



PROCEEDINGS OF THE 2019 ATPS ANNUAL FORUM, CONFERENCE AND SILVER JUBILEE CELEBRATIONS

THEME: Using Science, Technology and Innovation (STI) as a means for achieving the Sustainable Development Goals (SDGs) in Africa



30-31 OCTOBER 2019 / CROWNE PLAZA HOTEL, NAIROBI, KENYA

Editors:

Alfred Nyambane and Dr. Nicholas Ozor

Date:

December 2020

With support from:



Published by the African Technology Policy Studies Network

For further information on sponsorship, please contact:

Executive Director,

African Technology Policy Studies Network (ATPS)

8th Floor, Chancery Building, Valley Road;

P.O. Box 10081-00100, Nairobi, Kenya.

Email: executivedirector@atpsnet.org

Telephone: +254 (0) 20 2714092 (Landline); +254 (0) 713161928 (Mobile);

Website: <https://atpsnet.org/>

TABLE OF CONTENTS

Acronyms and Abbreviations	iv
Acknowledgement.....	v
Executive Summary.....	vi
1. INTRODUCTION.....	1
1.1 Overview of Science and Technology in Africa.....	1
1.2 The Role of African Technology Policy Studies Network (ATPS).....	2
1.3 Conference Theme and Sub-themes	2
1.4 Conference Objectives.....	4
1.5 Expected Outputs.....	4
1.6 Expected Outcomes	4
1.7 Conference Methodology	5
2. OPENING CEREMONY-SETTING THE CONTEXT	6
2.1 Welcoming Remarks from ATPS Kenya Chapter- Dr. Stephen Karimi	6
2.2 Welcoming Remarks from the ATPS Secretariat- Dr. Nicholas Ozor	6
2.3 Welcoming Remarks- the ATPS Board of Directors- Prof. Crispus Kiamba.....	6
2.4 Opening Remarks from our Partners	7
2.5 Opening Keynote Address on “Using Science, Technology and Innovation as a means for achieving the Sustainable Development Goals in Africa- Dr. Ouedraogo Mahama.....	9
2.6 Official Opening by the Chief Guest of Honour- Dr Moses Rugutt representing Prof. George Magoha, CS Ministry of Education, Kenya.....	10
2.7 Panel Discussion.....	11
3. KEY NOTE PRESENTATIONS.....	14
3.1 Science, technology and innovation priorities for Africa’s development by Dr. George Essegbey - CSIR	14
3.2 Funding Science, Technology and Innovation priorities for Africa’s development by Dr. Akanimo Odon	16
3.3 Improving Intra-Africa trade using Science, Technology and Innovation by Dr. Robert Ochola....	17
3.4 The fourth Industrial Revolution and Africa’s readiness (Smart Ecosystem for Innovation, technology and knowledge growth in Mozambique) by Samuel Partey	19
3.5 Gender and Inclusivity in Science, Technology and Innovation by Prof. Agnes Mwang’ombe.....	20
3.6 Proposed Plan for Acceleration of Medical Training through Enhanced Enrolment, Out-Turns in Reducing Shortage of Physicians in Nigeria by Christopher Enyioma	22
3.7 Leveraging Fourth Industrial Revolution (4IR) to Drive Africa’s Transformation by Dr. Julius Gatune.....	22
4. BREAK-OUT SESSIONS	23
4.1 From ‘Communicating’ To ‘Engagement’: Sustainable Agriculture and Afro-Relationality Framework for Climate Change Communication by Dominic Ayegba Okoliko	23
4.2 Effects of Land Use Change on Soil Quality in Mai Mahiu Ecosystem in Naivasha Sub-County, Kenya by Caleb Basweti.....	24

4.3 Harnessing the power of technology: The state of women in the 21st century UMULUMGBE ODO performance by Dr. Gloria Ozor.....	24
4.4 Gender-Based Analysis on ICT Accessibility and Utilization for Enhanced Performance among Undergraduate Students in Ogun State, Nigeria-Dr. Esther Oshionebo.....	25
4.5 Achievements and Challenges from African Technology Policy Studies Network by Eswatini National Chapter: A Success Story- by Prof. Musa Dube.....	26
4.6 Climate Change and Sustainable Development Focus on Sahel and Sahara Region of Africa: Sustainability Analysis Study for Pan African Agency on Great Green Wall (PAGGW) by Dr Magnus C. Onuoha.....	27
4.7 Healthcare Services Satisfaction in the prison: a cross-sectional survey and comparative analysis of inmates' perspectives in an African country by Ochonma, Ogbonnia G	29
4.8 Providing Off-Grid Solar Light to rural areas in Sierra Leone by Kelleh Gbawuru	30
4.9 Presentation of the Communique-by Dr Ernest Acheampong.....	31
5. ATPS @25-SILVER JUBILEE	32
5.1 Presentation ATPS@25: The Journey So Far- Dr. Nicholas Ozor-Executive Director	32
5.2 Remarks from Key Stakeholders	32
5.3 ATPS Awards Ceremony	33
6. CONCLUSION AND RECOMMENDATIONS	34
ANNEXES	35
Annex I: Programme	35
Annex II: Communique	42
Annex III: ATPS Silver Jubilee Awards Recipients.....	45
Annex IV: List of Delegates	48

