



AFRICALICS

Conference Proceedings

4th AfricaLics International Conference

22nd - 24th October 2019

Hosted by

STIPRO, University of Dar es Salaam (UDSM) and COSTECH

Theme:

***Innovation and Transformative Capacities for Growth
and Sustainable Development in Africa***



4th AfricaLics international conference group photo

Acknowledgements

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- STIPRO
- COSTECH
- UDSM

Acronyms

ACTS	African Centre for Technology Studies
ACET	African Center for Economic Transformation
AAU	Addis Ababa University
AAiT	Addis Ababa Institute of Technology
AfricaLics	African network for Research Training on Innovation and Competence Building Systems
ASB	AfricaLics Scientific Board
CBE	College of Business and Economics
ConfTool	Online conference management system
CeSTII	Centre for Science, Technology and Innovation Indicators
CSIR-STEPRI	Council of Science and Industrial Research - Science and Technology Policy Research Institute
COSTECH	The Tanzania Commission for Science and Technology
Eu-SPRI	European Forum for Studies of Policies for Research and Innovation
Globelics	Global Network for Economics of Learning, Innovation, and Competence Building Systems
HSRC	Human Sciences Research Council
IDRC	International Development Research Centre
JKUAT	Jomo Kenyatta University of Agriculture and Technology
LICS	Low Income Countries
LMICS	Low Middle Income Countries
MSM	Maastricht School of Management
MSMEs	Micro- Small and Medium Enterprises
STIPRO	Science, Technology and Innovation Policy Research Organization
UDSM	University of Dar es Salaam
UDIEC	University of Dar es Salaam Innovation and Entrepreneurship Centre
REPOA	Research on Poverty Alleviation
R&D	Research and Development
SDGs	Sustainable Development Goals
SJUIT	St. Joseph University in Tanzania
SMEs	Small and Medium enterprises
Sida	Swedish International Development Cooperation Agency
SSA	Sub Saharan Africa
STEM	Science, Technology, Engineering and Mathematics
STRN	Sustainability transitions research network
STI	Science, Technology and Innovation
STISA	Science, Technology and Innovation Strategy for Africa
TIP	Transformative Innovation Policy
TIPC	Transformative Innovation Policy Consortium
UDIEC	University of Dar es Salaam Innovation and Entrepreneurship Centre
UAM	Universidad Autónoma Metropolitana
WUR	Wageningen University and Research

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Executive summary

The African network for Research Training on Innovation and Competence Building Systems (AfricaLics) is a network of scholars in Africa and beyond who are interested in innovation and development focused on Africa's development. One of the objectives of AfricaLics is to increase quality research in innovation within specific relevant areas for Africa's development and encourage its increased use by scholars and policy makers in the region and globally. One proposed activity towards this end is to conduct annual conferences thus creating a platform for domestic scholars and international scholars to meet up towards achieving this endeavor. The 4th AfricaLics conference took place in Tanzania from 22nd to 24th October 2019 and was hosted by STIPRO in collaboration with the University of Dar es Salaam (UDSM) and the Tanzania Commission for Science, Technology and Innovation (COSTECH). It brought together 150 leading scholars from 22 countries working on innovation and development in Africa with a number of scholars from outside Africa. It follows a successful pre-conference meeting that was held at UDSM on 17th April 2019. The purpose of this pre-conference was to sensitize on the conference and subsequently increase the number of successful applicants from Tanzania as the host country. The pre-conference was attended by 43 participants from academia, research institutions, government agencies and the private sector, of whom 22 were female and 21 were male.

The Conference programme comprised of interactive activities namely research paper presentation sessions, plenary sessions and a series of thematic sessions discussing 'neglected' topics in the field. This report highlights the deliberations as well as other non-academic activities that contributed to a very successful event. Details of each of the activity are annexed to this report.

1. Background

AfricaLics has aimed to hold a research conference every two years at a minimum since the launch of the network in 2012. The focus is primarily the current state of research on African Innovation and Development specifically for the academic community, but also targeting policy makers and business community. It aims to bring together leading scholars (between 150 - 200) working on innovation and development in Africa with the foremost scholars from outside Africa as well as policy makers and business community interested in this field.

1.1 The 1st AfricaLics Conference

The first International Conference was held in Maputo, Mozambique in 2013. It was organized as a research workshop aimed at bringing together researchers from the innovation and development community towards providing a space for creative thinking concerning new research projects or research dissemination projects in this area. It was a first step towards the possible funding of new networked research projects that take cognizance of Africa's development in view of its unique context. The themes of the first conference were guided by a number of thematic areas that were agreed upon during the launch of AfricaLics in Dar es Salaam in 2012. These themes outlined below were considered to be essential to the development of African economies and livelihoods.

These are:

- The role of women in Africa's innovation systems.
- Work organization and competence building in formal and informal sectors.
- Overcoming raw material curse through new manufacturing and service activities.
- National strategies to stimulate spill overs from BRIC-presence in Africa.
- Engineering design capacity building and economic development in Africa.
- Building Low-carbon Energy Innovation Systems.
- Agro-industrial innovation systems and food security.
- The role of financial institutions in relation to innovation and development in Africa.
- Other areas of interest (e.g. health innovation)

The workshop was also part of the efforts by AfricaLics network to enable groups of researchers to apply for seed funding for research projects and book projects.

1.2 The 2nd AfricaLics Conference

This conference was the first conference focusing on the current state of research on African Innovation and Development to be held in Africa specifically targeting the academic and policy communities. It took place in Kigali, Rwanda from the 17th - 19th November 2015 and was hosted by University of Rwanda, College of Business and Economics (CBE). The theme of the Conference was "Unpacking systems of innovation for sustainable development in Africa". It brought together over 200 leading scholars from 30 countries working on innovation and development in Africa.

The objectives of this conference were:

- To determine the state of the art within research community in Africa working in the field of innovation and development.
- To provide a much-needed arena for researchers in Africa, particularly early career researchers, to build capacity in presentation and networking skills as well as learning about new methods and theories.
- To promote networking and create space for new collaborations amongst researchers in the field of innovation and development focusing on Africa.
- To build capacity to teach high quality, fit for purpose curricula in the field of innovation and development in Africa.

1.3 The 3rd AfricaLics Conference

The third AfricaLics Conference was held in Oran, Algeria from the 27th - 29th November, hosted by University of Oran 2. The overall theme of the conference was "Emerging innovation systems for sustainable development in Africa". It brought together over 120 leading scholars from 28 countries working on innovation and development in Africa with a number of scholars from outside Africa.

The main objectives of this conference were:

- To present and discuss state of the art research in the field of innovation and development in Africa with focus on the promotion of sustainable industrialization.
- To provide a much-needed arena for researchers in Africa, particularly early career researchers, to build capacity in presentation and networking skills as well as learning about new methods and theories.
- To promote networking and create space for new collaborations amongst researchers in the field of innovation and development focusing on Africa.
- To build capacity to teach high quality, fit for purpose curricula in the field of innovation and development in Africa.

1.4 The 4th AfricaLics Conference

The fourth AfricaLics Conference was held in Dar es Salaam, Tanzania from the 22nd - 24th October 2019. The overall theme of the conference was "Innovation and transformative capacities for growth and sustainable development in Africa". This report summarizes key deliberations during the different activities that took place. Details of each of these activities are annexed to this report.

2. Highlights of the Conference

The fourth AfricaLics Conference was a three-day event hosted by STIPRO in collaboration with UDSM and COSTECH as co-hosts. The 5th AfricaLics Scientific Board (ASB) annual meeting was embedded within the conference timeline (21st October 2019 and lunch hour of the 23rd October 2019).

The programme comprised of interactive activities namely; plenary sessions, paper parallel sessions and thematic sessions. All of the events were held at the main campus, UDSM, Ubungu, Dar es Salaam, Tanzania. The Conference brought together over 120 delegates from 22 countries as shown in Annex 4. This report highlights key deliberations during different sessions within the conference. Details of each of these activities are annexed to this report.

2.1 Overview of the Conference Programme

The Conference programme was structured around different sessions (Table 1).

Table 1: summary of different sessions and activities

<p>Conference opening ceremony</p>	<p>Official opening session</p> <ul style="list-style-type: none"> ▪ President, AfricaLics, Dr. Bitrina Diyamett ▪ Director General of the Commission for Science, Technology and Innovation (COSTECH), Dr. Amos Nungu ▪ Swedish International Development Cooperation Agency (Sida), Tanzania representative <p>Opening address Minister of Industry, Trade and Investment, United Republic of Tanzania</p>
<p>Plenary Sessions</p>	<p>A number of sessions took place in plenary. These included; opening ceremony, keynote addresses, expert panel sessions and the closing ceremony.</p>
<p>Paper sessions Parallel</p>	<ul style="list-style-type: none"> ▪ Each paper parallel session included 3 - 4 papers and lasted approximately 90 minutes. The paper presenters highlighted one or two issues from the other papers presented in the session of particular relevance to their own work. One discussant subsequently commented on all papers presented in the session. The discussions then continued within the plenary. ▪ The standard time scheduled for each paper presentation session was as follows; <ul style="list-style-type: none"> a) Introduction (5 minutes)

	<ul style="list-style-type: none"> b) First paper presentation by the author (12 - 15 minutes) c) Second paper presentation by the author (12 - 15 minutes) d) Third paper presentation by the author (12 - 15 minutes) e) Fourth paper presentation by the author (12 minutes) f) Discussant's feedback on all papers (12 - 15 minutes) g) General discussion and replies from the authors (25 minutes)
Thematic sessions	<ul style="list-style-type: none"> ▪ In addition to the parallel paper sessions where full papers are presented, three thematic sessions were organized during the conference that took place in parallel on day 2 and 3. The thematic sessions were organized as round table/panel discussions and focused on specific themes.
Social events	<ul style="list-style-type: none"> ▪ Dinners were hosted for the participants during the conference.
Closing Ceremony	<ul style="list-style-type: none"> ▪ Closing ceremony held on 24th October 2019 with representative of the Vice Chancellor, University of Dar es Salaam (UDSM) as the guest speaker.

2.2 Conference paper submission and review process

The Secretariat initiated an open call that invited submission of applications of original unpublished papers for the conference in line with main conference theme or one of the sub-themes. The requirements included submission of full paper (in PDF) not exceeding 8,000 words (including notes, tables, appendices, list of references etc.) through online conference management system (ConfTool). The system helped in management of the paper review process. The call encouraged participation of young researchers and female scholars from Low Income Countries (LICS) and Low Middle Income Countries (LMICS). The selection of the papers was based on a peer review process. The Conference Scientific Review Committee was made up of members of the local organizing committee (staff from STIPRO, UDSM & COSTECH) and senior scholars from the AfricaLics community, ASB and the Secretariat.

A total of 89 scholars, appointed by AfricaLics Secretariat and the local organizing committee, contributed as reviewers. The referee corps were very essential to control the quality of papers presented at the conference. The ASB and the AfricaLics Secretariat were grateful for the contribution of scholars that dedicated their valuable time and support in reviewing conference submissions.

The 4th AfricaLics conference received over 300 full paper submissions from which 83 were selected for presentation. The selection of the 83 papers was

based on a double-blind peer review process focusing on relevance to the conference theme and sub-themes, originality, research methods, relevance, academic and scientific quality and originality.

3. The opening ceremony

Introduction of the officials by Master of Ceremony Dr. Adalgot Komba, Chairman of the board of STIPRO

Dr. Komba introduced officials at the high table:

- Prof. Damian Gabagambi representing guest of honor, Honorable Innocent Lughu Bashungwa, Minister of Industry, Trade and Investment, United Republic of Tanzania.
- Dr. Saudine Mwakaje, representing Prof. William Anangisye, Vice Chancellor, UDSM.
- Dr. Amos Nungu, Director General, COSTECH.
- Dr. Bitrina Diyamett, President, AfricaLics and Executive Director, STIPRO.

Welcome remarks by Vice Chancellor of UDSM represented by Dr. Saudine Mwakaje

Dr Mwakaje, welcomed all participants at the UDSM. He mentioned that UDSM recognizes the importance of innovation policy and practice as an academic undertaking, and for that reason created the University of Dar es Salaam Innovation and Entrepreneurship Centre (UDIEC) in 2015. The main goal of UDIEC is to facilitate entrepreneurship and demand driven innovation through practice-oriented training quality education, business counselling and incubation to students, staff, micro-small and medium enterprises (MSME) and other stakeholders. The conference theme was notably well aligned with the government policy towards industrialization.

Dr. Mwakaje mentioned that innovation in industrial development is currently very high in the agenda of many governments in the world. However, there have been major concerns that industrial development in most cases translates into some form of irreversible environmental damage. In the same way innovation can lead to industrial development, it can possibly be applied to address environmental concerns. The need for economic development and the environment preservation are two parameters that need to be taken care of in a complex equation, hence policies need to address or balance these parameters so we can reap the benefits of both. Legal aspects especially Intellectual property rights (IPR) need to be considered in innovation.



Dr. Saudine Mwakaje, Chief Corporate Counsel and Secretary to Council, UDSM

In his concluding remarks, he thanked AfricaLics for choosing UDSM as a host for the 4th International conference, 2019.

Welcome remarks by Dr. Bitrina Diyamett, President, AfricaLics

Dr. Diyamett thanked the local organizing committee for the hard work in making this conference a success. She also thanked COSTECH and UDSM for financial support, and UDSM for providing the conference venue.

She gave a background about AfricaLics and noted that, this is a network of researchers and academics interested in strengthening the use of innovation and related activities to speed up social and economic development of African countries. The network was initiated in 2012 in Dar es Salaam, Tanzania.

She mentioned that Africa is losing a lot by exporting its natural resources unprocessed or only semi processed. She added that there is no way Africa can reverse this trend if the continent is not ready to invest in knowledge. It is more critical now because of a rapid technological change and automation that is currently taking place worldwide. Hence, for a nation or a firm to survive, it has to invest in knowledge generation and dynamically innovate.

There are two major types of knowledge for development:

- **First**, is knowledge for the production of new and improved products and processes; this is normally produced through research that is largely in the field of natural and engineering science (normally understood as R&D).

- **Second** kind of knowledge is that which is used for decision making, normally produced through social science research. Within this category, is an emerging sub-field of innovation and development, innovation studies, science and technology studies.



Dr. Bitrina Diyamett, Out-going president, AfricaLics

She pointed out that very little recognition and investment is given to the innovation knowledge in Africa. For instance, less than 10% of innovation publications are on developing countries, and most of the authors are from developed countries. The concept of innovation is dynamic, in the sense that models around it have always been slightly changing. Recently, academic and policy discourses on innovation seem to be taking a new turn in the history of innovation studies, a turn away from emphasizing innovation theories and models that are based on productivity and growth to those focusing on environmental issues and inclusivity.

She reiterated that it is the role of innovation and development researchers to undertake research, provide context based evidence and influence the direction of the innovation studies so that it is also suitable for the African context;

Otherwise, the existing innovation models, as they are now, have a number of shortcomings for their use in the African context.

- a) The older, growth-oriented innovation models - having come from the North - are not yet clearly understood in an African context
- b) While in the now rich countries, innovation led growth has taken roots and is taking place through clear cut market mechanism, and therefore hardly need policies to influence them, in poor countries such as those in Africa - where growth promoting innovation has not taken roots, markets and systems for the production, dissemination and use of knowledge, are weak - a policy guidance is of absolute necessity.
- c) It is not clear how transformative innovation model can help African countries to grow their economies and generate massive employment that the continent needs more than any other part of the world.

African countries have currently realized the role of STI. They are either reviewing or making new policies. But, how are these policies being made? What informs them? Most likely by models developed through empirical evidence generated in more developed countries, and this is largely the reason such policies are making only very limited impact on social and economic development of African countries. She concluded by urging researchers to find answers for these challenges of innovation models suitable for Africa. Innovation is context specific, evolutionary and path dependent, hence it is the role of researchers to figure out how to best address this grand challenge.

Welcome remarks by Dr. Amos Nungu, Director General of the Commission for Science, Technology and Innovation (COSTECH)

In his welcome remarks, Dr. Nungu informed the congregation that COSTECH is a parastatal organization with the mandate of being the principal advisory organ to the Government on all matters relating to scientific research and technology development in the Country. Its mission is to foster knowledge-based economy through promotion and coordination of research, technology development and innovation for sustainable development in Tanzania. Hence it has a strong link to the AfricaLics conference.

He mentioned that Africa needs to take an active role in initiating activities that can address local challenges and consequently cascaded to the world. He challenged conference participants to come up with deliberations that are relevant to Africa, tailored to national and regional context and priorities. He concluded by stating that COSTECH is a national body responsible for

coordination of STI and will be ready to work on the deliberations coming out of the conference.



Dr. Amos Nungu (middle), Director General, COSTECH, Tanzania

Official Opening address - Hon. Innocent Bashungwa - Minister of Industry, Trade and Investment, United Republic of Tanzania

The guest of honor's speech was read at the conference by Prof. Damian Gabagambi. He noted that nations that are at the forefront of generating innovations are the same that are rapidly advancing economically. Innovations are a source of new products and solutions that address problems in the communities. Society needs innovations continuously to create opportunities for the younger generation, but also to improve the wellbeing of members of the community. Prof. Gabagambi added that as the population grows, lifestyles and consumption patterns change, there is growing demand for energy, water, food, housing, education, health care and transport. Productivity needs to be improved to meet the growing needs and diminishing resources. New production processes that have few or no effect on the environment need to be invented and applied accordingly. Cleaner sources of energy have to be invented and developed; hence innovation is needed to implement this.



