University*

*African Union Commission (AUC)/Commission de l’Union africaine (AUC)*

Miss Sophie O’GORMAN  
*Assistant*
*STI/CSO*

Ms. Asa OLSSON  
*Policy Analyst (Innovation, development)*
*STI/CSO*

Dr. Anshu PADAYACHEE  
*Santrust*

Mme Elodie PIERRE  
*Events Co-ordinator*
*STI/COM*

Dr. Katri POHJOLAINEN YAP  
*Senior Research Advisor*
*First Secretary*
*Swedish Embassy*
*Sweden/Suède*

Ebrima SALL  
*Chief Executive*
*CODESRIA*
*Other/Autre*

Shaun STUART  
*Research Africa*

Mr. Matebu TADESSE  
*Publications/Programme Assistant*

OSSREA

Mr. Alemu TESFAYE  
*ICT Specialist*

OSSREA

Dr. Bi Irie VROH  
*STI Senior Expert: S&T Programme*

*The African Observatory for STI (AOSTI)*
Ms. Charmaine WILLIAMSON  Academic Programmes
SANTRUST

Mr. Johannes WOLDETENSAE  Focal Officer
Quality in Higher Education
African Union Commission (AUC)/Commission de l’Union africaine (AUC)

Benigna Jesus ZIMBA  Professor
Eduardo Mondlane University
Opening Session

Paulos Chanie, Research Director, Organization of Social Science Research in Eastern and Southern Africa (OSSREA)

Paulos Chanie has a PhD in Development Studies (2007) from the International Institute of Social Studies, Erasmus University, The Hague, Netherlands. During his career life, he has been teaching in Addis Ababa University, doing research and consulting local and international organisations in the areas of public policy and administration, development management, decentralisation and civil service reform. He has published in the areas of public service reform and management, ethnic politics, neopatrimonialism, and fiscal federalism. He is currently an Assistant Professor at Addis Ababa University and Director of Research at the Organisation for Social Science research in Eastern and Southern Africa (OSSREA).

Åsa Olsson, Administrator, Country Study and Outlook Division, Directorate of Science, Technology and Industry, OECD

Åsa Olsson, with a PhD, is Program Manager for the Program on Innovation, Higher Education and Research for Development (IHERD) at the OECD since May 2011. Prior to this (2009-2011), Ms. Olsson was a research advisor to the Swedish International Development Cooperation Agency (Sida); her portfolio included research communication and research and innovation policy. Ms. Olsson worked at UNESCO from 2005 to 2009, coordinating the UNESCO Forum on Higher Education, Research and Knowledge (HERK).

Paschal Mihyo, Executive Director, Organization for Social Science Research in Eastern and Southern Africa (OSSREA)

Paschal Mihyo is a Tanzanian, a lawyer by profession, a Professor of Politics and Administrative Studies with LL.B., LL.M and a Ph.D. in Public Law from the University of Dar Es Salaam. He is currently Executive Director of the Organization for Social Science Research in Eastern and Southern Africa (OSSREA). Between 1975 and 1988 he taught in the Faculty of Law University of Dar Es Salaam. Between 1988 and 2004 he taught at the International Institute of Social Studies, Graduate School of Development Studies at Erasmus University in The Hague, where he was also Dean of Studies 1992–1995. From April 2004 to September 2005, he was Director of Research and Programs at the Association of African Universities in Accra after which he joined the University of Namibia briefly and moved to Addis Ababa to join OSSREA in June 2008. He has published six books and 43 journal articles on law, human rights and politics in Africa. He is currently working on a book on Regional Integration in Africa and another one on 30 Years of Public Sector Reforms in Eastern and Southern Africa. Both books are expected to be published by the end of 2011.

Lena Johansson de Château, Research Advisor, Research Cooperation Unit, Department for Global Cooperation, Swedish International Development Cooperation Agency (SIDA), Sweden

Lena Johansson de Château is research advisor at Global Cooperation, Swedish International Development Cooperation Agency (Sida). Her professional expertise is in the area of research funding, international research cooperation, knowledge management and research policy analysis. Before joining Sida, Johansson de Chateau was Director of Research at the Swedish International Centre for Local Democracy (ICLD). Previous staff member of Swedish Research Council, Lena managed the Swedish Research Links programme, a Sida-supported programme for research cooperation
between Sweden and partner countries in Africa, Asia and the MENA-region. In various capacities, she has engaged in Sweden’s work with UNESCO’s scientific programmes. Her research focuses on land use and water management in colonial/post-colonial North Africa. She was Fulbright visiting scholar at Harvard University, Centre for Middle Eastern Studies, research fellow at the Swedish Institute for Classical Studies in Rome and is member of the Swedish Research Institute in Istanbul. Lena holds a PhD in Classical Archaeology and Ancient History and a BSc in International Business Administration, both from Uppsala University, Sweden.