Acronyms and Abbreviations

4IR	Fourth Industrial Revolution
AAS	African Academy of Sciences
AERC	African Economic Research Consortium
AESA	Alliance for Accelerating Excellence in Science in Africa
AfDB	African Development Bank
AFREXIMBANK	African Export Import Bank
AI	Artificial Intelligence
ATPS	African Technology Policy Studies Network
AUC	African Union Commission
AURG	African Union Research Grant
CARI	Coalition for African Research and Innovation
CSIR	Council for Scientific and Industrial Research of Ghana
EATPS	Eastern and Southern Africa Technology Policy Studies
GDP	Gross Domestic Product
GMES	Global Monitoring for Environment and Security and Africa
ICT	Information Communication Technology
IDRC	International Development Research Centre
INBAR	International Bamboo and Rattan Organisation
IoT	Internet of Things
KENIA	Kenya National Innovation Agency
KFCB	Kenya Film Classification Board
KPI	Key Performance Indicators
NACOSTI	National Commission of Science, Technology and Innovation
NIS	National Innovation System
NRF	National Research Fund
NTM	Non-tariff measures
PAGGW	Pan African Agency on Great Green Wall
R&D	Research and Development
SEI-Africa	Stockholm Environment Institute-Africa Center
STI	Science, Technology and Innovation
VR	Virtual Reality
WAGEDI	West African Green Economic Development Institute
WATPS	Western Africa Technology Policy Studies

Acknowledgement

The African Technology Policy Studies Network (ATPS) acknowledges the financial support received for the Annual Forum, Conference and Silver Jubilee celebrations from the AFREXIMBANK, Kenya Film Classification Board (KFCB), African Economic Research Consortium (AERC), Stockholm Environment Institute (SEI-Africa) and the African Academy of Sciences (AAS). Special thanks to the Raw Materials Research and Development Council of Nigeria, the Government of Nigeria and Kenya for their continuous support.

We acknowledge their contribution and facilitation services provided by Dr. Maurice Bolo of Scinnovent Center, Dr. Ernest Acheampong of International Network for Bamboo and Rattan (INBAR) during the two-day conference. The interventions from the ATPS National Chapter coordinators are also appreciated. We also take this opportunity to thank the ATPS staff who were very critical in the preparations for this event led by Dr. Nicholas Ozor and including Alfred Nyambane, Felix Musila and Rachel Nzambi.

Finally, we are grateful to all the delegates for their enthusiastic contributions during the two-day event. They deeply enriched the debates and deliberations and also provided great case studies and evidence of STI work through their paper presentations and plenary contributions. We look forward to working with them in promoting STI for desirable outcomes of sustainable development in Africa.

Executive Summary

The African Technology Policy Studies Network (ATPS) organized the ATPS@25 Annual Forum, Conference and Jubilee Celebrations on the 30-31 October 2019. The two-day event themed “*Using Science, Technology and Innovation as a means for Achieving the Sustainable Development Goals (SDGs) in Africa,*” brought together stakeholders including network members, donors and financiers, beneficiaries and government officials across Africa. Over 100 delegates from across the 54 African countries and beyond attended the event. The delegates were drawn from the academia and research institutions, policymakers and high-level government officials, organized private sector actors, informal sector, civil society actors, development partners, donors and financiers, and the Fourth estate among many others. The event adopted participatory approaches to engage stakeholders in relevant discussions and also conference paper presentations and discussions. For the main theme and sub-themes, there were high-level presentations by experts in the field and panel discussions on some of the sub-themes. Enough time was allocated for stakeholder discussions and dialogue on the different sub-themes. The sub-themes included:

- a) Science, technology and innovation priorities for Africa’s development
- b) The Fourth Industrial Revolution and Africa’s Readiness
- c) Improving Africa’s Intra-Africa Trade using science, technology and innovation
- d) Funding science, technology and innovation priorities for Africa’s development
- e) Gender and inclusivity in science, technology and innovation

The main goal of the Annual Forum 2019 was to convene a critical mass of STI stakeholders from Africa and beyond to further discuss how STI can be deployed more effectively to achieve most of the development agenda in Africa including the Sustainable Development Goals (SDGs), Africa’s Agenda 2063, the African Development Bank (AfDB) Hi-Five Priorities, and the national development agenda and visions in African countries. We used the opportunity to tell ATPS’s story as the premier STI organization and how far ATPS has fared in its mandate of using science, technology and innovation as a means for achieving sustainable development in Africa. Most specifically, we aimed to achieve the following during the event:

- i) Present and discuss relevant and topical issues on how STI can be further deployed to more effectively achieve sustainable development in Africa
- ii) Tell ATPS’s story in championing STI development in Africa for 25 years
- iii) Relaunch the ATPS Phase VIII Strategic Plan 2017-2022
- iv) Provide opportunities for networking among STI stakeholders across the continent and beyond.
- v) Present papers that address the main theme and subthemes of the conference
- vi) Celebrate and honour ATPS Legends and Champions

All the above aims were achieved and all the delegates looked forward to achieving more and hoped to be lucky enough to celebrate the Golden Jubilee. A communique was issued at the end of the conference and song and dance celebrations started with the honouring of ATPS champions and a cake cutting ceremony.