Prof. Damian Gabagambi, representing Minister of Industry, Trade and Investment, Tanzania

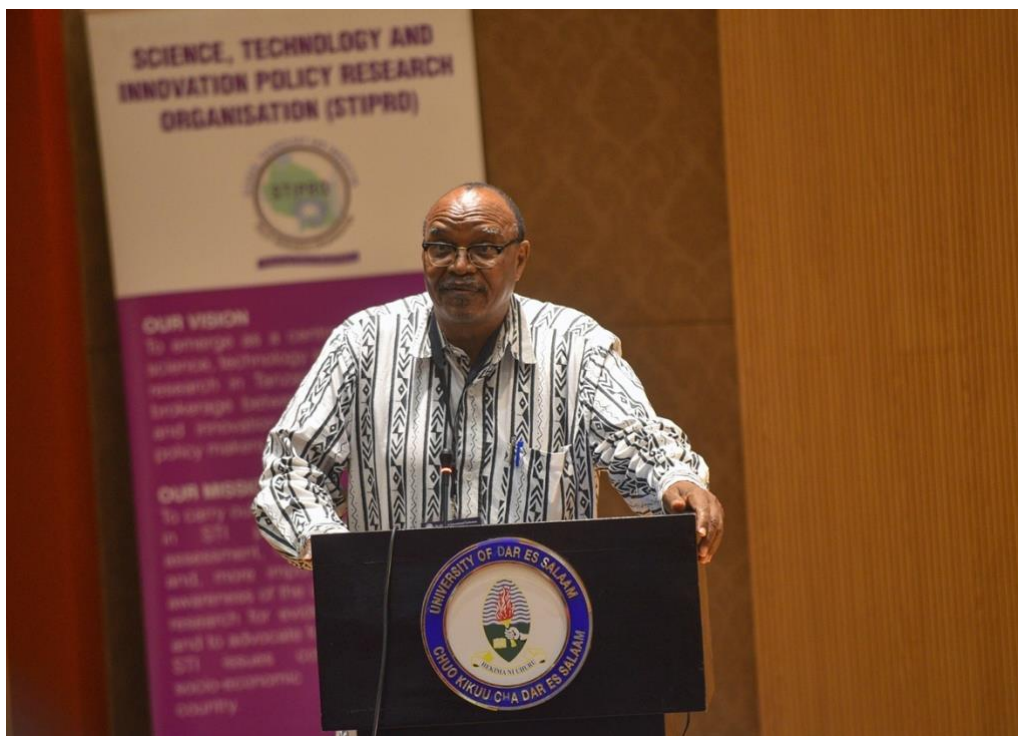
He noted that the 4th Industrial Revolution (4IR) is making more and more use of knowledge worker than physical worker. Developing Countries have to take serious note of how they will likely be affected by the 4IR and take necessary precautions. Developing Countries have to depart from the type of education that trains youth to memorize and reproduce and train people who are able to think independently. These are African minds that can unpack, interpret and question the validity of globally used concepts related to innovation and transformative changes, and how they apply to an African environment, because innovation to a large extent is context specific.

He concluded by requesting to receive concrete recommendations from this gathering of learned experts of innovation and development that they wish the Governments to pursue.

4. Keynotes addresses

Keynote address 1: Industrialization and Sustainable Development - the Tanzanian Perspective

The first keynote was delivered by Prof. Samuel Wangwe, Principal Research Associate, Economic and Social Research Foundation, Dar es Salaam, Tanzania.



Prof. Samuel Wangwe, Principal Research Associate, Economic and Social Research Foundation

Dr. Wangwe mentioned that industrial development goes in phases. He described the phases and their characteristics and challenges. He further emphasized on the need to reform state owned enterprise in a way that they can grow instead of reform in a way that they are going to die. Dr. Wangwe explained that we should be mindful on innovation sustainability for development, making sure that technological development takes into account environmental issues. Growth and industrialization should be people centered, which means poverty alleviation and sustainability need to go simultaneously. Selective protection is a necessary measure as Africa opens up for competitiveness.

Keynote address 2: Open Innovation: Lessons from China and relevance for Sustainable Development in Africa

The second keynote was by Prof. Xiaolan Fu, Professor of Technology and International Development, University of Oxford, UK.



Prof. Xiaolan Fu, Professor of Technology and International Development, University of Oxford, UK

In her presentation, Prof. Fu highlighted a number of things. She noted that China is currently an innovation powerhouse in the globe, so it a researchable question on how china has moved so far to be the leading producer of innovation in the world. Prof. Fu is currently researching on how a previously low-income country (i.e. China) has managed to become a developed country.

She mentioned that China uses an open National Innovation System which has multiple sources/resources and players whose drivers are not only driven by market forces but by the government forces. Open innovation system was inherited from Soviet unions. Chinese studying abroad return is exponential (Brain Gain), China is the 2nd largest investor in research and development (R&D). Much more efforts were put in local technologies and invested more on technology development. Opening up to trade contribute significantly to innovation in China. Soft capacity/skills are important, this should be given an important attention in training. Indigenous innovation is also important, it should be taken on board.

An open National Innovation System can help low-income Countries to move fast in development. The state plays the most important role in all stages especially in commercialization of the developed innovations.

Prof. Fu further elaborated on the nature and sources of innovation in Africa

- African people are very creative and innovative despite constrained resources, knowledge and institutional support
- Firms innovate in environment that does not require much investment rather it is driven by efforts
- Innovations constraints in Africa can be addressed by collaboration and sharing. In China only 5% of firms collaborate while in Tanzania, a third of firms collaborate

Keynote address 3: The Role of Universities in Transformation and Sustainable Development in Africa

The third keynote was by Dr. Glenda Kruss, Chief Research Scientist, Human Sciences Research Council (HSRC), South Africa



Dr. Glenda Kruss, Chief Research Scientist, Human Sciences Research Council (HSRC)

Dr. Kruss presented on building national higher education systems oriented towards inclusive and sustainable development. She mentioned that there is space in African Universities to understand the sectoral networks. It is important that key networks know whom they are preparing and producing the graduates for. She explained that

universities have their interactive mechanisms/ bodies, giving examples of the likes of advisory boards, professional associations etc. who would take active roles in mapping and building network.

Dr. Kruss concluded by encouraging the participants to take an active role and not focus on funding. She emphasized on focusing on Africa's competencies and the dynamic interactive capabilities to do more with what we have, responding to our social and economic development challenges.

5. Thematic/ Plenary Sessions

In addition to the parallel paper sessions where full papers were presented, nine thematic sessions were organized to take place in parallel on day 2 and 3 of the conference. The thematic sessions were organized as round table/ panel discussions and focused on specific themes.

Thematic session	Focus	Organizer	Panelists
Innovation in renewable electrification: the case of capability building through renewable electrification projects in Kenya	Renewable electrification is a key building block for economic development as Countries reassess their use of carbon fuels as a result of climate change debates. Kenya currently produces around 50% of electrification needs through renewable sources (wind, solar, hydropower and geothermal). As Countries re-assess their efforts to move towards greener energy sources, it is important to ask if such activities have the opportunity to provide spillovers into other areas of a Country's economic development activities. Specifically, can renewable electrification projects create opportunities for new job creation, new skills or new product development leading to enhanced local manufacturing or industrialization efforts in a sustainable way? What is the role of learning, innovation policies including local content	Aalborg University, Denmark	Rasmus Lema - Aalborg University, Denmark Rebecca Hanlin - ACTS/AfricaLics Secretariat, Kenya Charles Nzila - Moi University, Kenya Michael Korir - Moi University, Kenya Ann Kingiri - ACTS/AfricaLics Secretariat, Kenya Faith Odongo - Ministry of Energy, Kenya

	requirement in the path to sustainable industrialization?		
Agricultural Innovation Systems: Identifying inclusive Agricultural Innovation configurations for growth and sustainable development	<p>Aim of the session was to jointly reflect on the following questions:</p> <ul style="list-style-type: none"> ▪ What (configuration of) actors are able to really engage local smallholders in active innovation deliberation, experimentation to effectively tackle their economic and environmental challenges? ▪ For what type of crop and value chain contexts is such an innovation configuration able to perform? ▪ What type of public debate, societal learning may it evoke? ▪ What type of policy practice is needed to enhance such innovation configurations to emerge and perform? 	Wageningen University and Research (WUR), Netherlands	<p>Annemarie van Paassen - Wageningen University and Research (WUR), Netherlands</p> <p>Catherine Kilelu - ACTS, Kenya</p> <p>Gerald Katothya - JKUAT, Kenya</p> <p>Justine Adwoa Onuma-STEPRI, Ghana</p> <p>Thapa Namrata- Institute of Economic Growth, India</p> <p>Kgabo Ramoroka - Wits Business School, South Africa</p>
The role of the state in supporting innovation for inclusive transformation	<p>This panel discussion aimed to broaden people's understanding of the role of the state in supporting structural transformation.</p> <p>By using the leverage derived from its economic and political powers, the state can indeed foster capacity building and provide incentives for the necessary innovations that give impetus to the needed rural transformation.</p>	Centre for Science, Technology and Innovation Indicators (CeSTII), Human Sciences Research Council, South Africa	<p>Alexis Habiyaemye - HSRC, South Africa:</p> <p>Glenda Kruss - CeSTII, HSRC, South Africa</p> <p>Abdelkader Djeflat - Université de Lille, Algeria</p> <p>Peter Terrance Jacobs - HSRC, South Africa</p>
Towards a transformative innovation policy research agenda: Perspectives from African contexts for a	In this session, they explored how emerging understandings of TIP may help devise novel approaches to the funding and conduct of STI policy thus contributing to the timely achievement of ambitious	Transformative Innovation Policy Consortium (TIPC)	<p>Rob Byrne - University of Sussex, UK</p> <p>Ann Kingiri - ACTS/AfricaLics</p>

<p>continuing internetwork dialogue</p>	<p>international commitments to sustainable development. But, crucially, the conversation was centered around the more specific needs prevalent in the African contexts:</p> <ul style="list-style-type: none"> ▪ What do insights arising from African development challenges mean for TIP? ▪ How do we develop a shared research and practice agenda across the four communities listed above while responding to context-specific needs in African settings? 		<p>Glenda Kruss - HSRC, South Africa</p> <p>George Owusu Essegbey - STEPRI, Ghana</p>
<p>The Role of Frugal Innovation in Sustainable Development in Africa</p>	<p>This session used the following questions for discussion:</p> <ul style="list-style-type: none"> ▪ How is frugal innovation/ frugality interpreted in the African context? ▪ Which theoretical lenses have/ can be used to analyze frugal innovation in the African setting? ▪ Can/ should policy makers play a role in supporting frugal innovation in Africa? If so, how? 	<p>Centre for Frugal Innovation in Africa, Kenya Hub</p>	<p>-Elsie Onsongo - Centre for Frugal Innovation in Africa, Kenya Hub</p> <p>-Peter Knorringa - Centre for Frugal Innovation in Africa, The Netherlands</p> <p>-Donald Mmari - Research on Poverty Alleviation (REPOA), Tanzania</p> <p>-Gussai Sheikheldin - STIPRO, Tanzania</p> <p>-Manir Abdullahi Kamba - Bayero University Kano, Nigeria</p> <p>-Ofonbuk Esther Ekong - University of Ottawa, Canada</p>
<p>Promoting innovation and entrepreneurship for industrialization and development in Tanzania</p>	<p>Stimulate the debate on Africa's industrialization efforts with a lens of innovation and entrepreneurship. The panel used a case of Tanzania to unpack the Tanzanian government's political will and strategic efforts to promote industrialization.</p>	<p>UDSM</p>	<p>Mariam Nchimbi - UDSM, Tanzania</p> <p>Jumanne Mtambalike - Sahara Sparks, Tanzania</p> <p>Athmani Mgumia - COSTECH, Tanzania</p>

	<p>At the same time the panel assessed the business environment, while discussing an emerging policy space and interventions targeting the developments and formalization of SMEs.</p> <p>The panel also explored strategies which have been devised to promote women's engagement in entrepreneurship, financing mechanisms to support entrepreneurs in Tanzania and the development of skills which are the most relevant for entrepreneurs.</p>		
Engineering education, development and growth in Africa	<p>Organized to elicit discussions around how competency of engineering graduates in Africa can be enhanced through enhancing and strengthening engineering education.</p> <p>The session also deliberated on the broad and long-lasting impacts on engineering education in Africa for the sake of sustainable development and growth and how policies can be stimulated in this regard.</p> <p>The session was inspired by the "supporting the science, technology, engineering and mathematics (STEM) research cultures in Africa" program funded by International Development Research Centre (IDRC).</p>	STIPRO, Tanzania and ACTS, Kenya	<p>Juliana Machuve, UDSM, Tanzania</p> <p>Gussai Sheikheldin, STIPRO, Tanzania</p> <p>Ann Kingiri, ACTS, Kenya</p> <p>Charles Nzila, Moi University, Kenya</p> <p>Mona Lisa Dahms, Aalborg University, Denmark</p>
The 4 th Industrial Revolution and Sustainable	<p>Key questions addressed</p> <p>i. What are the key</p>	Edward Lorenz and Julius Gatune	Edward Lorenz - University of Nice - CNRS, France

Development in Africa.	<p>pre-requisites for 4IR to deliver sustainable development?</p> <p>ii. What are the main risks for increasing inequality within and across countries due to the adoption of 4IR including new emerging technologies and what are potential ways of addressing the inequality challenge?</p> <p>iii. How can 4IR contribute to transformation of economies in least developed countries with a particular focus on agriculture and service sectors?</p> <p>iv. How can industrial and social policy can be used to reduce the negative potential impacts and increase the positive potential impacts of the adoption of emerging technologies?</p> <p>v. What are the main areas where there is a need for further research on the impact of 4IR and how can the AfricaLics community best contribute to this research agenda?</p>		<p>Julius Gatune - ACET, Ghana and Maastricht School of Management (MSM)</p> <p>Susan Cozzens - Georgia Institute of Technology, USA</p> <p>Lotta Takala Greenish - UWE Bristol and University of Johannesburg, UK</p> <p>Mammo Muchie - Tshwane University of Technology, South Africa</p>
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6. Closing Session

Dr. Hezron Makundi chaired this session. He welcomed Dr. Ambrose Itika from the University of Dar es Salaam to give his closing remarks. Dr. Itika was grateful to AfricaLics for choosing Tanzania as the location for the 4th AfricaLics International conference. He also thanked the organizers for the job well done as well as participants who made the event a success. He concluded by reminding the participants that they have learnt a lot in the conference, hence there is a lot to do, and encouraged everyone do continue doing what they can to the best of their ability. Dr. Diyamett who was part of the local organizing team join Dr.

Itika in thanking all participants for having made the conference a success. She also mentioned that she was the outgoing president having served AfricaLics as a chair for the last 7 years.

In his closing remarks, Dr. Mohammed Sheikh from COSTECH also reiterated the thanksgiving to all participants and sponsors. He gave a brief overview of the COSTECH as a government entity mandated to oversee the national coordination and promotion of research on innovation. He pointed out that having the conference in Dar es Salaam was timely considering the paradigm shift relating to research and innovation - the bottom up experimentation, and that the Tanzanian government was keen on the grass-root innovators.

Dr. Kingiri, on behalf of the AfricaLics secretariat gave a summary of the logistics and mentioned that 318 papers were received, of which 89 of the accepted papers were from Sub-Saharan Africa. She also mentioned that the objectives of the conference were largely met as evidenced by the papers accepted and presented, keynote speakers and the parallel sessions. Dr. Kingiri also appreciated the ASB, mentioning that they reviewed most papers voluntarily. She also went ahead to thank the outgoing president and introduced the incoming president Dr. George Essegbey. In his maiden speech, as the incoming President and Chair of AfricaLics Board, Dr. George Essegbey was grateful for being elected, mentioning that this was his greatest achievement. He appreciated all the organizers in making the event fruitful. He concluded with an African proverb that says, "if you learnt on a journey and you want to go fast, go alone, if you want to go far go with others."

7. Social events

Two social events took place at the 4th AfricaLics conference: On the evening of 22nd October 2019, a welcome reception dinner was held at Hotel Seascap and conference center. On 23rd October 2019, a Conference dinner was hosted for participants by AfricaLics at the Sarova Whitesands beach resort. This dinner was crowned by Tanzanian traditional dancers.



Traditional dancers performing at the 4th AfricaLics conference dinner at the Sarova Whitesands beach resort, Dar es Salaam

8. Media Coverage

The conference garnered a significant amount of media coverage including social media platforms. It was also reported on the Tanzanian press both print and electronic.

The event was live streamed on Facebook and twitted live and people from different parts of the world followed using the conference hashtag [#AfricaLics2019](#) on Twitter. The hashtag had 14,800 impressions, 227 profile visits and 29 new followers on Twitter during the conference period.