### Session I: Trends in research and innovation policy and implications for Africa Trends

**Jonathan Chuks Mba, Research and Academic Planning, Association of African Universities**

Jonathan Chuks Mba holds a PhD in Population Studies from the Regional Institute for Population Studies at the University of Ghana. Prior to joining the MRCI, Dr. Mba also worked at the Institute for over a decade. He has been involved with a variety of research projects on such topics as ageing, maternal and child health, adolescent reproductive behaviour, and HIV/AIDS. As well as consulting for various international organizations, he has published extensively in journals and books.

**Åsa Olsson, Administrator, Country study and Outlook Division, Directorate of Science, Technology and Industry, OECD** (for details, refer the previous page)

**Natalie Cooke, Consultant, Country study and Outlook Division, Directorate of Science, Technology and Industry, OECD** (for details, refer the previous page)

Natalie Cooke is a Consultant in the Country Studies and Outlook Division at the OECD. She predominantly works on the Programme on Innovation, Higher Education and Research for Development (IHED), but has also contributed to Innovation Reviews on Southeast Asia, Sweden and Viet Nam. Ms. Cooke previously worked as a Programme Officer in the Volunteers and Business Partnerships Section of the Australian Agency for International Development (AusAID).

**Philippe Mawoko, Science and Technology Policy, Human Resource Science and Technology, African Union Commission**

Dr Mawoko is the Director of the African Observatory for STI within the African Union Commission. Over the last ten years at NEPAD, Dr Mawoko coordinated both the African Science, Technology & Innovation Indicators Initiative (ASTII) and the African Mathematical Institutes Network for the Office of Science and Technology (OST) of the AU-NEPAD Planning & Coordinating Agency (NPCA). Prior to joining OST, Dr Mawoko worked as a Programme Manager in the NEPAD e-Africa Commission. Former Minister of Post and Telecommunications in the Democratic Republic of Congo (DRC), Dr Mawoko led the initial policy reform in the post and telecommunication sector in the DRC.

**Bi Irié Vroh, Senior Expert, Science and Technology Policy, Human Resource Science and Technology, African Union Commission**

Dr Vroh is Senior Expert, Science and Technology Policy at the African Observatory for STI (AOSTI). Prior to joining AOSTI, Dr Vroh was Breeder and head of a research for development program for West and Central Africa at the International Institute of Tropical Agriculture (IITA). Holder of a PhD (1999) in Agronomic Sciences and Bio-engineering from the University of Liege, Belgium (Gembloux Agro-Bio Tech), he worked as a Molecular Geneticist and Project
Lead in the USA at the University of Illinois Urbana-Champaign, University of Missouri Columbia and Cornell University in the area of biotechnology, genomics, genetic diversity and genetic improvement of crop species. In his current position of Senior Expert, Science and Technology Policy at the African Observatory for STI (AOSTI) of the African Union, Vroh is in charge of the Science and Technology Policy program and conducts several capacity building activities throughout Africa in relation to STI indicators and policy instruments.

Eli Katunguka, Professor and Director of Research, Makerere University, Uganda

Eli Katunguka Rwakishaya has tremendous administrative experience in higher education having been Head of Veterinary Medicine department and Associate Dean (1992-1996), Dean of the Faculty of Veterinary Medicine (1996-2004), Director of the School of Graduate Studies (now Directorate of Research and Graduate Training) 2005-to date).

As Director of Research and Graduate Training, he has attracted large sums of money to support research at Makerere University. Notable development partners are Swedish International Development Agency (52 million dollars, 2005-2014), Carnegie Corporation of New York (3.5 million dollars), European Union (1 million dollars), Welcome Trust (2.5 million pounds) and more. With this funding, more than 250 staff members have been trained to Doctorate levels, 100 to Masters and 100 to postdoctoral levels. In addition, this money has benefitted more than 1000 academic staff in research skills enhancement courses.

He served as a member of the Aquatic Animal Health Standards Commission for six years (2004-2009) and is currently assisting the commission as an independent expert. He has represented the World Animal Health Organisation (OIE) in many Africa regional conferences and contributed to development of Aquaculture bio-security framework for Africa. Currently he is a Professor of Veterinary Medicine and Director of Research and Graduate Training at Makerere University.

Session II: Research funding instruments and modalities

Benjamin Buclet, Head of Capacity Building Department, the Institute for Research and Development (IRD), Marseille

Benjamin Buclet holds a PhD in Socio-Economic Development from the Ecole des Hautes Etudes en Sciences Sociales, Paris. He pursued his thesis research as an assistant researcher at Museu Emilio Goeldi in Belém, Brazil and the Federal University of Rio de Janeiro (UFRJ), focusing on the international aid industry, non-governmental organizations and local governance in the Amazon. He continued his research as post-doctoral fellow at URFJ, while working as independent consultant to international development agencies, universities and research centres. In 2008, he joined IRD where he oversees capacity building programs, works on innovative processes to transfer capacities in the context of international cooperation and researches governance of innovation and higher education systems.