1. INTRODUCTION

1.1 Overview of Science and Technology in Africa

The development of and attention to science and technology in Africa took centre stage in the 1980s with African governments making commitments through their Heads of States to allocate at least 1% of their gross domestic product (GDP) to research and development (R&D) as well as scientific and technological capabilities in what is popularly known as the Lagos Plan of Action for the economic development of Africa 1980-2000. This was against the background that Africa at that time was unable to point to any significant growth rate or satisfactory index of general well-being for almost two decades. Faced with this situation, and determined to undertake measures for the basic restructuring of the economic base of the continent, the African leaders resolved to adopt a far-reaching regional approach based primarily on collective self-reliance which included putting science and technology in the service of development by reinforcing the autonomous capacity of our countries in this field. They noted that the role of science and technology in integrated rural development requires among other things the generation of financial resources and political will and courage on the part of policy and decision-makers to induce a profound change with far-reaching effects on the use of science and technology as the basis of socio-economic development. A well-developed science and technology base and its appropriate application will lead to developments in other sectors such as agriculture; transport and communications; industry, including agro-allied industries; health and sanitation; energy; education and manpower development; housing, urban development and environment among others. Countries were urged to develop appropriate policies and programmes that will utilize the power of science and technology to sustain growth and development. Among the early adopters in the development of science and technology policies since the Lagos Plan of Action were Ethiopia (1992), Tanzania (1996), Zambia (1996), Botswana (1998), Nigeria (1998) and Ghana (2000). Other countries followed later.

One very remarkable outcome of the Plan of Action was the support and strengthening of regional and sub-regional science and technology organizations in Africa with a call to Member States and international agencies to provide resources to enable them attain full operational levels. It was during this period that two distinct networks emerged in Africa: the Eastern and Southern Africa Technology Policy Studies (EATPS) and the Western Africa Technology Policy Studies (WATPS). These networks promoted and advocated for the use of science and technology as a means for achieving socioeconomic development in the regions. They facilitated the development of most of the science and technology policies in most of the African countries earlier mentioned. However, in 1994, the EATPS and WATPS came together under one platform that led to the birth of the African Technology Policy Studies Network (ATPS) with its secretariat in Nairobi, Kenya under the East and Southern Africa Regional Office of the International Development Research Centre (IDRC).

1.2 The Role of African Technology Policy Studies Network (ATPS)

The ATPS has since then grown in leaps and bounds. In 2001 ATPS became an autonomous international organization with diplomatic status in Kenya and working on transdisciplinary science, technology and innovation (STI) themes for African development. Whilst retaining the STI focus, ATPS has moved towards a “*knowledge for development*” network of researchers, policymakers, private sector and civil society actors that promote the generation, dissemination, use and mastery of science, technology and innovation for Africa’s development, environmental sustainability and global inclusion. We implement our programs through members in National Chapters established in 30 countries (27 in Africa and 3 Diaspora Chapters in Australia, United States of America and the United Kingdom) with partnerships across the entire 54 African countries. The ATPS is unique in many ways: It is not only the premier STI institution in Africa; it is unique in the composition of its membership, institutional structures and implementation activities. Today ATPS is made up of over 1,500 members spread across 51 countries in 5 continents. As the premier STI institution in Africa, it has successfully mainstreamed STI in African development policy dialogues and assisted many African countries to formulate STI policies as well as develop strategies for its implementation.

Our work is guided by the needs and aspirations of our stakeholders across Africa which we usually put together in consultation with these stakeholders as a Strategic Plan over five year periods. During the current ATPS Phase VIII Strategic Plan (2017-2022), we identified **four thematic and five programmatic priorities of action**. The **four thematic priorities** are: *Agriculture, food and nutrition; Energy; Climate change and environment; and Health innovations*, while the **five programmatic priorities** include: *STI policy research, policymaking and advocacy; Training, sensitization and capacity building; Youth and gender empowerment; Knowledge brokerage, management and commercialization; and Intra-Africa and global collaboration and partnerships*. Details of these themes and programmes are available online at: https://atpsnet.org/wp-content/uploads/2017/12/ATPS-Phase-VIII-Strategic-Plan-2017-2022_Final.pdf. These strategic priorities (thematic and programmatic) align very well with most of the development agenda in Africa including the Sustainable Development Goals (SDGs), the Africa’s Agenda 2063, the African Development Bank (AfDB)’s Hi Five Priorities, and the national development agenda and visions in most of the African countries. The ATPS has benefitted and continues to enjoy the support from many development partners, donors and governments at various levels in the achievement of our mandate.

1.3 Conference Theme and Sub-themes

Five inter-related priority subthemes have been identified to buttress the main goal of the Annual Forum, Conference and ATPS Silver Jubilee. Papers were invited from experts under the subthemes.

Sub-themes:

- i. **Science, technology and innovation priorities for Africa’s development**- This sub-theme focuses on how STI is driving Africa’s development Agenda in the context of STISA 2024 and in achieving the SDGs on the continent. As the African Union has

developed a long-term agenda 2063 for the continent, science, technology and innovation is playing a major role. The strategy aims to address the challenges that hinder development in critical sectors such as agriculture, energy, environment, health, infrastructure, mining, security and water using STI. What does Africa need to do to enhance the use of STI as a means for achieving the sustainable development goals? Has STI been mainstreamed enough in national development agendas in Africa in terms of investments, research and policy?