Top mention earned 52 engagements

 **LDE Centre for Frugal Innovation in Africa**
@FrugalAfrica · Oct 29

Last week our Kenya Hub organized a special session at @AfricaLics on The Role of Frugal Innovation in Sustainable Development in Africa. Read more here [cfia.nl/news/the-role-...](#) #CFIAKenyaHub #LeidenDelftErasmus #innovation #frugalinnovation #GOFRUGAL pic.twitter.com/zizcXDknU2



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OCT 2019 SUMMARY

Tweets	17	Tweet impressions	14.8K
Profile visits	227	Mentions	25
New followers	29		

AfricaLics Twitter October 2019 summary

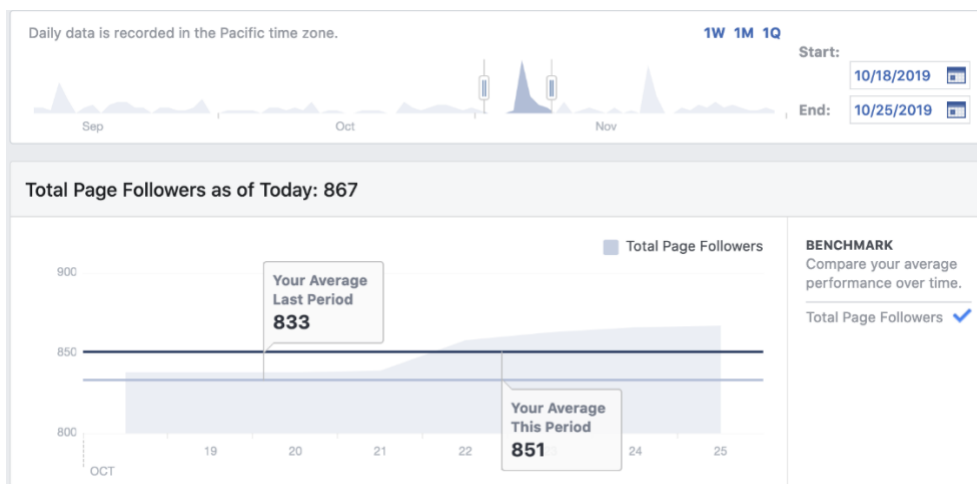
Facebook live stream had 1,867 minutes viewed and 35 new followers during this period.

Oct 17, 2019 - Oct 25, 2019

1,867 Minutes Viewed 0 Previous Period



AfricaLics Facebook livestream, October 2019 summary



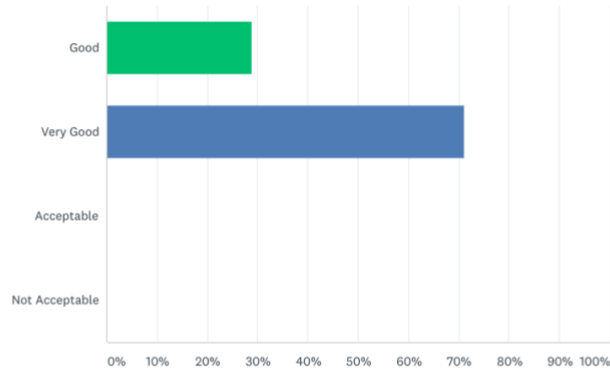
AfricaLics Facebook followers, October 2019 summary

9. Results of the evaluation survey

As shown in the results below, participants were satisfied with the general organization and overall programme structure of the conference.

General organisation of the conference?

Answered: 66 Skipped: 0

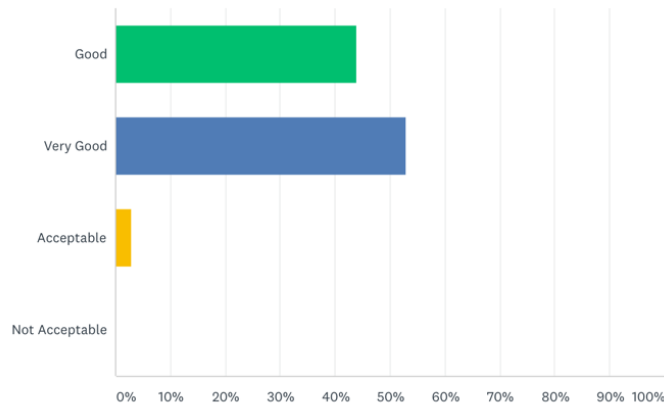


ANSWER CHOICES	RESPONSES
Good	28.79% 19
Very Good	71.21% 47
Acceptable	0.00% 0
Not Acceptable	0.00% 0
Total Respondents: 66	

Participants' perspective on the general organization of the 4th AfricaLics conference.

Overall structure of the conference programme?

Answered: 66 Skipped: 0

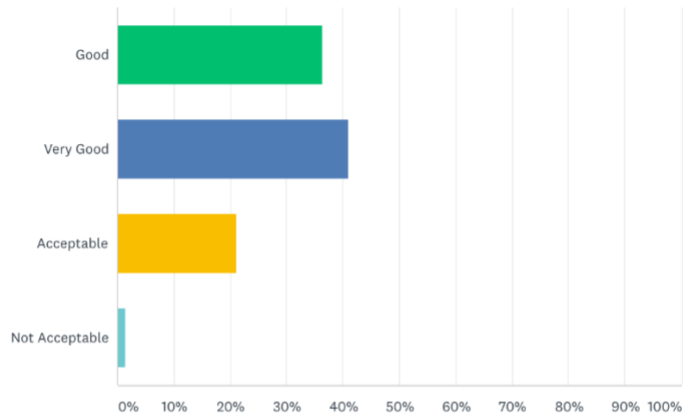


ANSWER CHOICES	RESPONSES
Good	43.94% 29
Very Good	53.03% 35
Acceptable	3.03% 2
Not Acceptable	0.00% 0
Total Respondents: 66	

Participants' perspective on the overall structure of the 4th AfricaLics conference programme

Time allocated to paper presentations and discussions?

Answered: 66 Skipped: 0

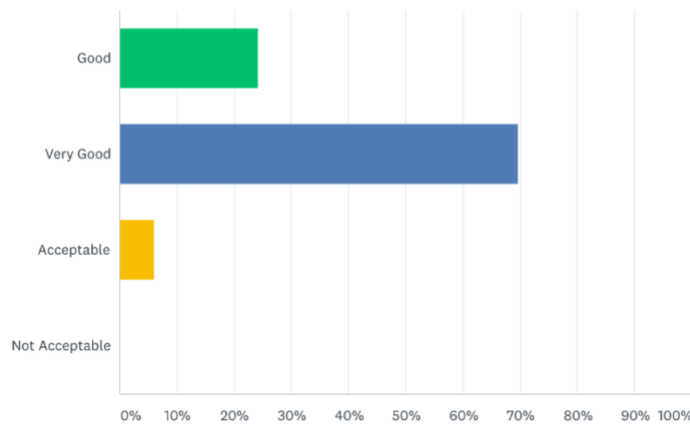


ANSWER CHOICES	RESPONSES
Good	36.36% 24
Very Good	40.91% 27
Acceptable	21.21% 14
Not Acceptable	1.52% 1
Total Respondents: 66	

Participants' perspective on the time allocated to paper presentations and discussions during the 4th AfricaLics conference programme

The relevance of the conference themes chosen?

Answered: 66 Skipped: 0

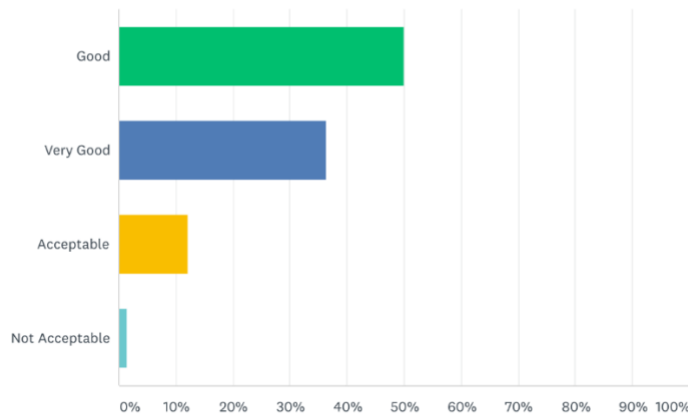


ANSWER CHOICES	RESPONSES
Good	24.24% 16
Very Good	69.70% 46
Acceptable	6.06% 4
Not Acceptable	0.00% 0
Total Respondents: 66	

Participants' perspective on the relevance of the selected themes of the 4th AfricaLics conference.

Approaches used to enhance interaction among conference participants?

Answered: 66 Skipped: 0

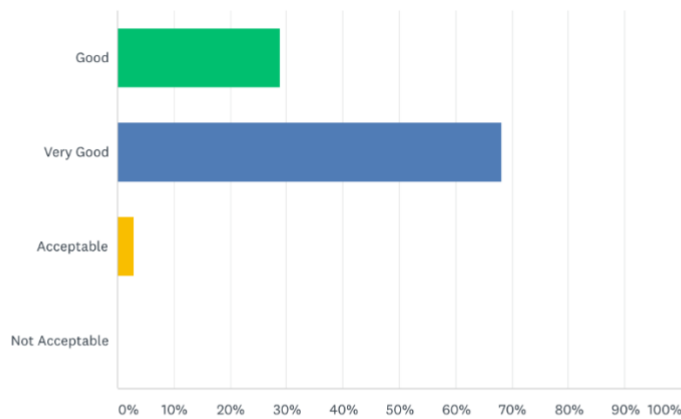


ANSWER CHOICES	RESPONSES
Good	50.00% 33
Very Good	36.36% 24
Acceptable	12.12% 8
Not Acceptable	1.52% 1
Total Respondents: 66	

Participants' perspective on the approaches used to enhance interaction among conference participants during the 4th AfricaLics conference

Overall usefulness of the conference?

Answered: 66 Skipped: 0

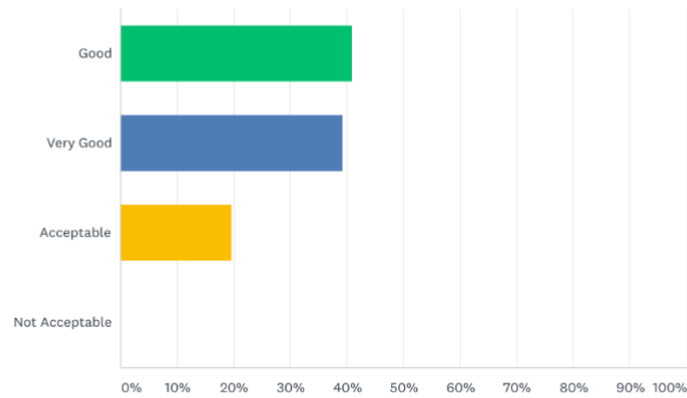


ANSWER CHOICES	RESPONSES
Good	28.79% 19
Very Good	68.18% 45
Acceptable	3.03% 2
Not Acceptable	0.00% 0
Total Respondents: 66	

Participants' perspective on the overall usefulness of the 4th AfricaLics conference

Accommodation, food and conference facilities?

Answered: 66 Skipped: 0

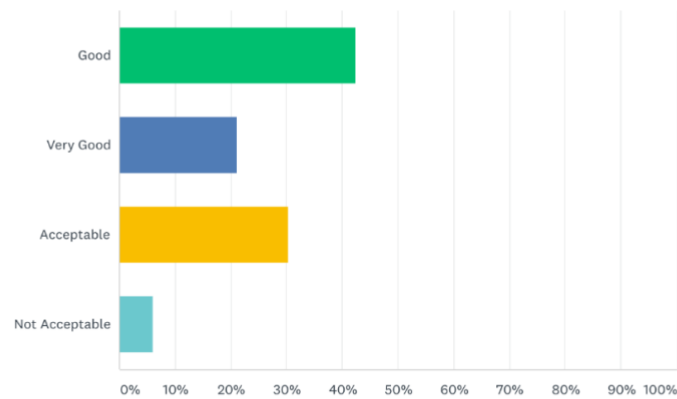


ANSWER CHOICES	RESPONSES
Good	40.91% 27
Very Good	39.39% 26
Acceptable	19.70% 13
Not Acceptable	0.00% 0
Total Respondents: 66	

Participants' perspective on the quality of accommodation, food and conference facilities during the 4th AfricaLics conference

The social activities?

Answered: 66 Skipped: 0

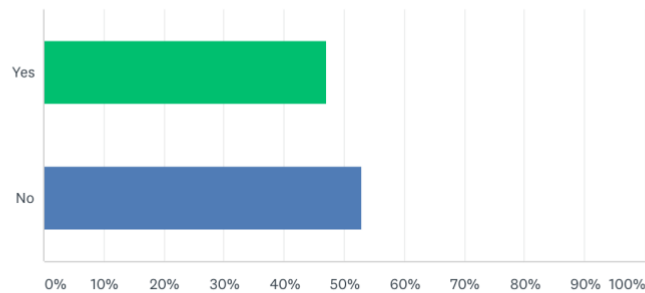


ANSWER CHOICES	RESPONSES
Good	42.42% 28
Very Good	21.21% 14
Acceptable	30.30% 20
Not Acceptable	6.06% 4
Total Respondents: 66	

Participants' perspective on the quality of accommodation, food and conference facilities during the 4th AfricaLics conference

Have you ever attended any AfricaLics organised conference before?

Answered: 66 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	46.97%	31
No	53.03%	35
TOTAL		66

Participants' attendance of previous AfricaLics conferences

A Summary of suggestions for future conference

The following question was posed to the respondents: Any other comments or feedback to the scores given above that we can use to improve the organization of future AfricaLics conferences? The feedback is summarized below.

- Review process can improve in getting more relevant papers for the network. Also, reviewers should be encouraged to provide more pointed and useful feedback to authors in order to improve the papers.
- The event was well organized.
- Discussants to give constructive feedback, which will enable a young scholar to grow and not to mock or shoot a paper presenter in the leg.
- The organization was excellent - the students were extremely helpful and nice. The atmosphere very convivial and supportive. My only complaint is that the guest speakers should have attended some of the conference and, at the very least, had an extensive question time after their talks
- If possible, facilitate more informal interactions between the senior researchers and the younger researchers.
- A well-organized conference. Had good interactions with renowned researchers in the field of innovation and development. So, privileged to be a part of this network. Keep up with the good work.
- It will be nice to include site seeing as part of the socials
- Proximity of conference to accommodation would be better to avoid traffic jam

- Thank you for the privilege to attend the conference
- It was a well-organized conference covering relevant themes.
- It much better to invite delegates from other Tanzanian University to share them some experiences on how to organize such big events.
- It would be good if more thought is given on formats to create a dynamic discussion in the theme session. The session of 'Frugal innovation' with provoking pitches followed by group discussions was welcomed by all participants but a rare occasion. Furthermore, I understood in an earlier version of AfricaLics there had been some seed money to incite researchers on similar themes to elaborate possible joint research in the near future. I am not knowledgeable on the success of this format, but it would strengthen to innovation research network and researcher capacity when such opportunities were offered and evaluated. The whole initiative is a laudable, and all social events are used to network. It would be nice to get this interaction also enhanced in the formal sessions to attain more collaboration after the conference.
- Provision of information to participants continuously during the conference can be improved. Every time there is next event which require movement then clear announcement of what is next is required.
- Very well organized and beneficial conference
- Not sure whether there were social activities but everything else was great.
- I enjoyed the conference very much and got good feedback on my paper. However, the conference needs more interactive thematic sessions. so far, they mostly consist of panelists who speak the most in the thematic session. More interaction in the session would enrich the conference.
- Improve participation of local researchers.
- The mix of plenaries and panels worked well.
- Grant travel support to young researchers residing in high-income countries on a case-by-case basis because they are most often the most financially deprived, whereas they can provide high added value that the conference and the whole of Africa lack.
- I think more time should be allocated to social activities and interactions among participants
- The session venues were far distances from the main venue
- I recommend specifying the time of presentation in advance to participants by the way they will prepare a presentation for only 10-15 m by max and to have the open questions later on from the audience and not to be squeezed in time.
- we need to add some cultural activities in the program like dining local food in a local environment

- Consider more innovative programme design to deepen engagement and avoid conversations that are too siloed.
- Loved the format of the first AfricaLics in Mozambique where we co-generated some content and put forward research proposals. Could this be somehow brought back - at least for one of the conference days? Also, it would have been great to have a local social activity like a tour of the old town or even the campus? Overall, the conference is definitely very well set up and designed and I will attend again in the future.
- Some scholars never had adequate time to participate in all thematic presentations. Change of rooms was a bit confusing.
- More effort regarding publication of papers
- Just to commend the University of Dar-es Salaam for the efficient organization of transport from the Hotel to the Conference Venue. It would have been preferable to have the hotel and conference in close proximity to avoid the inconveniences. A field excursion would have been appreciated
- There is need for improvement on information particularly on logistics generally.
- The number of contributor papers should be increased
- Book presentations should have stronger presence also, posters an exhibition.
- Very good organization
- Program seemed too packed
- The rating on usefulness of conference would have been very good if papers were published being an academic conference
- Obviously, the power failure on the last day made things miserable, but it is understood that it was out of the control of the conference organizers. The balance of plenary, panels, and parallel paper sessions was good. Using the junior discussants was good as well. Did they receive instructions on what to do? Having short comments after each paper seemed to work better than having them all at the end.
- Happy with the way the conference was organized and please keep it up!
- My overall opinion of the conference is very good. The pre-conference communications were very good, and the conference itself was well organized and conducted very well. However, the conference was congested with papers, and there was very limited time for discussions. Furthermore, I wish if half a day was dedicated to sightseeing (I feel this is part of netting the social fabrics of the participants) It also seems that there lacks a balanced participants distribution among the different regions, and many are from a single country - Nigeria (not sure of the exact data).