Åsa Olsson, Administrator, Country study and Outlook Division, Directorate of Science, Technology and Industry, OECD (for details see the second previous page)

Venni Venkata Krishna, Centre for Studies in Science Policy, School of Social Sciences, Jawaharlal Nehru University, New Delhi (for details see the second previous page)

Dr Venni V Krishna is Professor in science policy and Chair, Centre for Studies in Science Policy, School of Social Sciences at the Jawaharlal Nehru University, New Delhi. He has 40 research papers and five books. He is the founder-editor and currently Editor-in-Chief of an international journal Science, Technology and Society, published through Sage Publications. He is consultant to European Union and Indian correspondent for EU on research
and innovation policies for ERAWATCH and Inno-Trend Policy networks. He has visiting positions at the University of New South Wales, Sydney. He Visiting Professor at the Institute of Advanced Study, United Nations University, Yokahama, Japan.

**Krish Bharuth-Ram, University of KwaZulu-Natal, South Africa**

Krish Bharuth-Ram was appointed as the Head of National Advisory Council on Innovation in June 2010. Some of the positions he has held include Head of Department of the School of Physics and Dean of the Science Faculty at the former University of Durban-Westville, Director of iThemba LABS and Executive Director/Interim Vice President: Research Infrastructure and National Facilities at the National Research Foundation, and Chair of the Board of Directors of the National Nuclear Regulator.

**Ebrima Sall, Executive Secretary, Council for the Development of Social Science Research in Africa (CODESRIA)**

Before his appointment as Executive Secretary of CODESRIA in April 2009, Dr. Sall was Senior Researcher at the Nordic Africa Institute (NAI) in Uppsala (Sweden) and Director of the Centre for the Promotion of Village Savings and Credit Associations (VISAC) Gambia. He also taught at the University Gaston Berger of Saint-Louis (UGB) in Senegal for five years. He holds a Ph.D. in sociology from the University of Paris 1 Panthéon-Sorbonne (France), was promoted 'Maitre de Conférences/Senior lecturer in "Sociology-Demography" by the French National Universities Council (CNU) in 1992. He is also a beneficiary of the post-doctoral fellowship of the Yale University Programme in Agrarian Studies. Before assuming the duties of Executive Secretary Dr. Sall, successively, was the Programmes Officer in charge of the Academic Freedom and Child & Youth & Conflict Programme, Senior Programme Administrator, Research Programme Officer and Head of Research Programme.

**Session III: Leadership and management of research at institutional level**

**Alma Maldonado, Educational Research Department, Centre for Advance Research**

Alma Maldonado-Maldonado is a researcher at the Educational Research Department of the Centre for Advanced Research of [Centro de Investigaciones Avanzadas]. Previously, she was an assistant professor at the University of Arizona’s Centre for the Study of Higher Education in the U.S. Maldonado was born in Mexico City and obtained her undergraduate education at the National Autonomous University of Mexico (UNAM). Later, Alma earned her doctorate at the Boston College’s Centre for International Higher Education in the U.S. Her research focuses on comparative higher education, international organizations, higher education policy and research in Latin America and particularly on Mexico and issues regarding globalization, mobility and internationalization of higher education (institutions, faculty and students). Maldonado-Maldonado is co-editor of four books: *Private higher education: An international bibliography*; *Educación superior latinoamericana y organismos internacionales. Un análisis crítico* [Latin American higher education and international organizations. A critical analysis]; *International Organization and Higher Education Policy. Thinking globally, acting locally?* published by Routledge with Roberta M. Bassett in 2009; and the most recent (2013) *The forefront of Internacional Higher Education: A Festschrift in Honour of Philip G. Altbach* (in the Springer series Higher Education Dynamics), co-edited with Roberta M. Bassett. Maldonado-Maldonado also has published in different journals and writing several book chapters in different countries.

**James Otieno Jowi, Executive Director, African Network for Internationalization of Education (ANIE), Kenya**

James Otieno Jowi is the founding Executive Director and Secretary General of the African Network for Internationalisation of Education (ANIE). He also teaches Comparative and International Education at the School of Education, Moi University, Kenya. He has published on Internationalisation of Higher Education, especially in Africa and has also presented conference papers on
the same. His other research interests are in governance, management and leadership in higher education. He was member of the IAU Task Force on the Third Global Survey on Internationalisation of Higher Education. He is also a member of the IAU Ad-hoc Expert Group on Rethinking Internationalisation. He holds a Bachelor of Education and Masters in Linguistics from Moi University (Kenya), a Masters in Comparative and International Education from University of Oslo, Norway and is finalizing doctoral studies in Higher Education Studies at CHEPS, University of Twente, Netherlands.