ii. The Fourth Industrial Revolution and Africa's Readiness- The fourth industrial revolution is the current and developing environment in which disruptive technologies and trends such as the Internet of Things (IoT), robotics, virtual reality (VR) and artificial intelligence (AI) are changing the way we live and work. This year's (2019) World Economic Forum theme of *Globalisation 4.0* addressed the fourth industrial revolution which is taking place globally at an unpredictable rate. Is Africa ready? How effective is the infrastructure in Africa to support these disruptive technologies that will enhance the fourth industrial revolution? Do African countries have enough capacity to exploit these emerging technologies? What needs to be done to support the use of these disruptive technologies in Africa?

iii. Improving Africa's Intra-Africa Trade using science, technology and innovation- There are many reasons for the low intra-African trade including: weakness of physical and human infrastructure, small size of individual African country markets, residual tariffs and onerous non-tariff measures (NTM) on processed and semi-processed African products by both developed and emerging markets, export constraints and other pre-border barriers, absence of trade finance, institutional constraints on enterprise growth and inability to achieve scale, currency risk, corruption and rent-seeking clientelism, and civil disruption among many others. The abundance of interest, capital, opportunities, and promises in technology such as artificial intelligence (AI) reminds one of mobile technology just 10 years ago. Mobile money transfer technology took the continent by storm but this has not translated to significant increases in intra-Africa trade due to the different levels of adoption of the technology in Africa as well as challenges in the development of the required infrastructure. Will technology/automation and AI do to African nations over the next decade what mobile technology did to them in the last one, fuelling a dramatic rise in connectivity and unlocking significant gains in economic development? Like mobile technology and communication capabilities, will technology/automation and AI permit African nations to dramatically increase their research, development, and production capabilities? Will technology/automation and AI give African nations even more power to leapfrog the need for old-fashioned infrastructure and outdated strategies of industrialization? In essence, how can intra-Africa trade be realized using STI?

iv. Funding science, technology and innovation priorities for Africa's development- African leaders have always committed to increasing funding for national, regional and continental programmes for science and technology and support the establishment of national and regional centres of excellence in science and technology. So far only a handful

of the countries have implemented that. Funding for research in Africa is still very low hence very low emergence of new technologies and innovations. This has severely limited growth and development in Africa. How can African governments increase funding to STI? Has the private sector sufficiently contributed to funding research in Africa? Are the African universities and research organizations contributing enough in funding research in Africa? How can development partners significantly contribute to STI development in Africa?

- v. **Gender and inclusivity in science, technology and innovation-** The persistent gender inequalities and exclusivity in Africa can be explained by lack of relevant policies, inadequate and improper curriculum content and strategies, poor didactic materials and negative culture and attitudes which discourage women from training and/or working as scientists, technologists or engineers and the youth from assuming high positions of authority in the polity. This theme focuses on identifying successful international best practices that should be learned, adapted and wisely implemented in Africa to encourage inclusivity and gender mainstreaming in STI. The gender mainstreaming of science and technology policy formulation and review processes have not been sufficient enough to reflect the level of gender awareness that has been created and attitude changes made. What actions need to be taken to ensure there is gender and inclusivity in STI? What data are required to inform decision making on gender inclusivity in STI?

1.4 Conference Objectives

The overall purpose of the conference is to critically examine the current conditions, barriers and opportunities in the above thematic areas and provide policy options for transitions to more inclusive sustainable development in Africa.

- a) Present and discuss relevant and topical issues on how STI can be further deployed to more effectively achieve sustainable development in Africa
- b) Tell ATPS's story in championing STI development in Africa for 25 years
- c) Provide opportunities for networking among STI stakeholders across the continent and beyond
- d) Present papers that address the main theme and subthemes of the conference
- e) Celebrate and honour ATPS Legends and Champions

1.5 Expected Outputs

- i) Published annual forum and conference proceedings;
- ii) A communiqué summarising key recommendations for African policymakers and development partners.
- iii) Two Policy Briefs

1.6 Expected Outcomes

- i) Increased and renewed recognition and deployment of STI as a means for achieving sustainable development in Africa by policymakers, science experts, private sector actors and civil society actors; and

- ii) Strengthened networks amongst STI actors in Africa.

1.7 Conference Methodology

The ATPS@25 Annual Forum, Conference and Jubilee Celebrations was a two-day event that brought together stakeholders including network members, donors and financiers, beneficiaries and government officials from across Africa. The event adopted participatory approaches to engage stakeholders in relevant discussions. For the main theme and sub-themes, there were high-level presentations by experts in the field and panel discussions on some of the sub-themes. In all, there was enough time for stakeholder discussions and dialogue on the different subthemes. About 100 delegates from across the 54 African countries and beyond attended the Annual Forum, Conference and ATPS Silver Jubilee celebration. Delegates were drawn from the academia and research institutions, policymakers and high-level government officials, organized private sector actors, informal sector, civil society actors, development partners, donors and financiers, and the Fourth estate among many others. A detailed programme of the event is provided in *Annex 1*.

Key programme of events:

- Opening ceremony and key messages from donors, sponsors and partners
- A Masterclass on the theme: *Using Science, Technology and Innovation as a means for Achieving the Sustainable Development Goals (SDGs) in Africa*
- Expert panel discussion
- Plenary presentations on the selected sub-themes
- Celebration of ATPS champions and legends. All Foundation Members of the ATPS, past Executive Directors and Directors, Chairs of ATPS Board of Directors, Core Donors, etc. will receive honours awards.
- Exhibition of science, technology and innovation products and services from around Africa

2. OPENING CEREMONY-SETTING THE CONTEXT

This session was chaired by Prof. Joseph Obua, former ATPS National Chapter Coordinator for Uganda and moderated by Dr. Maurice Bolo of Scinnovent Centre and Dr. Ernest Acheampong of International Bamboo and Rattan Organisation (INBAR).