- The conference was good and very educative.
- How I wish we also had poster presenters.
- Venue for conference and the hotels should be at a closer proximity to avoid logistical problems
- The Conference was well organized. However, the lack of cultural tour in the programme is not too good. In addition, the conference had too many thematic sessions which limited the opportunities for many scholars from Africa to present their papers.
- It is very important to cover the visa fees for the participants starting by the next conference.
- It was an excellent conference. Congratulations to the organizers
- I do not have any regret in my previous ratings for AfricaLics events. This is another one that is exceptional. I give kudos to the organizers, first to the secretariat for useful correspondences including information to facilitate visa processing. I also appreciate the effort of the LOC for a job well done. There can be no success without the will of the AfricaLics board as well as the parent board and sponsors. I personally appreciate the contributions and selfless service. Next time, improving on social activities will add more color to the event. My initial thought was that we were going to visit Kilimanjaro being in Tanzania, until I got to know that there was not going to be such tours. Although I am aware that finance may be a constraint; considering the number of attendees. In the overall, I give a grading of 95% to the entire AfricaLics conference 2019. Please do not relent on the effort
- Encourage participants to contribute to blogs and running social media postings during the conference; logistics became problematic, but this is marginal! Blog and social media postings on the substance of sessions will enable deeper conversations around fundamental issues the sessions could not focus due to limited time! Presenters must receive stricter guidelines in order for them to provoke critical knowledge exchanges rather than just dump information in 20-25 minutes.
- Improve on social aspect especially introduction of tourism of participants
- More interactive breakout sessions. Rather than presenters making presentations. We should have debates; the conference is a melting pot of different countries we should seize that advantage to discuss issues interactively not only on a presentation/ critique basis. We should have debates and rapporteurs and develop policy briefs from some sessions especially (Thematic sessions)
- Thanks for a great conference. You did a wonderful job
- The conference was a memorable and remarkable one. However, would kindly suggest that a day be dedicated to visit to historic sites within the

country in which future conferences would hold. Thanks to AfricaLics and their collaborators for the wonderful event. It was worthwhile.

- It's good to have clarity on information. Especially on food, accommodation and airport transfers.
- Keep it up
- To have more time for discussing research papers.
- Maintain the standards of the conference
- Time should have been allocated for cultural tours. Day 3 was too monotonous with special and plenary sessions. It could have been interspersed with some paper sessions.

10. Funding and budget

Item	Total Cost US\$
Travel - paper presenters/ facilitators, AS & ASB members (tickets)	48,821.63
Accommodation (facilitators, papers presenters, AS and ASB members comprising of dinner, bed and breakfast, Lunch, refreshments)	45,900.76
Conference venue	2,648.74
Miscellaneous expenditure (conference management system, taxi/bus hire, printing etc.)	8,543.58
Total	105,914.71

In kind contribution by the co-hosts - STIPRO, COSTECH and UDSM.

This has not been valued in monetary terms.

- Programme and book of abstracts printing, conference bags and banners etc
- Students volunteers to assist with various aspects of the conference (video conferencing and other audio-visual equipment, guiding participants, registration etc.)
- Facilitated police escort.

11. Annexes

11.1 Annex 1: Concept for the 4th conference

This guided in the overall organization of the conference.

The African network of researchers in learning, innovation and competence building systems (AfricaLics) has over the years aimed to hold a research conference on a bi-annual basis since the launch of the network in 2012. The focus is primarily the current state of research on African Innovation and Development specifically for the academic community, but also targeting policy makers and business community.

The 4th AfricaLics conference was held at the opportune time as the African economies seem to hit a crossroad regarding directionality of their innovation policies to attain sustainable development: On the one hand economic growth is paramount to ensuring the livelihoods of Africa's rapidly increasing population. On the other hand, climatic, environmental and social challenges are calling for development models considering these. The 'old' growth models related to a narrow perception of (technological) innovation as a key driver for economic growth are increasingly being criticized not only for being narrowly focused, but also for producing undesirable environmental and social effects, including climate change and excessive socio-economic inequalities.

Many scholars from the Globelics and AfricaLics communities have long advocated that a broad perception of innovation and the development of capabilities in national, sectoral and technological innovation systems are key elements in ensuring the structural transformation processes that Africa requires. Some of these scholars have further argued that innovation should be shaped and directed in favor of socially inclusive and environmentally sustainable development. In other words, an excessive focus on economic outcomes of innovation, and on innovation policies directed mainly at promoting economic growth, will not bring about the required change neither in Africa, nor on a global scale. Meanwhile other academic and policy-oriented communities such as the TIPC (Transformative Innovation Policy Consortium) have also induced some alternative understandings and definition of innovation frames and policy directions. The proponents of this concept argue that, while growth-based innovation models that evolved after World War II remain relevant, they offer little guidance for managing the substantial negative consequences of the socio-technical system of modern economic growth. The transformative innovation policy frame is currently

being experimented, with major focus on the hypothesis that the *Global South* does not need to imitate the economic transformation model of the *Global North*. However, while academic and policy discourses seem to be taking a new turn in the history of innovation - a turn away from emphasis on increasing productivity and growth issues - the African continent is at the height of its growth debate.

At the center of this debate is the role that Science, Technology and Innovation should play in shaping the future of African Countries. Such debates are very crucial for the African region that hosts more than half of the least developed countries in the world; and which will (according to the UN) see its population doubling to 2.4 billion people by 2050. There is already a consensus that the kind of growth required must involve value addition to the continent's abundant natural resources, including its agricultural produces and medicinal plants. This consensus is clearly articulated in the African Union's Plan of Action for the Accelerated Industrial Development of Africa (AIDA) and Agenda 2063 - the African Union's strategic framework for the socio-economic transformation of Africa. At the global level, this is at the heart of Goals 8 &9 of the Sustainable Development Goals (SDGs). At the center of these regional and global plans is a broad understanding of innovation and the need for development of capabilities, which can help foster sustainable industrialization and development in a manner that respects the planetary boundaries. This means that appreciating the challenges brought about by the growth-focused innovation models, Africa cannot escape discussions regarding how to combine the need for economic growth with the need for more environmentally and socially sustainable developments paths. It also raises key questions as: How can the Innovation and Development community help to further develop concepts and strategies that deal with this challenge building on research and activities conducted within the past 10 years? What research questions, theories and methods will it take?

Conference theme and sub-themes

The 4th AfricaLics conference aimed at addressing some of the above raised questions. Answers to such questions are of interest, not only to Africa, but also the global development community - in the spirit of the SDGs of *leaving no one behind*. The main theme of the conference was: **Innovation and transformative capacities for growth and sustainable development in Africa**. Papers addressing the main theme and sub-themes (see below) were strongly encouraged, but other high-quality papers focusing on innovation and development issues were also accepted.

Sub-themes

- a) Appropriate policies for innovation and development in the era of Science, Technology and Innovation Strategy for Africa (STISA), 2024, Agenda 2063 and the SDGs
- b) Innovation, the Private Sector and Sustainable Development - the future of formal and informal economies
- c) Innovation management in key economic sectors for Africa's development (e.g. agriculture, manufacturing, services): prospects and challenges
- d) 4th Industrial Revolution: Opportunities and impacts of disruptive technologies on African social and economic structures
- e) Ensuring sustainable development through innovation - focusing attention on natural resources management, energy and climate change
- f) Challenges in and innovation for sustainable education, health and human wellbeing in Africa
- g) Ensuring inclusive innovation and development - focusing attention on gender, youth and persons with disabilities

Conference location and objectives

The 4th AfricaLics Conference was hosted by STIPRO in collaboration with UDSM and COSTECH.

The conference intended to bring together up to 120 - 200 PhD students, early careers and established researchers and scholars from different disciplines with the overall aim of enhancing the quality of innovation studies in relation to development and growth in Africa. The conference specifically aimed at providing a space for presentation and discussion of research findings and for networking between researchers working in the field of innovation and development. It constituted part of the AfricaLics efforts to build research capacity in Africa with strong links to users including policy makers and the private sector.

The main objectives of this conference were:

- To present and discuss state of the art research in the field of innovation and development in Africa with focus on the promotion of sustainable industrialization.
- To provide a much-needed arena for researchers in Africa, particularly early career researchers, to build capacity in presenting and networking skills as well as learning about new methods and theories.
- To promote networking and create space for new collaborations amongst researchers in the field of innovation and development focusing on Africa.
- To build capacity to teach high quality, fit for purpose, curricula in the field of innovation and development in Africa.

The conference was held over three days. The first and the second days involved keynotes addresses and presentation of research papers in parallel tracks with panel discussions and plenary lectures. The third day was devoted to learning and networking through workshops and collaborative research facilitation events including a teaching track on innovation and development.

Timeline for organization

Submission of papers and registration	1 st May 2019
Deadline for submission of papers	1 st June 2019
Notification of paper acceptance	Before the end of July 2019
Deadline for application for travel support	1 st June 2019
Response to applicants for travel support	1 st August 2019
Conference registration deadline	4 th October 2019
Deadline for up-loading of final paper	10 th October 2019

11.2 Annex 2: Conference Programme

CONFERENCE DAY 1 - Tuesday 22nd October 2019

TIME	ACTIVITY
7:30	Departure from the Hotels
8:30 - 9:00	Arrival and registration (<i>for those who didn't register at the hotel on 21st October</i>)
9:00 - 9:10	Welcome remarks by Vice Chancellor of University of Dar es Salaam (UDSM)
9:10 - 10:15	<p>OFFICIAL OPENING SESSION</p> <ul style="list-style-type: none"> ▪ Chair of AfricaLics, Dr. Bitrina Diyamett ▪ Director General of the Commission for Science, Technology and Innovation (COSTECH) ▪ Swedish International Development Cooperation Agency (Sida), Tanzania <p>Opening address - Minister of Industry, Trade and Investment, United Republic of Tanzania</p>
10:15 - 11:00	<p>KEYNOTE ADDRESS 1: Industrialization and Sustainable Development - the Tanzanian Perspective</p> <p>Prof. Samuel Wangwe, Principal Research Associate, Economic and Social Research Foundation, Dar es Salaam, Tanzania.</p>

	<p>Prof. Wangwe is a globally respected economist with a long-term and diverse track record working with industrialization processes - both academically and policy wise, in and outside Tanzania. Prof. Wangwe has done both research, consultancies and policy advice to the Tanzanian government.</p>
<p>11:00 - 11:30</p>	<p>Break and Group Photo session</p>
<p>11:30 - 13:00</p>	<p>PAPER PARALLEL SESSION A PAPER SESSION A1: INCLUSIVE INNOVATION Chair: Susan Cozzens Discussant: Opeyemi Eytayo Ayinde Location: B 100</p> <ul style="list-style-type: none"> ▪ Towards an indicator of R&D and inclusive human development. <u>Glenda Kruss, Moses Sithole, Yasser Buchana</u> ▪ A Longitudinal Assessment of Nigeria's Research Output for Evidence Based Science Policy Development. <u>Olufikayo Opemipo Abodunde, Oluseye Jegede, Timothy Oyebisi</u> ▪ Informal Sector Measurement of Openness, Collaboration and Innovation in Africa: The case of Otigba Hardware Microenterprises Cluster in Africa. <u>Oluseye Oladayo Jegede, Olubukola Esther Jegede, Nazeem Mustapha</u> <p>PAPER SESSION A2: TRANSFORMATIVE INNOVATION Chair: Mammo Muchie Discussant: Michael Ejime Ikehi Location: B 106</p> <ul style="list-style-type: none"> ▪ Building human capacity for innovation and sustainable growth of firms in Africa: the case of returnee entrepreneurs in technology SME clusters in Nairobi, Kenya. <u>Pamela Adhiambo Mreji</u> ▪ Managing sustainable innovation in the organization: the role of workers' autonomy and knowledge management <u>Waliu Mulero Adegbite</u> ▪ Social networks and diffusion of agricultural innovations: The case of sericulture in South India <u>Rajesh Gopalakrishnan Nair</u>

PAPER SESSION A3: AGRICULTURAL INNOVATION SYSTEMS

Chair: George Essegbey

Discussant: Namrata Thapa

Location: B 318

- **Do Innovations and the Interactions in the Agricultural Innovation System (AIS) Serve as a Conduit for Improving Productivity and Technical Efficiency of Farmers in Ghana?**
Justina Adwoa Onumah, Felix Ankomah Asante, Robert Darko Osei
- **Innovating for Climate Change Adaptation: An Agricultural Innovations Systems Approach in Zimbabwe.**
Mclarence Shungu Mandaza
- **Innovation and policy learning: Insights from the Agriculture Innovation System in Rwanda.**
Parfait Yongabo, Devrim Göktepe-Hultén

PAPER SESSION A4: TECHNOLOGY AND INNOVATION

Chair: Ogundiran Soumonni

Discussant: Sunday Olufemi Akintelu

Location: B 423

- **Open Innovation System, Absorptive Capacities and Sustainable Economic Growth in Africa.**
Bernadin Geraud Comlan Ahodode, Henri Ngoa Tabi
- **Biometric Technologies and the Prospect for Sustainable Democracy in Africa**
Harrison Adewale Idowu
- **Microenterprises and local taxation in Benin: Proposition of an innovative model for a double performance**
Babarinde Rene Aderomou

PAPER SESSION A5: STI: UNIVERSITY PERSPECTIVES

Chair: Alexandre Vera-Cruz

Discussant: Gussai Hamror Sheikheldin

Location: Library Lounge

- **Towards Achieving SDG 4: Prospect of Google Classroom as an Innovative Approach to Instructional Delivery for a Nigerian University.**
Jumoke Iyabode Oladele, Olawale S. Koledafe, Dorcas Sola Daramola, Helen Bidemi Victor-Akinyemi

	<ul style="list-style-type: none"> ▪ Personal Information Creation, Storage and Finding/Re-finding Behaviors of Faculty in Selected Universities in Ghana. <i>Antonia Bernadette Donkor</i> ▪ Retaining academic staff in higher education: the challenges confronting two public universities in Ethiopia. <i>Zelalem Bayisa Gurmessa</i>
13:00 - 14:15	Lunch Break
14:15 - 15:00	<p>KEYNOTE ADDRESS 2: Open Innovation: Lessons from China and relevance for Sustainable Development in Africa</p> <p>Prof. Xiaolan Fu, Professor of Technology and International Development, University of Oxford, UK.</p> <p>Prof. Fu is an outstanding international scholar in the field of innovation and development. She is a member of the Ten-Member High Level Advisory Group of the UN Technology Facilitation Mechanism and of the Governing Council of the UN's Technology Bank for Least Developed Countries. She is also a member of the UN SDSN Leadership Council led by Jeffrey Sachs and a member of the Council for Global Economic Transformation co-chaired by Joseph Stiglitz and Michael Spence. Her research interests include innovation, technology and industrialization; trade, foreign direct investment and economic development; emerging Asian economies; innovation and productivity in the UK/US.</p> <p>Moderator: Dr. George Essegbey - STEPRI, Ghana</p>
15:00 - 15:15	Break
15:15 - 16:45	<p>PAPER PARALLEL SESSION B</p> <p>PAPER SESSION B1: INCLUSIVE INNOVATION</p> <p>Chair: Geci Karuri-Sebina</p> <p>Discussant: Pamela Adhiambo Mreji</p> <p>Location: B 100</p> <ul style="list-style-type: none"> ▪ Towards a framework for evaluating innovation for inclusive development performance: a systematic review <i>Adedamola David Adeyeye, Sara S. Grobbelaar</i> ▪ Inclusive innovation: Contrasting theoretical framings with the framing by agricultural practitioners in Kenya <i>Felix Ouko Opola, Laurens Klerkx, Cees Leeuwis, Catherine Kilelu</i> ▪ The dynamics of STI policy formulation in Africa: the case of Ghana

George Owusu Essegbey, Adelaide Asante

PAPER SESSION B2: TRANSFORMATIVE INNOVATION

Chair: Abdelkader Djeflat

Discussant: Gregory Mvogo

Location: B 106

- **Le management des compétences dans les pme innovantes: étude de cas au sein du secteur vitivinicole au Liban**
Hadia Baassiry
- **Innovation and the performance of informal micro, small and medium-scaled enterprises (MSMEs) in Ghana: A gender perspective**
Elvis Koroku Avenyo, Erika Kraemer-Mbula
- **Technological Innovation and Export Performance of Firms in Nigeria: an empirical analysis of manufacturing SMEs**
Mirabel Godswill Omoruyi, Caleb Muyiwa Adelewo

PAPER SESSION B3: AGRICULTURAL INNOVATION SYSTEMS

Chair: Daniel Kitaw

Discussant: Rajesh Gopalakrishnan Nair

Location: B 318

- **Regional and Technological Heterogeneity in Productive Performance among Cassava Processors in Ghana.**
Gifty Boakye Appiah, Robert Aidoo, Kwasi Ohene Yankyera
- **Innovation as a configuration that works: the case of dairy development in East Africa.**
Joel Onyango
- **Technological capability assessment of rice processing industry in Nigeria.**
Sunday Olufemi Akintelu, Titilayo Olubunmi Olaposi, Joshua Babatunde Akarakiri

PAPER SESSION B4: TECHNOLOGY AND INNOVATION

Chair: Lourenço G. D. Faria

Discussant: Adeyemi Oluwaseun Adepoju

Location: B 423

- **Adoption of Renewable Energy Technology by Rural Farming Households in Nigeria: Impact and Drivers.**
Toyin Benedict Ajibade, Taiwo Ezekiel Ajibade, Abdulazeez Muhammad-Lawal, Waliyat Olaide Oloyede