Benigna Jesus Zimba, Eduardo Mondlane University, Mozambique

Benigna Zimba has a PhD in History of Africa from the University of Michigan-Ann Arbor. She currently is an associate professor at Eduardo Mondlane University, Mozambique. Between October 2012 and June 2013, she was Deputy Coordinator and Acting Coordinator of the Interim Rectorate in charge of the instalment of the Pan African University, African Union, Addis Ababa, Ethiopia. From 2007 to 2009, she was Scientific Director of the Institute of International relations, Maputo. From 2002 to 2007, she was Head of the History Department, Eduardo Mondlane University, Maputo.

Nico Cloete, Director, Centre for Higher Education for Transformation, CHET, Cape Town

Dr. Nico Cloete has been the full-time director of CHET since 1997. He is also Extraordinary Professor of Higher Education, University of Western Cape; Visiting Professor, Masters Programme in Higher Education, University of Oslo and Honorary Research Fellow, University of Cape Town. He was actively involved in academic staff organisation and was President of the University of Witwatersrand Staff Association (1991-1992) and General Secretary of the Union of Democratic University Staff Associations of South Africa (1993-1994). He was the research director for the Nelson Mandela appointed National Commission on Higher Education (1995-1996) and served on the South African Ministerial Advisory Council for Universities and Technikons. Dr. Cloete initiated the Higher Education Research and Advocacy Network in Africa (HERANA) in 2009 and is the co-ordinator of this network. In 2010 he gave the opening keynote at the congress of the European Consortium of Higher Education Researchers in Oslo. He has published widely in psychology, sociology and higher education policy.

Session IV: African Union Initiatives

Philippe Mawoko, Science and Technology Policy, Human Resource Science and Technology, African Union Commission (details on the previous pages)

Anshu Padayachee, CEO of SANPAD/SANTRUST

Anshu Padayachee is the CEO of SANPAD/SANTRUST. She was previously the Deputy Vice-Chancellor (Academic) and Special Advisor (mergers and transformation) to the Vice-Chancellor of DUT. She co-founded the first NGO dealing with Domestic Violence in South Africa. She obtained her Master’s degree cum laude and she was the first black PhD in Criminology in South Africa. She has a certificate in Higher Education Management from Harvard University. She initiated and developed the SANPAD PhD capacity building initiative. She is the recipient of several academic and community awards.

Charmaine Williamson, Programme Manager, Santrust

Charmaine Williamson has been a teacher as well as a lecturer and supervisor in the fields of Human Resources, Strategy and Developmental Project Management. She was the Manager of International Relations and Donor Strategies in the legislative sector. Later she served as the Director of the Conflict and Governance Facility, a grant project under National Treasury that specialised in research grant management and research capacity development. Charmaine has worked on diverse areas such as gender, conflict and governance, official development
assistance project strategies and skills development. Charmaine has also consulted to various Government Departments, Universities and NGO's and currently supports Santrust’s vision of ‘Thinking Africa’ in her role as the Academic Programme Manager for Africa and International Programmes.

**Callistus Ogol**, Focal Officer for Pan African University, African Union

Callistus Ogol has a PhD in Entomology from the University of Alberta, Edmonton, Alberta, Canada. During his career life, he has been teaching in the areas of general and applied entomology, general and applied ecology, biostatistics and research methodology, biodiversity, environmental biology. He has been undertaking research in the areas of integrated pest management, biological control, pest impact and dynamics in agro forestry systems, biodiversity and natural resource utilization, insect pests and natural enemies’ population dynamics, food security analysis, behavioural and prevalence research on HIV and AIDS. His current research focuses on the indigenous knowledge of medicinal plant use and conservation in Samburu.

**Monica Idinoba**, Focal Officer for STI programmes, African Union

Monica Idinoba is a Research Associate/Research Fellow with the International Institute of Tropical Agriculture (IITA) Ibadan, Nigeria, as well as a Visiting Research Fellow in Systems analysis unit of the West Africa Rice Development Association, Côte d’Ivoire. Her areas of expertise covers climate variability, change and implication for agriculture in West Africa, contribution of agricultural activities to global change, working and living conditions of women in agriculture.

### Session V: Challenges and Opportunities for African Universities to Increase Knowledge Production

**Paulos Chanie**, Director, Organization of Social Science Research in Eastern and Southern Africa (OSSREA) (Details on the previous pages)

**Nico Cloete**, Director, Centre for Higher Education for Transformation, CHET, Cape Town (Details on the previous pages)

**Martha K. Ferede**, Presidential Scholar, Higher Education Policy, Harvard University

Martha Kateri Ferede holds a PhD in Higher Education Policy from Harvard Graduate School of Education (2013). Her research experience comprises a project on "The Faculty Hire Pipeline (large-scale quantitative study)" at Harvard University Vice-Provost Office of Faculty Development and Diversity (2008–2012), and a project titled “The Story Book Project, a literacy tool to engage underserved immigrant families in schools (small-scale pilot study)” at Harvard Family Research Project (2005–2006).