2.1 Welcoming Remarks from ATPS Kenya Chapter- Dr. Stephen Karimi

Dr Karimi, former ATPS board member of Kenyan Chapter, welcomed all delegates to Kenya and wished all participants a pleasant stay in Nairobi. Before giving his welcome remarks and beginning his role as the chair of the session, he asked delegates to observe a one-minute silence in honour of Mr. Kenneth Aduda who passed on. Mr. Aduda was the immediate former ATPS National Chapter Coordinator for Kenya. Dr Karimi was excited to be able to meet all the delegates across the two (2) days. He welcomed the Executive Director of ATPS Dr Nicholas Ozor to give his welcoming remarks.



2.2 Welcoming Remarks from the ATPS Secretariat- Dr. Nicholas Ozor

Dr Ozor warmly welcomed all delegates for this event and was excited to see most of the delegates that he has not seen for a long time. He praised the ATPS family for holding together to ensure that the ATPS dream goes on. He thanked the partners and donors who have continued to support ATPS. He particularly appreciated the International Development Research Center (IDRC), African Development Bank, the Swiss government among others. He spoke about the selection of the theme and subthemes for the Conference and their importance. He emphasized on the need to give STI due attention. He gave a sneak preview of the key note presenters for the main theme and the sub-themes and provided the basis for selecting the theme and subthemes. He appreciated the presence of all the delegates and particularly the presence of the Nigerian High Commissioner.



2.3 Welcoming Remarks- the ATPS Board of Directors- Prof. Crispus Kiamba

On behalf of the Board of Directors ATPS and the ATPS secretariat, and all ATPS stakeholders, Prof. Kiamba welcomed all the delegates. He began his remarks by emphasizing the importance of the selected theme for the conference. He reiterated the importance and the role of Science Technology and Innovation in achieving Sustainable Development Goals (SDGs). He linked the goals with the ATPS thematic priority areas as contained in the ATPS strategic plan. These priority sectors are Agriculture and Food Security, Energy, Climate change and Environment and Health. He thanked all those who have contributed to the growth of ATPS to become the number one Think Tank in Africa. He also thanked all the donors and partners who have been supporting and continue to support ATPS in its work. He mentioned a few examples of efforts made so far to support innovations in Africa. He particularly mentioned the African



Mathematical Institute which is based in Cape Town. One project that he was part of is the African SKA (Square Kilometer Array) project which involved the Southern Africa countries, Kenya and Ghana. An organization called Africa Brains was formed to promote innovation especially on ICT across Africa. He ended his remarks by recognizing the contribution of ATPS partners and donors for their support.

2.4 Opening Remarks from our Partners

2.4.1 Dr Christiane Abu Lehaf, AFREXIMBANK



Dr Christiana read the key note speech on behalf of Prof Benedict Oramah, the President of the African Export-Import Bank (AFREXIMBANK). The Bank has continued to support STI in African. It has continued to support the ATPS whose mandate is to promote STI in the continent. The AFREXIMBANK in its strategy Impact 2021 which was launched in 2017 which is premised on 4 strategic pillars. These pillars are: *Intra Africa trade, Industrialization and Export development, Trade Finance Leadership and Financial Soundness and Performance*. AFREXIMBANK strategy strongly focuses on partnering with ATPS and other partners will bring about the Africa we want in the next decade. She challenged all the participants to ensure that this day will be seen in the next 1000 years as the turning point that enabled our continent to overcome technology challenges.

2.4.2 Prof. Njuguna Ndung'u, Executive Director, African Economic Research Consortium (AERC)



Prof Njuguna Ndugu provided a brief background on how ATPS and AERC were formed and how they partnered with each other through the support of IDRC. This support created very important people who understand the terrain they work through. ATPS and AERC have similar objectives of promoting the use of science and technology to solve Africa's problems. On the policy front, the two organizations have worked to build the capacity of Africans on policy development. He pointed out that if the states have no capacity to absorb the new technologies being developed there would be a parallel market and therefore the countries will not have the ability to solve the problems they face or have the efficiency to solve them. He added that technology should be used to affect the real economy and helping to resolve the challenges in Africa. African problems are dynamic and require dynamic solutions. The work of AERC and ATPS over the years have yielded results that are very visible today in terms of capacity buildings work and the policy landscapes in Africa.

2.4.3 Dr Ezekiel Mutua, MBS, Chief Executive Officer, Kenya Film Classification Board (KFCB)



Dr Ezekiel Mutua started his remarks by congratulating ATPS for achieving this milestone. He was happy to support the event organized by ATPS and hailed the partnership between the two organizations. This engagement is in line with KFCB goal of broadening engagement with stakeholders and deepen policy formulation efforts. He recognized the importance of youth in

engaging in technology change that promotes their businesses. Digital migration in the country has extremely revolutionized many things. KFCB is happy to partner with ATPS in policy research and utilize the expertise in ATPS to better KFCB work in the future. He urged the participants to interact more with governments to ensure that roadside declarations end and ensure governments are accountable for their commitments. He urged African governments to use research to back the policy decisions they make. He challenged African governments and the youth to take advantage of the digital space to do business. He concluded his remarks by quoting Thomas Friedman in his book, *The World is Flat*- “*Every morning in Africa, a gazelle wakes up. It knows it must run faster than the fastest lion, or it will be killed. Every morning a lion wakes up. It knows it must outrun the slowest gazelle, or it will starve to death. It doesn't matter whether you are a lion or a gazelle. When the sun comes up, you better start running.*”