	<ul style="list-style-type: none"> ▪ Determinants of mobile phone-based electronic wallet technology adoption among young farmers in Nigeria. <i>Adeola Oloyede, Opeyemi Ayinde</i> ▪ Analysis of factor affecting willingness-to-pay for egg powdered innovation among consumers in Ilorin metropolis, Kwara state, Nigeria. <i>Opeyemi Eyitayo Ayinde, Seun Ayodele Adetayo, Oluwatosin Temidayu Ogundele, Kayode Ayinde</i> <p>PAPER SESSION B5: STI: UNIVERSITY PERSPECTIVES Chair: David Kaplan Discussant: Kgabo Ramoroka Location: Library Lounge</p> <ul style="list-style-type: none"> ▪ University Internship Systems and Preparation of Young People for World of Work in the 4th Industrial Revolution. <i>Oluyemi Adeosun, Ayodele Shittu</i> ▪ Unlocking students' innovation potentials: the case of engineering students in Tanzanian Universities. <i>Juliana Zawadi Machuve</i> ▪ Agriculture and Entrepreneurship Aspirations among University Students in Nigeria; A Call for Innovative and Transformative Approach in Pedagogy <i>Michael Ejime Ikehi</i>
16:45 - 17:30	Book presentations and announcements + time for informal meetings
17.45	Buses leave for the hotel
19:00 - 21:30	Welcome Reception - Hotel Seascape and Conference Centre

CONFERENCE DAY 2 - Wednesday 23rd OCTOBER 2019

TIME	ACTIVITY
7:30	Departure from the Hotels
9:00 - 10:15	PLENARY SESSION

	<p><i>Developing post-graduate studies and increasing capacity in research on Innovation and Development: Rationale, Good practices and ways forward?</i></p> <p>This panel session will feature brief kick-off interventions by representatives of research capacity building networks followed by an open Q&A session.</p> <p>Speakers: Dr. Florah Karimi, CARTA and Prof. Mammo Muchie, Tshwane University of Technology</p> <p>Key questions</p> <ul style="list-style-type: none"> ▪ How can enhanced research capacity in research on Innovation and Development help ensure more innovation in Africa and thereby help support implementation of the Sustainable Development Goals? ▪ What is the experience with joint add-on joint activities compared to integrating PhD programmes at African universities? ▪ What types of support are required and where should PhD students and early career fellows go to get the input they require? ▪ What should be the role of South-South collaboration vs. South-North collaboration? ▪ What role can mentoring (on-line, face-to-face etc.) play in building up research capacity?
10:15 - 10:45	Tea Break
10:45 - 11:30	<p>KEYNOTE ADDRESS 3: The Role of Universities in Transformation and Sustainable Development in Africa</p> <p>Dr. Glenda Kruss, Chief Research Scientist, Human Sciences Research Council (HSRC), South Africa</p> <p>Dr. Kruss is the Deputy Executive Director of the Centre for Science, Technology and Innovation Indicators at the HSRC. Over the past ten years, she has worked in the field of innovation studies to understand the role of universities and public research institutes in economic and social development, and the determinants of skills and knowledge flows. Her current work is oriented towards more contextually appropriate measures of STI for inclusive and sustainable development in Africa.</p>

	Moderator: Prof. Susan Cozzens - Georgia Institute of Technology, USA.
11.30 - 11.35	Break
11:35 - 13:05	<p>PAPER PARALLEL SESSION C PAPER SESSION C1: INCLUSIVE INNOVATION Chair: Ogundiran Soumonni Discussant: Elvis Kor'ku Avenyo Location: B 100</p> <ul style="list-style-type: none"> ▪ Forms of Exclusion/Inclusion in the Innovation Process - An Analysis of Access of Small Growers to Formal Institutional Arrangements in Tea and Natural Rubber Plantations in India. <u>Namrata Thapa</u> ▪ Inclusive innovation? A comparative analysis of Public Private Partnership and Innovation Platforms in agriculture, Ghana. <u>Annemarie van Paassen, Charity Osei-Amponsah, George Essegbey</u> ▪ Inviting innovation for industrialization: Public technology intermediaries in Tanzania <u>Gussai Hamror Sheikheldin</u> <p>PAPER SESSION C2: TRANSFORMATIVE INNOVATION Chair: Daniel Kitaw Discussant: Hezron Makundi Location: B 106</p> <ul style="list-style-type: none"> ▪ Node between Firm's Knowledge-intensive Activities and their Propensity to Innovate: insights from Nigeria's Mining Industry. <u>Bolanle Eyiwumi Adewusi, Oluseye Oladayo Jegede</u> ▪ Local Content Development in Tanzania: A Case of Determinants of Technological Capability Building among Selected Contractors in the Construction Industry <u>Musambya Mutambala</u> ▪ Production Characteristics of Innovative Firms in Nigeria's ICT Clusters <u>Awoleye, Olusesan Michael</u>

PAPER SESSION C3: AGRICULTURAL INNOVATION SYSTEMS

Chair: Geci Karuri-Sebina

Discussant: Gifty Boakye Appiah

Location: B 318

- **Agricultural productivity growth in Central African countries: evidence of technological innovation and efficiency gaps.**

Ajapnwa Akamin, Ernest L. Molua

- **Associations between intensification interventions and negative externalities in smallholder dairy farms in the Kenyan Highlands.**

Fredrick Agutu, James Ondiek, Bockline Bebe

- **Enhancing capacity for uptake of system of rice intensification (SRI) practices through an innovation platform among smallholder rice farmers in Oluch irrigation scheme, Homabay county, Kenya.**

Matilda Auma Ouma

PAPER SESSION C4: TECHNOLOGY AND INNOVATION

Chair: Edward Lorenz

Discussant: Lotta Takala-Greenish

Location: B 423

- **Fourth Industrial Revolution: Opportunities and Impacts of Disruptive Technologies on African Innovative Systems, Social and Economic Developments.**

Manir Abdullahi Kamba

- **The Fourth Industrial Revolution: Technologies and Implications for Developing Countries.**

Babatunde Adetunji Aodu, Abiodun A. Egbetokun

- **The Disruptive Potential of Frugal Innovations in Electricity and Weather Monitoring: Low Cost Alternatives or Expensive Stop Gap Solutions?**

Howell, Rachel Jean-Boeger, Peter Knorringa, Neelke Doorn, Cees van Beers

PAPER SESSION C5: SUSTAINABILITY AND INNOVATION

Chair: Rasmus Lema

Discussant: Joel Onyango

Location: Library Lounge

	<ul style="list-style-type: none"> ▪ The Green Economy and Economic Development - trends in the greening of Kenyan Companies. <i>Maj M. Andersen, Erick Ogallo, Lourenço G. D. Faria</i> ▪ Energy costs, technical performance and innovations: an analysis of the sustainability of firms in Togo. <i>Kossi Messanh Agbekponou</i> ▪ Framework for Technological Capability Building in the Nigerian Solar Energy Industry Using Structural Equation Modelling. <i>Adeyemi Oluwaseun Adepoju</i>
13:05 - 14:15	Lunch Break
14:15 - 15:45	<p>THEMATIC SESSION A</p> <p>Thematic session 1: Innovation in renewable electrification: the case of capability building through renewable electrification projects in Kenya Organizer: Aalborg University Denmark Location: B 100</p> <p>Renewable electrification is a key building block for economic development as countries reassess their use of carbon fuels as a result of climate change debates. Ghana and Kenya currently produce around 50% of its electrification needs using renewable sources (wind, solar, hydropower and geothermal). As countries reassess their efforts to move towards greener energy sources, it is important to ask if such activities have the opportunity to provide spillovers into other areas of a country's economic development activities. Specifically, can renewable electrification projects create opportunities for new job creation, new skills or new product development leading to enhanced local manufacturing or industrialization efforts in a sustainable way? What is the role of learning, innovation policies including local content requirement in the path to sustainable industrialization?</p> <p>This thematic session will consist of a moderated panel session with a number of speakers who are involved in researching these issues from a number of different African countries including Kenya. After short presentations, the session will be opened up for discussion from the wider audience.</p>

Panelists

- Rasmus Lema - Aalborg University, Denmark
- Rebecca Hanlin - ACTS/AfricaLics Secretariat, Kenya
- Charles Nzila - Moi University, Kenya
- Michael Korir - Moi University, Kenya
- Ann Kingiri - ACTS/AfricaLics Secretariat, Kenya
- Faith Odongo - Ministry of Energy, Kenya

Thematic session 2: Agricultural Innovation Systems: Identifying inclusive Agricultural Innovation configurations for growth and sustainable development

Organizer: Wageningen University and Research (WUR), Netherlands

Location: B 106

The last century is known for unprecedented strides in growth and development aided by Science, Technology and Innovation (STI). Yet, two-thirds of the global poor are "the rural and the agricultural" and remain as outliers of development driven by innovation. Hence the challenge of innovating out of global poverty and inequality and achieving inclusive and sustainable development calls for "transforming traditional agriculture" - an issue of much concern for development economists for a long time. The Agricultural Innovation System (AIS), a derivative of innovation system perspective, attributes the backwardness of agricultural sector to the absence of systems that facilitates interactive learning, innovation and competence building among the various actors involved. Hence agricultural transformation calls for building systems that facilitates, among others, technological, organizational and institutional innovations in the varied spheres of agriculture relating to research, extension, production, processing, marketing, trade and other activities. New forms of innovation need to be explored, that are able to simultaneously align the economic, social and environmental challenges. While there is heightened concern over evolving sustainability oriented agricultural innovation systems and greater orientation towards organic production, one cannot afford to ignore that the externalities of agriculture by nature are different from that of industrial sector.

Addressing these issues calls for vibrant inclusive, experimental innovation processes, guided by social and environmental objectives, which inspire public debate, societal learning, assessment and

transformation. This in mind, this session will convene a number of experts who have studied the role of existing and new actors in brokering agricultural innovation, such as farmer communities, Producer Boards, multinational and local companies, Public-Private Partnerships, Innovation Platforms, and social entrepreneurs.

Aim of the session is to jointly reflect on the following questions:

- What (configuration of) actors are able to really engage local smallholders in active innovation deliberation, experimentation to effectively tackle their economic and environmental challenges?
- For what type of crop and value chain contexts is such an innovation configuration able to perform?
- What type of public debate, societal learning may it evoke?
- What type of policy practice is needed to enhance such innovation configurations to emerge and perform?

Panelists

- Annemarie van Paassen - Wageningen University and Research (WUR), Netherlands (Moderator)
- Catherine Kilelu - ACTS, Kenya
- Gerald Katothya - JKUAT, Kenya
- Justine Adwoa Onuma- STEPRI, Ghana
- Thapa Namrata- Institute of Economic Growth, India
- Kgabo Ramoroka - Wits Business School, South Africa

Thematic session 3: The role of the state in supporting innovation for inclusive transformation

Organizers: Centre for Science, Technology and Innovation Indicators (CeSTII), Human Sciences Research Council, South Africa

Location: B 318

One of the main challenges hindering the eradicating of poverty by 2030 is the concentration of poverty in many rural areas of developing countries. In those areas, entire communities are still engaged in low-productivity production systems at the margin of the mainstream economic system. Confronting these challenges requires bold measures to accelerate rural transformation in order to modernize production systems and increase the participation of rural communities in national and global economic systems. With the global emergence of disruptive technologies typified as a 'fourth industrial revolution', successful rural transformation requires the

	<p>deployment of innovative solutions directed to broadening the rural production base, from traditional activities into more productive sectors that enable members of rural communities to enhance their livelihoods and wellbeing. Rural transformation is to be achieved through a process that involves novel inclusive approaches to innovation that give more space to rural community members to take active part in shaping solutions to the problems they face.</p> <p>Transformative innovations that confront big challenges have rarely been the result of market forces left alone. The active involvement of the state as a driver and enabler of rural transformation, is essential in coordinating, guiding and supporting the acquisition and expansion of capabilities and resources, to shape rural transformation.</p> <p>This panel discussion aims to broaden our understanding of the role of the state in supporting structural transformation. By using the leverage derived from its economic and political powers, the state can indeed foster capacity building and provide incentives for the necessary innovations that give impetus to the needed rural transformation.</p> <p>Panel composition:</p> <ul style="list-style-type: none"> ▪ Alexis Habiyaremye - HSRC, South Africa: Moderator ▪ Glenda Kruss - CeSTII, HSRC, South Africa ▪ Abdelkader Djeflat - Université de Lille, Algeria ▪ Peter Terrance Jacobs - HSRC, South Africa
15:45 - 16:00	Tea/Health break
16:00 - 17:30	<p>PAPER PARALLEL SESSION D PAPER SESSION D1: INCLUSIVE INNOVATION Chair: Catherine Kilelu Discussant: Oluseye Jegede Location: B 100</p> <ul style="list-style-type: none"> ▪ The Role of Grassroot Community-Based Organizations in the Rehabilitation of degraded Communal Drylands in the Njemps Flats, Kenya. Rebecca Njoki Karaya Kigwa ▪ The role of trademarks in empowering rural women through their traditional knowledge: The case of Nigeria.

Ofonmbuk Esther Ekong

- **Gender Dynamics in Agricultural Innovation Systems in Zimbabwe. Implications for Policy.**

Faith Kurete

PAPER SESSION D2: TRANSFORMATIVE INNOVATION

Chair: Julius Gatune

Discussant: Peter Terrance Jacobs

Location: B 106

- **Innovation, Technology, Economic Growth and Development in Tanzania.**

Jimmy Alani

- **How market-led agricultural advisory services support innovation in the Kenyan agri-food sectors: An innovation ecosystem perspective.**

Catherine Kilelu, Gerald Katothya

- **The impact of export promotion policy strategies in the Ethiopian manufacturing sector: Implications for the prospect of building local manufacturing capability.**

Abdi Ahmad, Moges Tufa Adinew

PAPER SESSION D3: AGRICULTURAL INNOVATION SYSTEMS

Chair: David Kaplan

Discussant: Alexis Habiyaremye

Location: B 318

- **Infrastructural Development, Sustainable Agricultural Output and Employment in ECOWAS Countries.**

Richardson Kojo Edeme, Janefrancis C Idenyi

- **Effects of training design and trainee characteristics on transfer of agronomic training among small scale farmers under a bean innovation platform in Uganda.**

Joseph Kiwanuka, Richard Miiro

- **Effect of Rural-Urban Migration on Cocoa Production Sustainability in Ondo State, Nigeria.**

Oluwatosin Temitayo Ogundele, Adeniyi Emanueal Adejuyigbe, Opeyemi Eytayo Ayinde, Ibukun James Olaoye, Oluwasegun Tope Fabiyi

PAPER SESSION D4: TECHNOLOGY AND INNOVATION

Chair: Olusesan Michael Awoleye

Discussant: Rebecca Hanlin

	<p>Location: B 423</p> <ul style="list-style-type: none"> ▪ Drivers of Biomedical Engineering Services among Teaching Hospitals in Southwestern Nigeria. <i>Olaniyi Oluwaseun Oluyide</i> ▪ The National Strategy against obesity and diabetes in Mexico: obstacles to the success of projects guided by a mission. <i>Alexandre Vera-Cruz</i> ▪ Frugal Business Model Innovation in Healthcare: The Case of Philips Community Life Centres. <i>Elsie K. Onsongo, Peter Knorringa, Cees van Beers</i> <p>PAPER SESSION D5 : TRANSFORMATIVE INNOVATION Chair : Mammo Muchie Discussant: Rajesh Gopalakrishnan Nair Location: Library Lounge</p> <ul style="list-style-type: none"> ▪ Transforming Algeria's Rural Areas through STI and the Knowledge Economy: The Proximity Programme for Integrated Rural Development (PPDRI). <i>Abdelkader Djeflat</i> ▪ The patterns of innovation process by the rural based enterprises: Mapping rural innovation value chains in rural South Africa. <i>Ramoroka Kgabo</i> ▪ Exploring the challenges for regional industrial development through the case study of soy agro-processing in South Africa, Zambia and Zimbabwe <i>Lotta Takala - Greenish</i>
17:30	Buses leave for hotel
19:00 - 21:30	Conference dinner at Whitesands Hotel

CONFERENCE DAY 3 - Thursday 24th OCTOBER 2019

TIME	ACTIVITY
7:30	Departure from the Hotels
9:00 - 10:30	Plenary session:

	<p><i>Teaching and Learning Innovation & Development: challenges and good practices.</i> Presentations on the challenges and opportunities of teaching Innovation and Development courses at African universities followed by an open Q&A</p> <p>Speakers: Mona Lisa Dahms - Aalborg University, Japhet Maingu Makongo - Ubunifu Associates and Ogundiran Soumonni- Wits Business school</p> <p>Key questions.</p> <ul style="list-style-type: none"> ▪ What are the key challenges in teaching Innovation and Development studies in Africa? ▪ What lessons have you learned from the I&D programmes you are involved in and how may these inform future initiatives?
10:30 - 11:00	Tea /Health break
11:00 - 12:30	<p>Thematic session B</p> <p>Thematic session 1: Towards a transformative innovation policy research agenda: Perspectives from African contexts for a continuing internetwork dialogue</p> <p>Organizers: Transformative Innovation Policy Consortium (TIPC)</p> <p>Location: B 100</p> <p>Background</p> <p>The need to align the capacities of societies to innovate in response to the grand challenges they face is increasingly recognized amongst researchers and policymakers. Implied perhaps most strongly in the sustainable development goals (SDGs), meeting these grand challenges means the mobilization of innovation policies across a wide and diverse range of areas that, taken together, suggest a demand for widespread transformations in the innovation systems underpinning the functioning of societies across the world.</p> <p>Transformative innovation policy</p> <p>The recognition of grand challenges and the implications of the SDGs have stimulated the emergence of a discourse on "Transformative Innovation Policy" (TIP), advocating for transformative change in the rationales, instruments, indicators and governance of science, technology and innovation (STI) systems. To</p>

realize these transformative changes needs, amongst others, development of an accompanying field of research and practice. In trying to address this need, four research and practice communities have been engaged in an ongoing internetwork dialogue to build a shared research agenda:

- European Forum for Studies of Policies for Research and Innovation (Eu-SPRI)
- Sustainability transitions research network (STRN)
- Transformative Innovation Policy Consortium (TIPC)
- Global Network for Economics of Learning, Innovation, and Competence Building Systems (Globelics)

Panel session

In this session, we will explore how emerging understandings of TIP may help devise novel approaches to the funding and conduct of STI policy thus contributing to the timely achievement of ambitious international commitments to sustainable development. But, crucially, the conversation will center around the more specific needs prevalent in African contexts:

- What do insights arising from African development challenges mean for TIP?
- How do we develop a shared research and practice agenda across the four communities listed above while responding to context-specific needs in African settings?