**Venni Venkata Krishna**, Centre for Studies in Science Policy, School of Social Sciences, Jawharlal Nehru University, New Delhi (Details on the previous pages)

**Berhanu Abegaz**, Executive Director, African Academy of Sciences

Berhanu Abegaz is Executive Director of the African Academy of Sciences, Nairobi, Kenya. His research and publication efforts are based on a wide range of activities: from physical organic chemistry, synthetic chemistry, phytochemistry to higher education and policy aspects. We have also investigated plants with nutritional (grass pea – *Lathyrus sativus*), medicinal (against parasites such as malaria, and against bacteria, especially, the TB causing microbe *Mycobacterium tuberculosis*) as well as those with flavour and fragrance properties.

### Concluding Session: Key lessons for policy and practice

**Åsa Olsson**, Administrator, Country study and Outlook Division, Directorate of Science, Technology and Industry, OECD (See previous pages for a detailed bio of her).

**Paschal Mihyo**, Executive Director, Organization for Social Science Research in Eastern and Southern Africa (OSSREA) (See previous pages for a detailed bio of him).

Lena Johansson de Château, Research Advisor, Research Cooperation Unit, Department for Global Cooperation, Swedish International Development Cooperation Agency (SIDA), Sweden

Benjamin Buclet, Head of Capacity Building Department, the Institute for Research and Development (IRD), Marseille (See previous pages for a detailed bio of him.)
Annex III. Agenda


Rationale and objective
Many African countries have established research and innovation policies and strategies for integrating higher education and research into macroeconomic policies to stimulate technological renewal. In addition to this national focus, the African Union is increasingly involved in stimulating development of research and innovation capacities through supporting various initiatives including the Pan-African University.

The governance of public Research & Innovation (R&I) is a difficult task because while research financing remains for the most part national, research is being conducted within increasingly transnational and global networks. This trend is important for African stakeholders to engage in since it concerns research in key areas relevant for development such as climate change, urbanisation, water, energy, health and food security.

Research universities are central to building national capacity both for research, innovation and advanced education. Depending on their quality and resources, they are part of the global knowledge economy. Top research universities in industrialised countries (often referred to as the Super RUs) usually dominate the global ranking tables. In contrast, their counterparts in middle and low-income countries are striving to reach that stage and are serving as engines of local knowledge development and natural leaders of their own evolving academic systems. As these systems become increasingly complex and the need to nurture knowledge networks for research grows ever more essential, the success of these institutions becomes even more crucial for national development policy.

During the past 20 years, the general trend has been to combine research and innovation within the same policy package. Research and innovation policy now differs radically from previous generations of science and technology policies in three key respects that resonate well with the needs of African countries, it:
1. Emphasizes the need for universities and other public research providers to pursue research agendas that are anchored in the needs of the society which they inhabit
2. Promotes public-private partnerships as a key mechanism for achieving linkages between the economy and higher education and research
3. Embraces a system perspective

In the context of many African countries, building research capacity necessitates a primary focus on acquiring the critical mass of S&T personnel necessary to meet the most immediate local needs such as the production of students, conducting research etc. While too heavy of a reliance on donors is a risky strategy, it is clear that donors play an important role in Africa, particularly during times of weakened economies and lingering recovery.
Against the background of the changing global landscape in higher education and research, it is important for African countries to apply strategies that enable them to get access to global networks while meeting local needs.

This expert meeting will bring together 25 - 30 participants from Africa, Asia, and OECD countries to reflect on the changing higher education and research landscape and its implications on research and innovation policy, leadership and implementation in the context of Africa.

The specific objectives of the meeting are to:

- Identify professional, capacity and policy gaps to address effective research and innovation management at policy and institutional levels
- Identify strategic options that can address the identified gaps

The discussions of this meeting will be guided by conceptual reports and case studies that have been commissioned as a part of the OECD/IHERD project.

**Participation by invitation**, targeted experts are:

- Policy-makers and policy-shapers of research and innovation policies
- Academics in the fields of innovation, higher education and research for development
- Research leaders and managers from:
  - Higher education institutions
  - Public research organisations
  - Research funding agencies
  - Development Assistance Agencies supporting higher education and research

**Contacts:** Ms. Åsa Olsson, Email: åsa.olsson@oecd.org; Paulos Chanie, Email: paulos@ossrea.net
Relevant reports for the meeting

- **Report on research funding instruments and modalities** - Defines and describes key funding instruments used to provide public support for research and innovation and analyse their impact on key policy issues.