2.4.3 Dr Alphonus Neba Representing African Academy of Sciences (AAS)



Dr Alphonus Neba started by apologizing on behalf of the AAS president and the Executive Director of AAS. He thanked the organizers for extending the invitation to AAS. Dr Neba noted the similarities between ATPS and AAS in terms of mandates and the kind of stakeholders the two organizations work with. He urged Africans and African leaders to change the trajectory as far as sustainable funding for STI. AAS has tried to shift the centre of gravity for funding STI in Africa which will go a long way in addressing Africa developmental challenges. He noted that we rely so much on external funding of STI. AAS implements many programmes under STI with the belief that excellence breeds excellence. Some of the programmes mentioned are Alliance for Accelerating Excellence in Science in Africa (AESA), Coalition for African Research and Innovation (CARI), Fellows of the African Academy of Sciences, AAS Open Research among others. He ended his remarks by wishing the ATPS a fruitful meeting.

2.4.4 Dr Philip Osano Stockholm Environment Institute-Africa Center (SEI-Africa)



Dr Philip Osano was very pleased to partner with ATPS in this event and congratulated ATPS for achieving that milestone. He pointed out that SEI works very closely with ATPS in issues relating to STI and how these impact on development especially on issues to do with Natural resources management and conservation. He provided a brief on how SEI was formed and its mandate. SEI was particularly interested in the sub-theme on Intra Africa Trade and how STI can be used to promote both inter and intra Africa trade.

2.5 Opening Keynote Address on “Using Science, Technology and Innovation as a means for achieving the Sustainable Development Goals in Africa- Dr. Ouedraogo Mahama



Dr Ouedraogo Mahama, Director, Human Resource Science and Technology, African Union Commission (AUC) presented a keynote address on the main theme. He began his presentation by quoting President Kwame Nkrumah in his first speech at the founding Summit of the Organization of African Unity (OAU), Addis Ababa, 24 May 1963.

“It is within the possibility of science and technology to make even the Sahara bloom into a vast field with verdant vegetation for agricultural and industrial developments”.

Dr Mahama provided a snapshot of African statistics: Africa is the second-largest continent (about 6% of the world) with 20 % of the world emerged land. It is made up of 55 countries covering 30,415,873 km². Africa is the second most populous continent with an estimated population of 1.216 billion people which is about 17.44% of the World Population.

He detailed the content of Agenda 2063-the Africa we want and the role of STI in achieving the aspirations of this Agenda. He gave a few examples of how STI is helping drive the implementation of Agenda 2063. As part of the Agenda for Africa, the STISA 2024 provided a roadmap for STI in achieving the SDGs whose mission is *to accelerate Africa’s transition to an innovation-led, Knowledge-based Economy*. He elaborated on the 4 pillars of STISA 2024. The pillars include building research infrastructure, enhancing technical and professional competencies, innovation and entrepreneurship and providing an enabling environment for STI development in Africa.

Artificial Intelligence and Space technology featured more prominently in his presentation. He reiterated the importance of working together as Africa to achieve this. There is some progress in terms of policy for space technology. The African Space Agency was formed and is being hosted by Egypt. He gave an example of the projects initiated by AUC such as the Global Monitoring for Environment and Security and Africa (GMES) a flagship programme of the African Union under the African Space Policy and Strategy. It prescribes a pathway for the continent to be globally competitive in space activities, including Earth Observation, and to develop a viable continental space programme. With continent-wide coverage, the programme is implemented through grants to African institutions under the banners of regional consortia. 13 consortia representing a total of 72 African institutions have been awarded grants through open competitive bidding to implement projects in water, natural resources, marine and coastal areas management.

In supporting research, the AUC has put calls for proposals – Research for Development-African Union Research Grant (AURG). In this call, STI must be used as a catalyst in the designed proposals for sustainable development in Africa. Full participation of the African Member States and African researchers in the implementation of the STISA-2024, Agenda 2063. AUC is committed to the creation of competitive Pan-African Research Grants, promoting Inter-Africa and international cooperation in research and capacity building as well as building Africa’s research capacities through direct funding.

2.6 Official Opening by the Chief Guest of Honour- Dr Moses Rugutt representing Prof. George Magoha, CS Ministry of Education, Kenya



The Official opening speech from the Cabinet Secretary, Ministry of Education Kenya was read by Dr. Moses Rugutt the Director General of National Commission of Science, Technology and Innovation (NACOSTI) on behalf of Prof. George Magoha who could not make it to the event due to other commitments. Prior to reading the speech by the Cabinet Secretary, Dr. Rugutt responded to the issues of funding especially in Kenya and the efforts being made to reach the required 1% of GDP committed to funding Research as per the Lagos agreement of 1980. It was informed that the process of lobbying lawmakers to approve and implement the budget is difficult despite the will to commit those funds by the government. There was an improvement from 0.4 to 0.79 percent for Kenya. In fact, there is a policy that Kenya provides for the government to put aside 2% of GDP in research and development. A huge chunk of the funds committed is used for administrative purposes rather than the research itself.