In eliciting insights from the AfricaLics community, the internetwork dialogue hopes to continue the conversation between the abovementioned networks, policymakers and research funders, building a constituency that could help foster a new generation of innovation policies that are more suitable to addressing contemporary challenges.

The session will include a brief presentation on the internetwork dialogue on TIP, followed by a chaired panel discussion followed by an open discussion from the audience.

Panelist:

- Rob Byrne - University of Sussex, UK (Chair/Moderator)
- Ann Kingiri - ACTS/AfricaLics Secretariat - TIP agenda development process in Africa

- Glenda Kruss - HSRC, South Africa. Brief intervention based on South African experience
- George Owusu Essegbey - STEPRI, Ghana. Brief intervention based on dynamics of STI policy formulation in Africa and Ghana in particular.

Thematic session 2: The Role of Frugal Innovation in Sustainable Development in Africa

Conveners: Centre for Frugal Innovation in Africa - Kenya Hub

Location: B 106

Within the innovation studies community, and indeed the AfricaLics community, there is consensus that growth and developmental goals in Africa will not only be achieved through supply-driven, R&D intensive, capital- and scale-intensive innovation - previously seen as the dominant trajectory of innovation and growth. New models of innovation that aim to not only address the needs of low-income and marginalized communities, but integrate them in development efforts, are gaining relevance both in academic and policy circles. This special session aims to interrogate 'frugal innovation' as one such model and frugality as a philosophy of innovation in the African context. Frugal innovation encompasses (re)designing products, services, systems, and business models in order to reduce complexity and total lifecycle costs, and enhance functionality, while providing high user value and affordable solutions for relatively low-income customers. Such innovations are produced by different types of actors: large multinational corporations, local blue-chip companies, SMEs in the formal and informal sectors, or by grassroots community members. The innovations may be developed as commercial proposition to sell to the so-called Bottom of the Pyramid, or by community members to address local constraints and deal with acute scarcity. While there are many documented cases of what are deemed 'successful' frugal innovations, the question remains as to whether these innovations automatically contribute to inclusive and sustainable development within poor communities.

There is a growing stream of literature around this notion of frugal innovation. However, most publications originate from outside the continent, with many contributions coming from Asia (India especially) and Europe (especially the United Kingdom, Germany, The Netherlands and Finland). Analysis tends to focus on India, the UK, USA, with a number of contributions on a few emerging economies such as Brazil, China, and Kenya. Yet, we expect that due to the

often-severe constraints in many regions in sub-Saharan African countries, frugality is a defining characteristic of most innovative endeavors and livelihood strategies. African scholars may be analyzing efforts to innovate or even survive under resource constraints, but not necessarily using the terms 'frugal innovation' or 'frugality'. This session will use the following questions for discussion:

- How is frugal innovation / frugality interpreted in the African context?
- Which theoretical lenses have/can be used to analyze frugal innovation in the African setting?
- Can/should policy makers play a role in supporting frugal innovation in Africa? If so, how?

Panelist

- Elsie Onsongo, Centre for Frugal Innovation in Africa - Kenya Hub (Moderator)
- Peter Knorringa, Centre for Frugal Innovation in Africa (The Netherlands)
- Donald Mmari, Research on Poverty Alleviation (REPOA) (Tanzania).
- Gussai Sheikheldin - STIPRO, Tanzania
- Manir Abdullahi Kamba, Bayero University Kano (Nigeria)
- Ofonmbuk Esther Ekong, University of Ottawa, Canada

Thematic session 3: Promoting innovation and entrepreneurship for industrialization and development in Tanzania

Organizer: University of Dar es Salaam (UDSM), Tanzania

Location: B 318

African economies are increasingly facing the pressure to replace their primary commodities with value added goods while engaging with global markets. It is also imperative that the African labor force is diverted from agriculture, to the more productive sectors such as manufacturing and agro-processing, and thus increase the overall productivity. The Non-farm entrepreneurship in the rural areas for instance can benefit the households by diversifying their income sources and provide a steady source of income during difficult agricultural seasons. Yet the surplus of labor from agriculture is predominantly being absorbed by low productivity sectors such as retail trade. It is estimated that 22 percent of

	<p>Africa's working-age population are starting new businesses, a highest rate across the world. While this reflect the positive aspects of Africa's growth, maintaining and enhancing such businesses remains a great challenge. Emerging Small and Medium Enterprises (SMEs) including those with less than 20 employees and with the age lower that 5 years constitutes the leading providers of formal sector jobs in sub-Saharan Africa. An addition of 30 million young people are set to enter the African workforce every year between 2017 and 2030. These young entrepreneurs constitute the change agent in terms of industrialization, as they take on innovative yet risky activities and create new job opportunities.</p> <p>A series of incremental and frugal innovations emerging within Africa does not only assist in solving the continent's developmental challenges, but it also contributes to the global pool of knowledge. Under the leadership of its current President Dr. John Pombe Joseph Magufuli, the Tanzanian government for example has acquired the driving seat in driving the Africa's industrialization efforts. The best practices, challenges and opportunities for entrepreneurship and industrialization processes that maintain the environment fit well with the 4th AfricaLics conference, which is themed: <i>Innovation and transformative capacities for growth and sustainable development in Africa</i>.</p> <p>The aim of this special session is to stimulate the debate on Africa's industrialization efforts with a lens of innovation and entrepreneurship. The panel will use a case of Tanzania to unpack the Tanzanian government's political will and strategic efforts to promote industrialization. At the same time the panel will assess the business environment, while discussing an emerging policy space and interventions targeting the developments and formalization of SMEs. The panel will also explore strategies which have been devised to promote women's engagement in entrepreneurship, financing mechanisms to support entrepreneurs in Tanzania and the development of skills which are the most relevant for entrepreneurs.</p> <p>Panelists</p> <ul style="list-style-type: none"> ▪ Mariam Nchimbi - UDSM, Tanzania ▪ Jumanne Mtambalike - Sahara Sparks, Tanzania ▪ Athmani Mgumia - COSTECH, Tanzania
12:30 - 14:00	Lunch

<p>14:00 - 15:15</p>	<p>Thematic session C Thematic session 1: Engineering education, development and growth in Africa Organizer: STIPRO, Tanzania & ACTS, Kenya Location: B 100</p> <p>Africa has a significant shortage of engineers. In one sector, it was estimated that 2.5 million new engineers and technicians are required in sub-Saharan Africa (SSA) in order to meet the development goals on access to clean water and sanitation. Many engineering graduates in SSA find it difficult to land employment in engineering fields because of competence challenge. A study that was carried out by the Royal Academy of Engineering (2012) concluded that academic staff in higher learning institutions in SSA "had very little exposure to engineering practice [in industries and public works]" despite being well-qualified. The teaching style in most academic institutions in the region was described as "chalk and talk" as opposed to problem-based learning (PBL).</p> <p>Engineering plays a key role in development: technological capabilities, industrial activities, and economic growth. In the contexts of developing societies, engineering is the main catalyst of technological change, while technological change is essential for economic growth and human development. Engineering education should therefore be understood as quite influential on both economic growth and innovation in Africa.</p> <p>The current shortage in quantity and deficiency in quality, in engineering in Africa overall, can be traced more specifically to gaps in policies and capacities.</p> <p>Recently, some research activities in Africa have endeavored to explore possibilities to bridge the gaps in policies and capacities in the 'engineering systems', nationally and regionally.</p> <p>This session is organized to elicit discussions around how competency of engineering graduates in Africa can be enhanced through enhancing and strengthening engineering education. The session will also deliberate on the broad and long-lasting impacts on engineering education in Africa for the sake of sustainable development and growth and how policies can be stimulated in this regard.</p> <p>The session is inspired by the "supporting the science, technology, engineering and mathematics (STEM) research cultures in Africa"</p>
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program funded by International Development Research Centre (IDRC).

Panelist

- Juliana Machuve, UDSM, Tanzania
- Gussai Sheikheldin, STIPRO, Tanzania
- Ann Kingiri, ACTS, Kenya
- Charles Nzila, Moi University, Kenya
- Mona Lisa Dahms, Aalborg University, Denmark

Thematic session 2: The 4th Industrial Revolution and Sustainable Development in Africa.

Conveners: Edward Lorenz and Julius Gatune

Location: B 106

Background and theme

At both the national and international levels policymakers, industrialists, researchers and the development community more widely have been concerned to address the current and future impacts of emerging and possibly disruptive technologies on economic development. The range of emerging technologies with potentially big impacts is much include the digitization of labor and financial markets, artificial intelligence and big data analytics applied to medical and financial decision-making, materials science including 3D-printing, and biotechnology including bio-control systems applied to agriculture.

There is wide acknowledgement that these emerging technologies hold out promise for promoting sustainable development and improving the quality of life though their potential positive impacts on productivity, on more efficient energy and resource use, and though the way they contribute to product innovations favoring more sustainable consumption patterns.

Beyond the worry that automation technologies are resulting in an absolute decline in the number of jobs, as machines displace workers, there are big concerns about their impact on skills and occupations. Another key area of concern in developed countries is the impact of digital platforms for labor or personal services, such as Uber or Taskrabbit, on social security and welfare provision. At a global level the differential take-up of new emerging technologies raises

concerns about a growing technology gap between developed and developing countries.

More research is needed to assess the extent of adoption of emerging technologies, factors affecting their dissemination or scaling across countries at different levels of industrial development. The panelists, in accordance with their areas of research interest and expertise, will address these issues taking an innovation systems approach that recognizes that institutional frameworks and local context mold and support innovation and technology adoption in countries at different levels of industrialization. The panel will address the following questions:

- I. What are the key pre-requisites for 4IR to deliver sustainable development?
- II. What are the main risks for increasing inequality within and across countries due to the adoption of 4IR including new emerging technologies and what are potential ways of addressing the inequality challenge?
- III. How can 4IR contribute to transformation of economies in least developed countries with a particular focus on agriculture and service sectors?
- IV. How can industrial and social policy can be used to reduce the negative potential impacts and increase the positive potential impacts of the adoption of emerging technologies?
- V. What are the main areas where there is a need for further research on the impact of 4IR and how can the AfricaLics community best contribute to this research agenda?

Panelists

- Edward Lorenz - University of Nice-CNRS, France
- Julius Gatune - ACET, Ghana and Maastricht School of Management (MSM)
- Susan Cozzens - Georgia Institute of Technology, USA
- Lotta Takala-Greenish - UWE Bristol and University of Johannesburg, UK
- Mammo Muchie - Tshwane University of Technology

Thematic session 3: Towards a measurement programme for innovation to serve the developmental needs of sub-Saharan Africa

Organizer: Centre for Science, Technology and Innovation Indicators (CeSTII), Human Sciences Research Council, South Africa

Location: B 318

Measuring innovation is important for any country, to develop indicators that inform the design of industrial policy and monitoring and evaluation to enable effective implementation. Over the years, well-established measurement programmes for research and development and innovation have emerged, promulgated mainly by the OECD. A measurement programme includes a measurement framework that sets out a conceptualization, and develops and standardizes definitions, instruments and methods for collecting and analyzing data. Many countries in Africa and the global South have adopted and adapted the measurement frameworks and instruments derived from the OECD programmes.

To what extent are the standardized frameworks and instruments aligned to policy frameworks and development needs at the regional and national levels? For example, in sub-Saharan Africa, over 75% of economic activities happen in the informal sector. Yet we only tend to measure innovation in formal businesses and in some sectors. How can we capture innovation activities that are not well understood as yet, such as innovation by informal businesses and households, and bring these realities into the measurement programme? Secondly, how can we strengthen national and regional institutional arrangements for indicator development in Africa to implement a more suitable measurement programme? Thirdly, who should be involved in setting the measurement agenda in addition to the usual suspects - i.e. statisticians, policymakers and researchers? This panel proposes to address the following question: What is an appropriate measurement programme for innovation in sub-Saharan Africa? We argue that we need to reconsider the what, who and how of measuring innovation. As a starting point, we challenge contributors to this session to address the following:

- i. How can standard STI measurement instruments be adapted to create new indicators more appropriate to a developmental context characterized by high levels of inequality, poverty and unemployment?
- ii. Innovation in households and the public sector, and social innovation are all areas that need to be addressed in measurement programmes in Africa, in some way. What is not

	<p>as well developed is the design and methodology for measurement of innovation in the informal sector.</p> <p>iii. For innovation in the informal sector, who are the actors that should be involved in the measurement system (partners at a local level, such as informal businesses, intermediary actors, and so on)? How suitable are our research tools for the informal sector? What would be suitable methodologies?</p> <p>Panelist</p> <ul style="list-style-type: none"> ▪ Kgabo Ramoroka - Wits Business School, South Africa (Moderator) ▪ Glenda Kruss - CeSTII - HSRC, South Africa ▪ Nazeem Mustapha - HSRC, South Africa ▪ Oluseye Jegede - Obafemi Awolowo University/ University of Johannesburg, Nigeria and South Africa
15:15 - 15:45	Break
15:45 - 17:00	Conference closing session
17:15	Buses leave for the hotel

11.3 Annex 3: Conference Committees

Scientific committee

Prof. Cuthbert Kimambo	UDSM
Prof. Benedict Mongula	UDSM
Prof. Bavo Nyichomba	UDSM
Dr. Adgot Komba	UDSM
Dr. Kelefi Mwatimwa	UDSM
Dr. Herzon Makundi	UDSM
Eng. Dr. Lawrence J. Kerefu	St. Joseph University in Tanzania (SJUIT)
Dr. Bitrina Diyamett	STIPRO
Dr. Gussai Sheikheldin	STIPRO
Mr. Musambya Mutambala	STIPRO
Dr. Athuman Mgumia	COSTECH
Prof. Abdelkader Djeflat	University of Lille, France/Algeria
Dr. Alexandre Vera Cruz	UAM, Mexico

Dr. Ann Kingiri	ACTS and AfricaLics Secretariat
Prof. Daniel Kitaw	Addis Ababa Institute of Technology (AAiT), Addis Ababa University (AAU)
Prof. David Kaplan	University of Cape Town, South Africa
Prof. Erika Kraemer-Mbula	University of Johannesburg, South Africa
Dr. Geci Karuri-Sebina	South African Cities Network
Dr. George Essegbey	STEPRI of the Council of Science and Industrial Research (CSIR), Ghana.
Prof. Mammo Muchie	Tswane University of Technology, South Africa
Dr. Margrethe Holm Andersen	Aalborg University, Denmark and AfricaLics Secretariat
Prof. Rasigan Maharajh	Institute for Economic Research on Innovation, Tshwane University of Technology, South Africa
Prof. Rasmus Lema	Aalborg University, Denmark
Dr. Rebecca Hanlin	ACTS and AfricaLics Secretariat
Dr. Ogundiran Soumonni	Wits Business School, South Africa

Local Organizing Committee (LOC)

Dr. Amelia Buriyo	UDSM
Dr. Emanuel Elia	UDSM
Dr. Fatuma Simba	UDSM
Dr. Hezron Makundi	UDSM
Dr. Mona Mwakalinga	UDSM
Mr. Jackson Isidori	UDSM
Mr. Joseph Ngowi	UDSM
Dr. Juliana Machuve	UDSM
Dr. Athuman Mgumia	COSTECH
Mr. Method Rutechura	COSTECH
Ms. Hildegald Mushi	COSTECH
Dr. Bitrina Diyamett	STIPRO
Ms. Sulamba Shabaan	STIPRO
Mr. Heric Thomas	STIPRO
Mr. Innocent Wawa	STIPRO

AfricaLics Scientific Board (ASB)

Prof. Abdelkader Djeflat	University of Lille, France/Algeria
Dr. Alexandre Vera Cruz	UAM, Mexico

Prof. Daniel Kitaw	Addis Ababa University (AAU)
Prof. David Kaplan	University of Cape Town, South Africa
Prof. Erika Kraemer-Mbula	University of Johannesburg, South Africa
Dr. Geci Karuri-Sebina	South African Cities Network
Dr. George Essegbey	Science and Technology Policy Research Institute (STEPRI) of the Council of Science and Industrial Research (CSIR), Ghana.
Dr. Gregory Mvogo	University of Douala
Prof. Mammo Muchie	Tswane University of Technology, South Africa
Mr. Rajesh Gopalakrishnan Nair	Gandhigram Rural Institute Deemed University
Prof. Rasigan Maharajh	Institute for Economic Research on Innovation, Tshwane University of Technology, South Africa
Prof. Rasmus Lema	Aalborg University, Denmark
Dr. Ogundiran Soumonni	Wits Business School, South Africa
Dr. Opeyemi Eytayo AYINDE	Obafemi Awolowo University