- **Synthesis report on Centre of Excellence as a tool for capacity-building?** Presents necessary requirements on policy and institutional levels for making Centres of Excellence a viable tool for developing robust teaching, research and innovation capacities. In addition to the overall report two case studies are available, notably India and South Africa.

- **The evolving path for strengthening research and innovation policy for development** - Places development assistance to research in a broader context and describes the research funding landscape in foreign aid assistance.

- **Case study on the African Union Research Grants** - presents the construction of the policy context and the governance, operation conditions and the evaluation mechanism with the view to say something of the potential impacts of this funding scheme and for a possible launch of an African Framework Programme of Research.

- **Case study on the Pan-African University** - describes the policy context, the governance and the operation conditions with the view to say something of its feasibility for achieving the intended policy objectives.

- **Increasing the effectiveness of research and innovation management** - presents strategies and options that developing countries could adopt to address knowledge and skills gaps and build capacity for more effective research and innovation management based on experiences from Cambodia, Vietnam, Malaysia and Thailand, which were presented and discussed at an Expert meeting in Kuala Lumpur in February 2013.

- **Research and Innovation Management: Comparative Analysis of Ghana, Kenya and Uganda** - presents strategic options that developing countries could adopt to build capacity for more effective research and innovation management based on experiences from Kenya, Uganda and Ghana.

- **Research Universities - Networking the knowledge Economy** - Special Issue Published by Studies in Higher Education, Society for Research into Higher Education, following an international seminar organised jointly by the OECD and the Centre for International Higher Education, Boston College, in October 2012.

The reports described above could be found here: [http://www.oecd.org/sti/iherd-final-reports.htm](http://www.oecd.org/sti/iherd-final-reports.htm)
Day I (19 September)

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<tr>
<td>08.30-09.15</td>
<td>Registration</td>
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<td>09.15-09.30</td>
<td>Opening Session</td>
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<td><strong>Chair:</strong> Mr. Paulos Chanie, Director of Research, Organization for Social Science Research in Eastern and Southern Africa (OSSREA)</td>
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<td><strong>Welcome remarks:</strong></td>
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<td></td>
<td>- Ms. Åsa Olsson, IHERD project manager, Division of Country study and Outlook Division, OECD Directorate of Science, Technology and Industry</td>
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<td>- Mr. Paschal Mihyo, Executive Director, Organization for Social Science Research in Eastern and Southern Africa (OSSREA)</td>
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<td>- Ms. Lena Johansson de Château, Research Advisor, Research Cooperation Unit, Department for Global Cooperation, Swedish International Development Cooperation Agency (Sida)</td>
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<td>09.30-10.30</td>
<td><strong>Session I: Trends in research and innovation policy and implications for Africa</strong></td>
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<td><strong>Introduction</strong></td>
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<td>Many African countries have established policies and strategies which integrate higher education and research into macroeconomic policies to stimulate technological renewal (research and innovation policy). Although this is a general trend, actual funding commitments are often missing which has resulted in weak research infrastructure, few academic researchers and heavy reliance on foreign funding for research.</td>
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<td>Further, many developing countries have legacies of political and social instability. These legacies often mean that there are “sensitive topics” on which research is not generally encouraged. This implies that the identification of knowledge and skills gaps for research and innovation policies by universities, funding agencies and policy makers in developing countries cannot be completely de-contextualised from the political and social reality of the developing countries concerned.</td>
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<td><strong>Key questions to be addressed:</strong></td>
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<td>- What are the main advantages and challenges with the current research and innovation policies in Africa at the national level?</td>
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<td>- What are the options for addressing the defragmentation and the imbalance of the governance structure of research and innovation, including improved coordination between governmental agencies providing support for research and innovation?</td>
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<td>- What can be done to increase the commitment and understanding amongst policy-makers about the critical linkages between national development and research and innovation?</td>
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**Moderator:** Mr. Jonathan Chuks MBA, Research and Academic Planning, African Association of Universities

**Presentations:**
- Ms. Åsa Olsson, IHERD project manager, and Natalie Cooke, consultant, Division of Country Study and Outlook Division, OECD Directorate of Science, Technology and Industry, presentation of the findings of the *IHERD report on the evolving path for strengthening research and innovation policy for development*
- Mr. Philippe Mawoko and Bi Irié Vroh, Science and Technology Policy, Human Resource Science and Technology, African Union Commission

**Lead Commentator:**
Mr. Eli Katunguka, Professor and Director of Research, Makerere University, Uganda

**Q&A and Discussion**

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<td>10.30-11.00</td>
<td>Coffee break</td>
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<td>11.00-12.30</td>
<td>Session II: Research funding instruments and modalities</td>
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**Introduction:**
Most African countries use block grants (i.e. direct institutional allocations) to support research. This is the cheapest form of allocation and with the advantage of allowing better institutional planning. They also allow institutional autonomy for research performers and may function as a necessary corrective to steering. This corrective is functional, as it is difficult for planners to foresee the full scope of research competences that may be required in the future. Block grants are also good instruments for promoting bottom-up input.