In his speech, Prof. Magoha was honoured to officiate the opening of ATPS Annual Forum, Conference and Silver Jubilee Celebrations. He lauded the selection of the theme for the conference and its subthemes. He also lauded the selection of Dr. Mahama, the Director of Human Resources in the AUC to give a keynote paper on STI in Africa as very critical. He acknowledged the role ATPS has played in promoting STI in Africa and pointed out that ATPS and the various ministries and institutions that have been working with ATPS in the last 25 years. The work of ATPS has made it to be a premier number one Think Tank in Africa and a Champion in promoting STI in Africa. The CS pledged to continue working with ATPS to promote the use of STI for the development and achievement of the SDGs in Kenya. The Government of Kenya has made strides in promoting STI in Kenya by forming NACOSTI, Kenya National Innovation Agency (KENIA) and National Research Fund (NRF). Recognizing the role of STI in the socio-economic transformation of countries, Prof Magoha noted that NACOSTI launched a Strategic Plan. It is a five-year plan focusing on regulation of research; advisory services for research; knowledge management and institutional capacity. The initiatives in these four key areas is being implemented through annual work plans, and a performance management system put in place to ensure accountability of results. The plan is derived from global and regional goals such as the African Union's Agenda 2063 and SDGs. Besides the launch of the Strategic Plan, NACOSTI also unveiled National Research Priorities 2018-2022. In addition, ATPS has an existing MoU with NACOSTI to support STI development in Kenya in terms of capacity building and policy.

To address the macroeconomic and social challenges and achieve the transformation to a knowledge-based economy, priority sectors in which STI is being strategically integrated to create technology platforms for enhanced productivity growth were identified. They include: Agriculture; Health; Trade and Industry; Mining; Infrastructure; Energy; Environment; Information Communication Technology (ICT); and Space Science Technology. The CS provided details of how Kenya has worked across the five (5) sub themes. For example, Kenya has committed to reach 2% of research funding by 2030. He committed that his Ministry will

continue working with ATPS and other like-minded institutions to promote use of STI in fostering sustainable development. On behalf of the CS, Dr Rugutt officially declared the ATPS Annual Forum, conference and Silver Jubilee officially opened.

2.7 Panel Discussion

This discussion was moderated by Dr. Maurice Bolo who gave a summary of the emerging issues from what was presented by the keynote speaker as well as the speech made by the Education Cabinet Secretary Prof. George Magoha. These included the issues of R&D investments and Funding of STI in Africa, Capacity and Knowledge production, foreign direct investments and the role of the Private Sector and collaborations. The panel of experts consisted of Prof Michael Madukwe from the University of Nigeria Nsukka, who is also the ATPS National Chapter Coordinator for Nigeria, Prof. Sylvester Atanga of the University of Buea, Cameroon and also the ATPS National Chapter Coordinator for Cameroon, Dr. Jemimah Onsare the Ag Director General of National Research Fund, Kenya and Prof. Crispus Kiamba, the Ag. Chairman of the ATPS Board of Directors.



Prof. Michael Madukwe submitted that traditionally, African universities used a curriculum that did not solve African problems. Most of the research in the university is not based on real problems. This is carried on to governance, military, civil service, politics and even academics. Research should be targeted to solving problems not to award degrees but to solve problems. The curriculums need to be revised and research approach should be revised and targeted to solve problems.

Knowledge generation should be the means to solve African problems if only the research that generates the knowledge is well-targeted to solve the specific problem. This then will contribute to global knowledge.



Prof. Sylvester Atanga responded to the question whose knowledge. He acknowledged that Africa has enough professors, PhDs, Masters etc. but when there is a problem, how do these people help in solving these problems? Knowledge needs to be packaged well and good strategies deployed in the communities for it to be effectively used to solve problems. Involving the community is critical since there is traditional knowledge that needs to be used in addition to modern knowledge. Technology such

as the internet, the mobile phone can enhance this. He emphasized on the need to change the curriculum for the training to be effective and make it more responsive and practical.



Dr. Jemimah Onsare addressed the question of funding in research and the generation of knowledge. Investment in research has not been given priority. Knowledge production is the only way we can grow economically as well as socially. The statistics of how Africa is contributing to Global knowledge is disappointing at about 1.3% yet we are capable to equally contribute to global knowledge. There are good policies and will to contribute but implementation is a major challenge.

There is very low realization from our leaders that investment in research will have an immense impact in the long term. It requires enough investments in infrastructure and capacity building of both technical and human resource capacities. There is need to combine efforts amongst like-minded partners rather than duplicating efforts hence leading to collective responsibility and building synergies.



Prof. Crispus Kiamba addressed the concept of partnership in research such as inter-Africa partnership, inter-continental partnership, private-public partnership among others. He tackled this issue by providing examples of projects that he was involved in. The World Bank and some African countries identified challenges in applied sciences, engineering and technologies directly needed for development in Africa. One of the projects became the African centres of excellence that were based in universities in Africa. The African countries participate in the provision

of funds and not only depend on donors from the first world. The Private sector was brought in to support. For example, in Kenya, the Private sector got involved by working with the top university management to put in funds to support innovation hubs and scholarships. The Private Sector individuals have also been appointed to be part of the board of management of public universities or even chancellors of the universities. Individuals from the private sectors across Africa have played an important role in supporting science technology and innovation in Africa. Examples of individuals who have contributed to supporting STI in Africa include Manu Chandaria, James Mwangi of Equity and Aliko Dangote.