AfricaLics Secretariat

Dr. Ann Kingiri	ACTS and AfricaLics Secretariat
Dr. Rebecca Hanlin	ACTS and AfricaLics Secretariat
Dr. Margrethe Holm Andersen	Aalborg University and AfricaLics Secretariat
Mourine Chepkemoi	ACTS and AfricaLics Secretariat
Moses Owidhi	ACTS and AfricaLics Secretariat

11.4 Annex 4: List of conference participants

No:	Surname	First name	Organization
1	Abdullahi Kamba	Manir	Bayero University Kano
2	Abodunde	Olufikayo Opemipo	Federal Polytechnic Ado Ekiti
3	Adegbite	Waliu Mulero	National Centre for Technology Management, Federal Ministry of Science and Technology, Obafemi Awolowo University, Ile-Ife, Nigeria
4	Adeosun	Oluyemi	University of Lagos
5	Adepoju	Adeyemi Oluwaseun	Federal University of Technology, Akure
6	Aderomou	Babarinde Rene	University of Abomey-Calavi
7	Adewusi	Bolanle Eyiwumi	Obafemi Awolowo University

8	Adeyeye	Adedamola David	National Centre for Technology Management
9	Adinew	Moges Tufa	University of Gothenburg
10	Agbekponou	Kossi Messanh	University of Lome
11	Agutu	Fredrick	Egerton University
12	Ahodode	Bernadin Geraud Comlan	University of Yanoude II
13	Ajibade	Toyin Benedict	University of Ilorin
14	Akamin	Ajapnwa	University of Buea
15	Akintelu	Sunday Olufemi	Samuel Adegboyega University
16	Akintelu	Mary Taiwo	Samuel Adegboyega University
17	Alani	Jimmy	Makerere University
18	Ambrose	Itika	University of Dar es Salaam
19	Andersen	Maj Munch	DTU
20	Aodu	Babatunde Adetunji	National Centre for Technology Management
21	Appiah	Gifty Boakye	Kwame Nkrumah University of Science and Technology
22	Avenyo	Elvis Koroku	University of Johannesburg
23	Awoleye	Olusesan Michael	Obafemi Awolowo University
24	Ayinde	Opeyemi Eyitayo	The Ohio State University
25	Baassiry	Hadia	Nice Sophia Antipolis University
26	Byrne	Rob	University of Sussex
27	Chepkemoi	Mourine	ACTS - AfricaLics
28	Cozzens	Susan E	Georgia Institute of Technology
29	Cundall	Alan	Makerere University
30	Dahms	Mona Lisa	Mona Lisa Dahms
31	Dancan	Ray	University of Dar es Salaam
32	Diyamett	Bitrina Daniel	STIPRO
33	Djeflat	Abdelkader	MAGHTECH
34	Donkor	Antonia Bernadette	University of Ghana
35	Edeme	Richardson Kojo	University of Nigeria
36	Ekong	Ofonmbuk Esther	University of Ottawa, Canada
37	Elia	Emmanuel	University of Dar es Salaam
38	Essegbey	George Owusu	Science and Technology Policy Research Institute
39	Faria	Lourenço G. D.	Technical University of Denmark

40	Fu	Xiaolan	Technology and Management Centre for Development, Oxford University
41	Gbadegesin	Tosin	University of Ibadan Centre for Sustainable Development, Nigeria
42	Gopalakrishnan Nair	Rajesh	Gandhigram Rural Institute Deemed University
43	Gurmessa	Zelalem Bayisa	Haramaya University
44	Habiyaremye	Alexis	Human Sciences Research Council
45	Haji	Haji Ali	The State University of Zanzibar
46	Hanlin	Rebecca	ACTS - AfricaLics
47	Hellstrom	Johan	Embassy of Sweden
48	Henry Kitona	Anne	University of Dar es Salaam
49	Howell	Rachel Jean-Boeger	Delft University of Technology
50	Ibrahim	Glory Ramadhan	Kilimanjaro Christian Medical University College
51	Idowu	Harrison Adewale	Obafemi Awolowo University, Ile-Ife, Nigeria
52	Ikehi	Michael Ejime	University of Nigeria, Nsukka
53	Isdory	Jackson	University of Dar es Salaam
54	Jacobs	Peter Terrance	Human Sciences Research Council
55	Jegade	Oluseye Oladayo	Obafemi Awolowo University
56	Joseph Kalugasha	Josephat	University of Dar es Salaam
57	Kaplan	David Ellis	Department of Economics University of Cape Town
58	Karimi	Florah Katanu	Consortium for Advanced Research Training in Africa
59	Karuri-Sebina	Geci	South African Cities Network
60	Katothya	Gerald	Jomo Kenyatta University of Agriculture and Technology
61	Kessy	Joackim	Kilimanjaro Christian Medical University College
62	Kigwa	Rebecca Njoki Karaya	Karatina university
63	Kilelu	Catherine	African Centre for Technology Studies
64	Kingiri	Anne	African Centre for Technology Studies - AfricaLics Secretariat
65	Kitaw Azene	Daniel	Addis Ababa University
66	Kiwanuka	Joseph	Makerere university
67	Knorringa	Peter	Erasmus University

68	Komba	Adalgot	University of Dar es Salaam
69	Korir	Michael Kirwa	Moi University
70	Kruss	Glenda	Human Sciences Research Council
71	Kurete	Faith	Bulawayo Polytechnic
72	Lema	Rasmus	Aalborg University
73	Lorenz	Edward	University of Nice
74	Lugemwa	Mariana	Science Technology and Innovation Policy Research Organization
75	Machange	Mercy	University of Dar es Salaam
76	Machuve	Juliana Zawadi	University of Dar es Salaam
77	Makundi	Hezron Ronald	University of Dar es Salaam
78	Mandaza	Mclarence Shungu	Pan African University
79	Maneno Sanga	Stoweka	University of Dar es Salaam
80	Manumbu	Salvina	University of Dar es Salaam
81	Marcel Joachim	Flaviana	University of Dar es Salaam
82	Mbelwa	Latifa	University of Dar es Salaam
83	Mgumia	Athman	Tanzania Commission for Science and Technology
84	Mmari	Donald	Policy Research for Development
85	Mreji	Pamela Adhiambo	Technical University of Kenya
86	Msebeni	Wivina	University of Dar es Salaam
87	Mtei	Heric Thomas	STIPRO
88	Muchie	Mammo	Tshwane University of Technology
89	Mushi	Hildegalda Prosper	Tanzania Commission for Science & Technology
90	Mushi	Anna	University of Dar es Salaam
91	Mutambala	Musambya	Science Technology and Innovation Policy Research Organization
92	Mvogo	Gregory	University of Douala
93	Mwakajinga	Daniel	University of Dar es Salaam
94	Nalunkuuma	Justine	Makerere university
95	Nassoro	Chonga	University of Dar es Salaam
96	Ngowi	Joseph	University of Dar es Salaam
97	Nino	Denis	Makerere university
98	Numi	Ann Njeri	African Centre for Technology Studies
99	Nzila	Charles	Moi University
100	Obed Nyome	Rodric	University of Dar es Salaam
101	Ochieng	Jacob	University of Nairobi

102	Ogundele	Oluwatosin Temitayo	ARISE Microfinance Bank Limited
103	Oladele	Jumoke Iyabode	University of Ilorin
104	Oloyede	Adeola	University of Ilorin
105	Oluyide	Olaniyi Oluwaseun	Obafemi Awolowo University
106	Onsongo	Elsie K.	Centre for Frugal Innovation in Africa
107	Onumah	Justina Adwoa	University of Ghana
108	Onyango	Joel	African Researchers Consortium
109	Opola	Felix Ouko	Wageningen University and Research
110	Ouma	Matilda Auma	Jaramogi Oginga Odinga University of science and Technology
111	Owidhi	Moses	African Centre for Technology Studies
112	Patrick	Innocent Wawa	Science Technology Innovation Policy Research Organization
113	Ramoroka	Kgabo	Wits Business School
114	Rutechura	Merchades	Tanzania Commission for Science and Technology
115	Rwegoshora	George	University of Dar es Salaam
116	S. Buriyo	Amelia	University of Dar es Salaam
117	Said	Omary	University of Dar es Salaam
118	Salum	Leila	University of Dar es Salaam
119	Shaban	Sulamba	Science Technology Innovation Policy Research Organization
120	Sheikheldin	Gussai Hamror	STIPRO
121	Simba	Fatuma	University of Dar es Salaam
122	Soumonni	Ogundiran	Wits Business School
123	Suleiman	Abdulla Ahmed	The State University of Zanzibar
124	Takala-Greenish	Lotta	University of the West of England and University of Johannesburg
125	Thapa	Namrata	Institute of Economic Growth
126	Van Paassen	Johanna Maria	Wageningen University
127	Vera-Cruz	Alexandre	Metropolitan Autonomous University
128	Wandera	Faith	Ministry of Energy, Kenya
129	Wangwe	Samuel	Economic and Social Research Foundation
130	Yongabo	Parfait	University of Rwanda

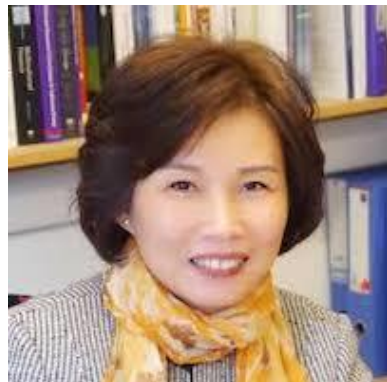
11.5 Annex 5: Profile of keynote speakers



Prof. Sam Wangwe

Prof. Samuel Wangwe, Principal Research Associate, Economic and Social Research Foundation, Dar es Salaam, Tanzania will be the first keynote speaker. Prof. Wangwe is a globally respected economist with a long-term and diverse track record working with industrialization processes - both academically and policy wise, in and outside Tanzania. Prof. Wangwe has done both research, consultancies and policy advice to the Tanzanian government. Prof. Wangwe talked about challenges and achievements in Tanzania as far as innovation and transformative capacities for growth

and sustainable development is concerned. Key issues include lessons learned from the Science and Technology policy in Tanzania; criteria of success/lack of success and what options and obstacles are there for sustainable, decent employment generating growth in Africa (achievement of SDG 8)? In other words - how can the industrialization led growth path Tanzania is currently following be effectively implemented and be balanced with the need to take into account pertinent issues of environmental and social sustainability?



Prof. Xiaolan Fu

Prof. Xiaolan Fu, Professor of Technology and International Development, University of Oxford, UK will be the second keynote speaker. Prof. Fu is an outstanding international scholar in the field of innovation and development. She is a member of the Ten-Member High Level Advisory Group of the UN Technology Facilitation Mechanism and of the Governing Council of the UN's Technology Bank for Least Developed Countries. She is also a member of the UN SDSN Leadership Council led by Jeffrey Sachs and a member of the Council for Global

Economic Transformation co-chaired by Joseph Stiglitz and Michael Spence. Her research interests include innovation, technology and industrialization; trade, foreign direct investment and economic development; emerging Asian economies; innovation and productivity in the UK/US.

Prof. Fu's keynote focused on international perspectives and lessons learned on how to foster innovation and transformative capacities for growth and sustainable development in Africa, using country specific experience e.g. from China. The keynote will focus on how innovation systems research has developed

historically and how it may contribute to understanding and meeting current grand challenges such as climate change, the need for decent jobs and poverty reduction in African countries. How may national and global science, technology and innovation policies and practices interact better to ensure sustainable development paths in African countries and worldwide? How do the deepening of trade and investment relations between Africa and China affect the prospects for development in Africa?



Dr. Glenda Kruss

Dr Glenda Kruss is the Deputy Executive Director of the Centre for Science, Technology and Innovation Indicators at the Human Sciences Research Council. Over the past ten years, she has worked in the field of innovation studies, to understand the role of universities and public research institutes in economic and social development, and the determinants of skills and knowledge flows within sectoral, national and global systems of innovation. Her current research focus is oriented towards more contextually appropriate measures of STI for inclusive and sustainable development in sub-Saharan Africa. She has collaborated widely on comparative research projects in Africa, Latin America, Asia and Europe, and has led large scale projects for national government, building alliances and networks between researchers, policy makers and practitioners in South Africa.

Dr Kruss focused on the role of universities in *innovation and building transformative capacities for growth and sustainable development in Africa*. How critical are universities in enhancing innovation to address a country's development challenges? How can African universities, policy makers and the private sector collaborate to help develop the innovative and transformative capacities required to balance growth with inclusive and sustainable development in Africa? What lessons can be drawn from the STI policies, funding mechanisms and experience of universities in Southern Africa

11.6 Annex 6: Speeches

Official opening session - President AfricaLics, Dr. Bitrina Diyamett

Honorable Innocent Lugha Bashungwa, Minister of Industry, Trade and Investment, United Republic of Tanzania, Prof. William Anangisye, Vice Chancellor, University of Dar es Salaam, Development Partners Represented,

Members of the Press, Distinguished participants, all protocols observed, Ladies and Gentlemen
Good morning!

On behalf of the AfricaLics fraternity, and my own behalf, let me join the Vice-Chancellor of the University of Dar es Salaam Prof William Anangisye in expressing a very warm welcome to all of you to this three days conference on **Innovation and transformative capacities for growth and sustainable development in Africa**. Let me also add the fact that I am also representing the Board and staff of STIPRO as one of the partner organizations that are hosting this conference; and above all, the LOC.

Distinguished Participants, Ladies and Gentlemen

The major reason I am standing here - in all those capacities - is to welcome you and give a brief background on AfricaLics, and within this state the objective of the 3 days conference. But before I do this, allow me to say a number of very heartfelt thank you.

On top is the Vice Chancellor of the University of Dar es Salaam for agreeing to host us at this very beautiful campus. I also would like to thank our National Commission for Science and Technology, COSTECH, not only for partnering in the organization of this conference, but also for providing additional funding for hosting the conference.

My very sincere and heartfelt thank you also goes to the Local Organizing Committee from the three-partner organization namely UDSM, COSTECH and my own organization, STIPRO. As the Chair of this Committee, I understand how hard and smarter these people worked, please stand up for all of us to see you. In relation, I let me also take the opportunity to thank the AfricaLics secretariat, who has been helping the local organizing committee from a distance (they are based at ACTS, Nairobi) - can you also stand.

Above all, I wish to thank the government of Tanzania for taking keen interest in this conference: The presence of the Minister for Industry, Trade and Investment, is a testimony to this. So, thank you very much honorable Minister for finding time to be with us this morning.

Finally, but not least, I thank Sida - through AfricaLics Secretariat - for their financial support, without which we would not have been able - not only to organize this conference - but also many other activities of the network - I just hope that African governments are now ready to take over, because what you are doing is not for Sweden, but for Africa.

Distinguished Participants, Ladies and Gentlemen

Let me now quickly turn to the brief background on the AfricaLics, and within this briefly state the objective of this 3 days conference (this won't be anything new for many of you - this is the fourth time we are organizing such conferences, and at each conference we have been introducing AfricaLics, and I think we will do the same until we reach all the 54 African countries) - because for every new country there would be people who are hearing about AfricaLics for the first time).

Distinguished participants, Ladies and Gentlemen, AfricaLics, in the long form the African Network on Economics of Learning, Innovation and Competence Building systems, is a network of researchers and academics interested in strengthening the use of innovation and related activities to speed up social and economic development of African countries. The network was initiated in 2012 in Dar es Salaam, Tanzania - so for us Tanzanians, this is a very special conference - it is like a seven years old baby coming back home.

Ladies and gentlemen AfricaLics - although independent - is a part of a global community by the name of *GLOBELICS*, in the long form - Global Network for Economics of Learning, Innovation, and Competence Building Systems; there are also similar regional and country LICS representing Latin America, Asia, China and India.

In terms of governance structure, on top of the network is a scientific Board, which is a main decision-making body, and the secretariat which is responsible for the day to day activities of the network. The Board is made of leading experts on innovation and development from all over Africa - with some representation from outside Africa, while the secretariat is based at the African Center for Technology Studies, based in Nairobi. Can I request the Board to stand up?

Distinguished Participants, Ladies and Gentlemen

The major drive behind the initiation of AfricaLics is the centrality of innovation in social and economic development, and the critical role of research in generating knowledge for innovation: **Ladies and gentlemen** we all know that social and economic development in the current environment of free market and globalization depends on how competitive you are as a nation, and it has become clear that competitiveness now days do not depend on the traditional factors of production, but on the efficiency with which firms and nations use existing knowledge, and on the speed with which they produce and put in use new knowledge to ever dynamically innovate: it is the essence of the terminology of knowledge society. This is of critical importance to Africa as the continent

embarks on structural transformation towards strengthening capabilities for adding value to its abundant natural resources and thereby achieve sustained growth and generate adequate and decent employment for its people.

Distinguished Participants, Ladies and Gentlemen

We all know how much Africa is losing out in terms of desperately needed jobs by exporting its natural resources unprocessed or only semi processed. There is no way Africa can reverse this trend if the continent is not ready to invest in knowledge. This is even more critical given the rapid technological change and automation that is currently taking place elsewhere in the world. For instance, the traditional low-tech sectors such as the agro-processing and therefore easy entry by technologically lagging countries are now being revolutionized through automation such as the use of robotics - radically bringing down cost of production. Under such circumstances the nations and firms that will survive are those that will invest in knowledge generation and ever dynamically innovate.

Ladies and gentlemen, there are two major types of knowledge for development: First, is knowledge for the production of new and improved products and processes; this is normally produced through research that is largely in the field of natural and engineering science (normally understood as R&D). The second kind of knowledge is that which is used for decision making, normally produced through social science research. Within this category, is an emerging sub-field of innovation and development research/innovation studies/science and technology studies, etc. different universities have given different names for this field of study.