On the other hand, allocation of research funding in a competitive based approach has several advantages for the principal (research agency, ministry, etc.). The chief among these is that it allows the funding allocations for research to be targeted at specific objectives in a way that direct institutional allocations cannot always achieve. Another is that since the peer review system is the usual mode of evaluation, the focus on competitive allocation, other things being equal, should lead to improved performance because scientists need to compete with each other to attract funding.

A new funding instrument that is increasingly applied across the world is Centre of Excellence (CoE) for promoting capacity building in research and innovation. This model is increasingly used in developing countries. In addition, funders are increasingly applying “meta instruments." These instruments coordinate research and innovation investments transnationally. The target group is research-funding institutions as opposed to research performing organisations and they typically include a portfolio of research funding instruments.

**Key questions to be addressed**
- What are the main advantages and disadvantages of different funding instruments and modalities to achieve capacity building in research and innovation?
- What opportunities exist for African countries to participate in "Meta instruments"?
- What policies and management can favour the emergence and expansion of COEs in Africa?

**Moderator:** Mr. Benjamin Buclet, Head of Capacity Building Department, Institute for Research and Development, IRD.

**Presentations:**
1. Ms. Åsa Olsson, IHERD project manager, Division of Country study and Outlook Division, OECD Directorate of Science, Technology and Industry, presentation of
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<td>12.30-14.00</td>
<td>Lunch</td>
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2. Mr. Venni Venkata Krishna, Centre for Studies in Science Policy, School of Social Sciences, Jawharlal Nehru University, New Delhi; on the *findings from the study on Centre of Excellence as a tool for capacity-building*?

3. Mr. Krish Bharuth-Ram, University of KwaZulu-Natal, South Africa on the *findings from the case study on Centre of Excellence in South Africa*.

Lead commentator:
Mr. Ebrima Sall, Executive Director, CODESRIA
Q&A and Discussion
Globalisation, increasing international mobility and rapid technological change, while creating significant social benefits on a worldwide scale, also present significant challenges for developing countries. For example, the cost of commercialisation of research products can be prohibitive in situations where an expensive bureaucracy is required to protect patents and fend off counter-claims of ownership by well-funded global rivals; 'brain drain' can quickly whittle away many of the immediate benefits of years of public investment in building a reserve of highly trained researchers; and rapid technological change means that even keeping up with contemporary research in laboratory-based and technological fields requires ongoing and ever-increasing expenditure on new items of equipment. These costs are difficult to sustain for developing economies.

Against the backdrop of these changes, management of R&D and innovation has emerged as a specialised area within both funding agencies and higher education institutions, creating two critical target groups for capacity-building for developing countries. Key areas include: managing funds, liaising with funding bodies, project planning, implementation, monitoring and evaluation, as well as publications, research dissemination and, in some cases, commercialisation. In a strong institution, governance and management roles and boundaries will be clearly defined and respected and processes will be transparent. This ensures clear lines of accountability.

**Key questions to be addressed**
- What are the necessary skills and knowledge requirements at policy and institutional levels for managing research and innovation in Africa?
- How can skills and knowledge be best developed and harnessed in Africa?
- What can African countries learn from other developing countries?

**Moderator:** Dr. Alma Maldonado, Educational Research Department, Centre for Advanced Research

**Presentations:**
- **Mr. James Otieno Jowi**, Executive Director, African Network for Internationalisation of Education (ANIE), Kenya, on the findings of the report on *Research and Innovation Management: Comparative Analysis of Ghana, Kenya, Uganda*

**Lead commentator:**
- **Ms. Benigna Jesus Zimba**, Eduardo Mondlane University, Mozambique
- **Mr. Paschal Mihyo**, Executive Director, Organization for Social Science Research in Eastern and Southern Africa (OSSREA)

**Q&A and Discussion**
### Session IV: African Union initiatives

#### Introduction

The African Union (AU) consists of 54 member countries and seeks to accelerate the political and socio-economic integration of the continent. The African Union Commission leads the work on science and technology policies. In 2005 the first continent wide strategy was adopted by the African Ministerial Council on Science, called Africa’s Science and Technology Consolidated Plan of Action (CPA).

The overall objectives of the CPA are twofold:

- To enable Africa to harness and apply science, technology and related innovation to eradicate poverty and achieve sustainable development
- To ensure that Africa contributes to the global pool of scientific knowledge and technological innovations.

The Department of Human Resources, Science and Technology has, together with the New Partnership for Africa's Development, the mandate to drive strategic programmes.

The implementation of the plan takes place through regional, continental and international cooperation, which aims to (i) improve the quality of science, technology and innovation policies of African countries through promoting and sharing experiences and policy learning, (ii) strengthen the capacity of regional economic bodies to mainstream science and technology into their sectoral programmes and (iii) establish projects with the view to improve the quality and intensity of regional cooperation.

#### Key questions to be addressed

- What are the main support measures to achieve the objectives outlined in the Consolidated Plan of Action?
- What are the current opportunities and challenges faceting the Pan-African University?
- What are the opportunities and challenges for developing the African Union Research Grant to an African Framework Programme for Research?

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#### Moderator: Mr. Philippe Mawoko, Science and Technology Policy, Human Resource Science and Technology, African Union Commission

#### Presentations:

- Dr. Anshu Padayachee, CEO Santrust and Ms. Charmaine Williamson, Programme Manager, Santrust, findings from the study on the Pan-African University and the African Research Grant.

#### Lead commentators:

- Mr. Yohannes Woldetensae, Focal Officer for Quality in Higher Education, African Union.
- Mr. Callistus Ogol, Focal Officer for Pan African University, African Union
- Ms. Monica Idinoba, Focal Officer for STI programmes, African Union

#### Q&A and discussion

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**Moderator: Mr. Philippe Mawoko, Science and Technology Policy, Human Resource Science and Technology, African Union Commission**

**Presentations:**

- Dr. Anshu Padayachee, CEO Santrust and Ms. Charmaine Williamson, Programme Manager, Santrust, findings from the study on the Pan-African University and the African Research Grant. |

**Lead commentators:**

- Mr. Yohannes Woldetensae, Focal Officer for Quality in Higher Education, African Union.
- Mr. Callistus Ogol, Focal Officer for Pan African University, African Union
- Ms. Monica Idinoba, Focal Officer for STI programmes, African Union

**Q&A and discussion**

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| 18.30 | Dinner |
### Session V: Challenges and opportunities for African universities to increase knowledge production

#### Introduction

This session will address challenges and opportunities for African policy makers and institutional leaders at universities and public research institutions to increase knowledge production through academic research. This session will highlight trends on policy and in universities.

#### Key questions to be addressed:

- **What is needed to encourage governments and leaders of research and innovation to translate policy ambitions into focused plans of action?**
- **How to strengthen knowledge amongst policy makers so that they appreciate the importance of institutional autonomy, thus allowing universities to make a significant contribution to research and innovation?**
- **How to develop a commitment to the importance of the development of a national research ethics framework when countries develop their research capacities?**
- **What role can development assistance actors play to support the development and implementation of research and innovation policy at national levels? What are the limitations?**

#### Moderator: Mr. Paulos Chanie, Director of Research, OSSREA.

#### Presentations:

- **Mr. Nico Cloete**, Director, Centre for Higher Education Transformation, South Africa, *findings of the HERANA project, summarised in the report on challenges and opportunities for African Universities to increase knowledge production*

#### Lead commentators:

- **Mr. Venni Venkata Krishna**, Centre for Studies in Science Policy, School of Social Sciences, Jawharlal Nehru University, New Delhi
- **Mr. Berhanu Abegaz**, Executive Director, African Academy of Sciences

### 11.00-11.30 Coffee break

### 11.30-13.00 Session VI: Concluding Session: Key lessons for policy and practice
Introduction
The world-wide balance is shifting toward emerging countries, not only in terms of income, but also in terms of research and innovation. The accelerated pace of investment in these areas by emerging countries calls for efficient and intelligent use of these resources. Institutional arrangements and policies are the main determinants of efficiency: from that perspective there is a lot developing countries can learn from emerging countries, while at the same time experiments conducted in developing countries can be a source of inspiration for developed ones. IHERD has started capitalizing experience and sharing it on both sides over the past two years. What should come next?

Key questions to be addressed
- Among the various policy avenues identified during the expert meeting, what are the most promising?
- What issues should be targeted in the coming years?

Moderator: Ms. Åsa Olsson, IHERD programme manager, OECD Directorate for Science, Technology and Industry

Panellists:
- Mr. Paschal Mihyo, Executive Director, Organization for Social Science Research in Eastern and Southern Africa (OSSREA)
- Mr. Philippe Mawoko, Science and Technology Policy, Human Resource Science and Technology, African Union Commission
- Ms. Lena Johansson de Château, Research Advisor, Research Cooperation Unit, Department for Global Cooperation, Swedish International Development Cooperation Agency (SIDA), Sweden
- Mr. Benjamin Buclet, Head of Capacity Building Department, Institute for Research and Development, IRD.

Floor Discussion

13.00 Closure and Lunch