It is this second type of knowledge I want to talk about, not because the first type is less important, but because without the expertise in the second type, countries cannot properly and efficiently invest in the first type; for instance, without research on innovation and development, you cannot even properly pick your R&D priorities or effectively link R&D to production.

Given such importance, it is very unfortunate that very little recognition and therefore investment is given to this kind of research in Africa. For instance, according to existing studies - identifiable from relevant journals - less than 10% of innovation publications are on developing countries, and most of the authors are from developed countries; and am sure within this 10%, very little would be coming from Africa. And this is happening at the time that most African countries have realized the role of science, technology and innovation and are busy either making policies, reviewing them etc. One then wonders, how are these policies being made? What informs them? Most likely by models developed through empirical evidence generated in more developed countries, and it is largely the

reason such policies are making only very limited impacts on social and economic development of African countries.

Distinguished Participants, Ladies and Gentlemen,

It is against this background the AfricaLics was initiated - to build African capacity in innovation and development research so as to produce relevant statistics and knowledge that informs STI policies that can have impact on the lives of the people. AfricaLics carry out several activities to realize this major objective; the activities include holding of regular conferences like this one. The conference brings together researchers and policy makers to learn from each other and provide evidence for policy and raise questions for further research.

Every time a theme that is topical is picked for debate at the conference. The major focus of this year's conference theme is on how innovation concept is understood and put into use, and how this understanding is impacting on the policy making process, especially focusing on Africa.

Distinguished participants, Ladies and gentlemen

The concept of innovation is dynamic - in the sense that models around it have always been slightly changing - along with social and economic environment facing different countries at different times; however, recently, academic and policy discourses on innovation seem to be taking a new turn in the history of innovation studies (it is like a completely new paradigm is emerging) - a turn away from emphasizing innovation theories and models that are based on productivity and growth to those focusing on environmental issues and inclusivity. The major argument of the new stream focusing predominantly on environment and social issues, rather than economic consequences of innovation, is that an excessive focus on economic outcomes of innovation and resulting innovation policies directed at promoting economic growth will not bring about the aspired change anywhere in the world, including Africa.

Distinguished participants, ladies and gentlemen; this new debate on the direction of innovation studies is coming at a time where African is at the peak of its growth debate - where policy on innovation is a critical part. As the debate gets intensified and widespread, it brings some kind of a dilemma on the part of policy makers. It is our role as innovation and development researchers to help in addressing this ensuing dilemma: to do research, provide context based evidence and influence the direction of the development of this emerging module so that it is also suitable for the African context; and this is precisely the major objective of this year's conference - as you can note from the theme. Otherwise,

ladies and gentlemen, the model, as it is now, has a number of shortcomings for its use in an African context. I personally have three:

First, the older, growth oriented innovation models - having come from the North - are not yet clearly understood in an African context - it is only now that African countries are seriously trying to study their innovation systems and reorienting their science, technology and innovation policies towards growth and general development of their countries: it is problematic to work on the transformation of something that does not exist as yet - when we talk of policy, we talk of the course of action and not plans in blue prints. If it is not being implemented, it is not a policy

Second, while in the now rich countries, innovation led growth has taken roots and is taking place through clear cut market mechanism, and therefore hardly needing policies to influence them, in poor countries such as those in Africa - where growth promoting innovation has not taken roots and markets and systems for the production, dissemination and use of knowledge, are weak - a policy guidance is of absolute necessity. Good example is, while in rich countries, it is the firms that are proactively searching for cutting edge knowledge from the universities in order to innovate; Africa is struggling to connect its universities and the industry through policies.

Third, it is not clear how the said transformative innovation model can help African countries to grow their economies and generate massive employment that the continent needs more than any other part of the world. And it is an urgent need!

To conclude my three points - with my little expertise on innovation and development, I argue that African countries, because they have been passive participants in the earlier models of innovation, it is very challenging to make them active participants in the emerging model, knowing that, innovation is context specific, evolutionary and path dependent. It is the role of researchers to figure out how to best address this grand challenge.

Ladies and Gentlemen,

Let me take this unique opportunity to speak to Tanzania as a host country:

While many African countries are today represented here, it is the host country that benefits most:

- i) We have here the press that takes the message around the country - many more people in Tanzania will be informed about the subject of the conference than any other African country represented here.

- ii) It is a unique opportunity for Tanzania where high level decision makers can meet with group of expertise on innovation and development the continent is blessed with - with some representation of global expertise, because many are here; it is an opportunity for the country because they have come to the country at little or no cost to us; let us take the opportunity to already start discussing some form of collaboration or support while, they are here.

Distinguished Participants, Ladies and Gentlemen,

I think I have said what I am supposed to say in my capacity (as an outgoing president of AfricaLics, having served for 7 years - my two terms and an additional extra one year); **thank you all for your attention.**

Dr. Amos Muhunda Nungu - Director General of the Commission for Science, Technology and Innovation (COSTECH), Tanzania

Guest of Honor,
Co-organizers,
Keynote Speakers,
Delegates,
Members of Press,
Ladies and Gentlemen;

Good Morning!

First of all, I thank all of you for attending this conference, and welcome guests from abroad to Tanzania. Karibuni sana.

Let me start by talking a bit about our institution and its link to today's meeting. The Tanzania Commission for Science and Technology (COSTECH) is a parastatal organization with the mandate of being the principal advisory organ to the Government on all matters relating to scientific research and technology development in the country. Our mission is to foster knowledge-based economy through promotion and coordination of research, technology development and innovation for sustainable development in Tanzania.

I have learned that AfricaLics brings together scholars, researchers and policy analysts who study development, innovation, learning and competence building in an African context. AfricaLics seeks to generate and use of high-quality knowledge in the field of innovation and development to promote inclusive and sustainable development in African countries. It is a shared platform for

collaboration between researchers, policymakers and practitioners in all parts of Africa. It is my sincere hope that this conference will come with deliberations that are relevant to the AFRICA we want, tailored to national and regional context and priorities.

The conference theme: "***Innovation and Transformative Capacities for Growth and Sustainable Development in Africa***" resonate well with COSTECH mandate and mission. That is why we hosted the AfricaLics pre-conference roundtable discussion in collaboration with STIPRO and the University of Dar es Salaam on the 17th October 2019.

Your key task during the 3 days is to come up with recommendations on how best research, Innovation and local Development efforts can be designed and implemented in ways that are locally driven, relevant, acceptable and promote economic growth and sustainable livelihood to communities. Bring out robust, workable strategies to ensure that the innovation and technologies achieve the desired national, regional and global goals.

As a national body responsible for coordination of STI, COSTECH will be ready to work on those deliberations from this conference.

I wish you fruitful deliberations.

Prof. William L. Anangisye, Vice Chancellor - University of Dar es Salaam

Guest of Honor, Hon. Mr. Innocent Bashungwa (MP), Minister of Industry, Trade and Marketing of the United Republic of Tanzania

Dr. Bitrina Diyamett, Chairperson AfricaLics

Dr. Amos Nungu, Director General COSTECH

Keynote Speakers

Members of the Conference Organizing Committee from the AfricaLics Secretariat, UDSM, STIPRO and COSTECH

Science Technology and Innovation policy scholars, Distinguished Conference Delegates,

Representatives of the Various Media Houses, Ladies and Gentlemen

Good Morning!

First of all, I would like to take this opportunity to welcome you to the 4th AfricaLics International Conference and to the University of Dar es Salaam (UDSM), which is one of the oldest Universities in Africa. University of Dar es Salaam through the University of Dar es Salaam Entrepreneurship Centre (UDIEC), in collaboration with the Science Technology and Innovation Policy

Research Organization (STIPRO) and the Tanzania Commission for Science and Technology (COSTECH) is proud to host this conference which is part of the AfricaLics network.

The University of Dar es Salaam has been a part of the AfricaLics network since its birth here in Dar es Salaam, on March 2012. Our partnership as AfricaLics community can be demonstrated by several joint activities related to capacity building, policy research and policy dialogues in the field of innovation, industrialization and development. I would like to commend the partnership framework between the University of Dar es Salaam, COSTECH and STIPRO, guided by a tripartite memorandum of understanding that we have signed. I am confident that this partnership will surely go beyond the success in organizing and hosting this conference, let us join our hands in building the capacity and informing policies on innovation, industrialization and development for a prosperous Tanzania and world.

Ladies and Gentlemen, the University of Dar es Salaam recognizes the importance of innovation policy and practice as an academic undertaking, and for that reason we created UDIEC in 2015. The main goal of UDIEC is to facilitate entrepreneurship and demand driven innovation through practice-oriented training quality education, business counselling and incubation to students, staff, MSMEs and other stakeholders.

Honorable Minister, before you are delegates from various parts of Africa and the world, including PhD students, early careers and established researchers and scholars from different disciplines with the overall aim of enhancing the quality of innovation studies in relation to development and growth in Africa. This is witnessed in the conference theme which revolve around Innovation and transformative capacities for growth and sustainable development in Africa. More than 70 papers will be presented in the Field of innovation and sustainable development.

Ladies and gentlemen let me assure this conference that the university community will provide all the needed support and services to ensure that you are able to engage well on policy informing discussions during the next three days here at the Julius Nyerere Campus.

Karibuni Sana Chuo Kikuu cha Dar es Salaam!

**Hon. Innocent Bashungwa - Minister of Industry, Trade and Investment,
United Republic of Tanzania**

Invited guests

Ladies and gentlemen

A very good morning to you all. I understand that you have already been welcomed by you Tanzania host to this country in general and to this congress in particular. However, coming from the government side, I feel indebted to extend to you all, in particular to those who are coming out of the country, a very warm welcome to our beloved country. I hope you will find time to enjoy the magnificent attractions out country has to offer. But above all, I hope you will enjoy the hospitality of our people that will make your stay in this country pleasant and memorable. I wish that you feel at home, away from home.

I am greatly honored to have the opportunity to address this powerful gathering of experts and great minds in innovation. This is an event of its kind to have taken place in our country. It definitely is a reflection of the more recent developments in the world where a lot of emphasis has been placed on advancing innovation at all levels. The role of innovation in national development cannot be over emphasized. The nations that have managed to be at the forefront of generating innovations are the same nations that are advancing rapidly economically. Innovations are a source of new products and solutions that address problems in the communities. The society needs innovations continuously to create opportunities for the younger generation, but also to improve the wellbeing of members of the community. New challenges are emerging as the lifestyles of the society change. The society must be sufficiently innovative to address the new challenges, as they arise. The process therefore has no end, as long as social advancement is desired.

Ladies and gentlemen,

Tanzania, like many other developing countries is experiencing new demands as the populations grow and lifestyles and consumption patterns change. There is growing demand for energy, water, food, housing, education, health care, transport and so on. The growing demand for various needs is putting a lot of pressures on the environment. Productivity needs to be improved to meet the growing needs with limited and most of the time with diminishing resources. New production processes that have smaller footprint on the environment need to be invented and applied accordingly. New and alternative sources of raw materials have to be found, developed and utilized replacing the depleted resources. Cleaner sources of energy have to be invented and developed sufficiently to be cost effective and efficient enough to be applied at large. Currently some of the

promising sources of cleaner energy are too expensive to be economically utilized by wider populations. More innovations are needed to make the application of these alternatives a reality.

While many efforts are being made to attain mass production more efficiently and at lower cost, other unwanted and at times unexpected outcomes result from these developments. A lot more waste is generated whose disposal pose formidable challenge to experts and environmentalists in general.

It is generally believed by many experts that the world is witnessing the 4th Industrial Revolution. This revolution is building on the foundations laid by 3rd Industrial Revolution which was mostly based on Information Communication Technology and application of Robotics. The 4th Industrial Revolution involves application of Artificial Intelligence (AI) and use of computers in very complex product designs. The use of three-dimensional (3D) printing enables production of materials that were impossible to produce in the past. It has made prototyping of complex structures even in tissue engineering possible. Disruptive technologies are emerging that are changing the way of life and the way economies are managed. The revolution is making more and more use of knowledge worker than physical worker.

Ladies and gentlemen,

Artificial intelligence is dominating the trends in innovation. Intelligent systems are being developed that to a great extent are able to do the functions that until recently it was impossible to imagine. The world has seen unmanned airplanes being used in the battlefield for spying and also for active combat. Engineers and scientists have developed driverless cars that may make the need to own motor vehicle an obsolete concept. The driverless cars can be commanded to take a passenger from home to the office at a click of the button. Intelligent robots are taking part in complex medical operations that humans alone would be challenged to undertake. Already telemedicine is becoming the norm of the day where doctors don't have to be at the side of the patient to be able to carry out an operation. They are enabled to do that from thousands of miles away by the existing technology. More intelligent robots are coming up that are increasingly able to learn new skills and show some ability to reason. Another important aspect of the 4th Industrial Revolution is the so-called Internet of Things (IoT). This is enabling interconnection of systems and fusion of technologies in ways unknown to-date. The internet of things is likely to generate smart cities where people are able to allow automatic systems handle various operations thus enabling them to dedicate more time to issues, they like most. We are informed that some hotels in China are pioneering fully automatic hotel services whereby the guest has the

freedom to book, check in and check out without the need to interact with the reception desk. Facial recognition is applied to identify the customer. All services are provided digitally including refreshments which are ordered and delivered using robots.

Ladies and gentlemen,

For us in the developing world, we have to be a bit concerned where these new developments are taking us. We have to take serious note of how we are likely to be affected by the fourth industrial revolution. Some of us are beginning to worry that we are likely to be bystanders in the whole new development if we don't take serious steps to try and be part of the change. Any laxity on our side is guaranteed to maintain the status quo whereby we are viewed as proven markets for those who always lead the way. The expected transformations are quite profound to the way of life of the human being. We have to raise awareness and encourage our experts to be cognizant of the new developments. We have to ensure they have access to relevant information and resources to enable them to make modest contribution towards the current trend. We need to see what contributions our scientists and engineers in our countries can make under the circumstances. We cannot afford to be side lined like in the previous revolutions. We have seen some countries making major strides in science and technology despite their initial low level of development. They have shown that it is possible, and it can be done. We need to learn from their examples. We need to translate their strategies and actions into our particular setting. Probably not the same strategies and actions will work for us. But we need not reinvent the wheel. We certainly have a lot to learn from the countries that have developed most recently (in comparative terms).

Ladies and gentlemen,

The main problem with our countries is the tendency to pay lip service to issues of major significance to the livelihood of our people. We need to change our way of doing things. We need to be proactive while making the right decision. We have to set our priorities right. While we are facing a multitude of challenges and issues, we still need to be able to decide where to start and how to start. More often than not, our countries have shown weaknesses in setting the correct priorities. Some people have said we tend to put the cart before the horse. This must change. We must invest where we believe there is maximum return for the sake of our people and our countries. Our predecessors have shown that there cannot be meaningful change if there is no investment in science and technology. We need to promote innovations at all cost. We need to develop the requisite infrastructure that support and promote innovations. We must reward those who dare to be innovative handsomely so that we may encourage others to follow their

steps. We have to set up innovation centres that are functioning properly. We need also to revisit our education system and the curricula that is in place. We need education that promotes innovation. We have to provide our youth education that challenge them to think. We should depart from the type of education that trains our youth to memorize and learn to reproduce. We need people who are able to think independently. People who dare to question the validity of principles and concepts. Let me at this point make reference to the theme of this conference: "Innovation and transformative capacities for growth and sustainable development in Africa". We want African minds that can unpack, interpret and question the validity of globally used concepts related to innovation and transformative changes, and how they apply to an African Environment.

Ladies and gentlemen,

I am saying this because innovation to a large extent is context specific - what works in one social economic context does not necessarily apply to another. We have to train people who believe all what exist today can be changed or at least be improved one way or the other. We have to train people who have the right attitude that cannot tolerate the business as usual syndrome at workplaces and at our research institutions. We need to develop the inquisitive mind that always wishes to find out what lies beyond the obvious.

Ladies and gentlemen,

It is my belief that you are meeting here because you feel that you have the duty and obligation to make a difference. I trust it by no accident you called this gathering what it is. I trust you are ready to take the bull by its horn. I call upon you to turn this meeting into a working session. Do not allow it to degenerate into a place for proclamation and empty slogans. It adds little value if each of you will come to the podium point out what shortcomings we have. We know we have them. But we want to hear what we can do about those shortcomings. We want concrete recommendations from this gathering of learned experts of innovation and development. You will have done us a great service if you opt to be innovative yourselves. Let this not be just another meeting of experts to exchange complex jargons of terminologies that at the end of the day will have no bearing to moving our countries closer to finding the solutions to our common problems. I challenge you to make a difference. If you don't do that, at the end of your gathering, I will feel that I have wasted yours and my time. I chose to come here, because I feel that you are able to bring change. I believe you can make impact. I hope I am right. I hope I am not dreaming. I hope I am justified to ask this of you.

Ladies and gentlemen,

I probably have talked too much already. This is probably not what you had anticipated at the outset of this important meeting. However, I think time has come for our countries to make change. We cannot afford to wait. It is not the duty of some unknown fellows out there. It is the duty of each of us. We have to try and be part of the change. We have to be the change itself. It is possible, so please play your part.

Ladies and gentlemen,

Once again, I thank you most sincerely for opting to convene in Tanzania. I hope you will have a very productive meeting. I will be more than happy to receive the set of recommendations that you wish the Governments to pursue.

I also believe you will find time from your busy schedule to explore touristic attractions of our land. I wish you fruitful deliberations.

Thank you.