The floor was open for questions and discussion. Mr. Woodwonsen Belete ATPS National Chapter Coordinator for Ethiopia asked about the donor expectations for funding and how the priorities in Africa can be aligned to these in order to access the funds available.

Mrs Nadia Hassan ATPS National Chapter Coordinator for Sudan intimated that the problem is identifying the priorities for Africa. Africa is good at preparing policies and documents in line with donor requirements but we forget about what Africa really needs to move forward in terms of development. Identification of specific technologies that will help us move forward and how to develop and access these technologies is a major hurdle. She urged African countries to embrace technology now that African youth are good users of the internet. African should also work towards developing their own technologies and not depending on importing technology.

The panellists responded to the questions from the floor. Prof Madukwe responded research should be taken where it belongs- solving problems. To do that we need to change our training curriculum. To make this effective, scientists should engage with the end users by identifying solutions for their problem. Prof. Atanga added that we should find ways of using the knowledge that has already been generated. Dr. Onsare commented on the funding mechanisms for research where the researchers should engage in co-funding programmes in order for donors/partners to support their research.

3. KEY NOTE PRESENTATIONS

This session was chaired by Dr. Alphonsus Neba on behalf of Prof. Nelson Torto the Executive Director of AAS. Dr Neba provided some statistics on the status of Africa in relation to Research and Science. He provided various descriptions of Africa given by economists of the years but added that, of interest, is to see how Africa will be described in 2030.

3.1 Science, technology and innovation priorities for Africa's development by Dr. George Essegbey -CSIR



According to Dr. George of the Council for Scientific and Industrial Research of Ghana (CSIR), for Africa to harness the potential of Science, Technology and Innovation (STI) in achieving its development plans, there is need to set STI plans (through policy), and resource mobilization through government commitment and establishing partnerships. There is also need for high-level human resource development and proper legislation and regulations. He enlisted some emerging technologies such as Artificial Intelligence, robotics, 3D printing, the Internet of Things, big data science, nanotechnology, photonics and genomics. He added that for Africa to harness the STI priorities at the national level there is need to involve all stakeholders like the government, civil society, business and academia.

Dr. George gave a brief explanation of the priority areas of STI application: Economic (food and nutrition technology, healthcare and wellbeing application, and renewable energy), Environmental (human settlement, waste management, clean water and biodiversity management), Political (digital mass media, governance infrastructure, peace and security systems and inclusive platform) and Socio-cultural (educational like distance learning, STEM emphasizes like Artificial Intelligence and robotics, creativity, transportation systems and communication networks).

From the world's patents applications patterns for ten years (from 2006 -2016), it was noted that most of the African patents are from non-Africans. It was also evident that there was a drop in patent application, hence a call for the need to promote creativity in Africa. He concluded by saying that Africa's development challenges are daunting –food and nutrition, healthcare and wellbeing, industrialization environmental sustainability. The STI priorities are the emerging technologies which demand serious undertaking to build capacity. A holistic National Innovation System approach to harnessing STI capacity to address the development challenges is necessary.

Case intervention by Mrs. Nadia Hassan, ATPS National Chapter Coordinator, Sudan



Mrs. Nadia said that priorities are all about planning. She said implementations of STI strategies need the involvement of all stakeholders and partners especially the knowledge creators and users. For Instance, the involvement of manufacturers can help identify the industry needs and how technology can be used to solve them.

She added that SDG formulation has pointed out indicators like promoting innovations that assist countries to develop. Additionally, there is need to promote creativity, which starts from education, including technical schools. It was also said that in our universities, there are systems of knowledge transfer to the right beneficiaries. However, there are many university graduates whose efforts are not translated into the final product.

Case intervention by Mr. Benson Zwizwai, ATPS National Chapter Coordinator, Zimbabwe



Mr. Benson said that Zimbabwe had benefited a lot from ATPS activities specifically in policy formulation in science and technology, leading to the drafting of a Science and Technology policy. However, it is faced with challenges in its implementation. It was said that priority should not be in policy formulation alone, but also implementation, monitoring and evaluation, though the greatest challenge is financial resources. He said that emphasis should be put on the role of

universities in contributing to the future of African countries. He added that through the universities, the role of the lecturers, that is, teaching, research and contribution to the community should be made as policy as a contribution to innovation and industrialisation.

A question was posed: What are the real obstacles in transforming Zimbabwe industrially, since it has an educated population and research and development infrastructure? Mr. Benson responded that all universities have innovation hubs. The infrastructure is there but the macro-economic environment poses a serious challenge. He added that Zimbabwe suffers from UN-imposed legal sanctions.

Facilitated discussion from all delegates

With regard to funding of STI priorities for Africa's development, it was said that the Kenyan debate on allocating a certain percentage of GDP to fund research and development, is not practical, since GDP is a representation of national productivity and income, not a representation of income and expenses. It was also said that many African governments do not allow the actual spending on specific STI projects. In conclusion, it was said that African countries should address the realities of their situation, since most researches are more of literature review and not practical.

3.2 Funding Science, Technology and Innovation priorities for Africa's development by Dr. Akanimo Odon



Dr. Akanimo started off the presentation by saying that he considers himself as a navigator between academia, industry and governance. He said the big question to ask ourselves is “is it availability or accessibility of funding?” He added that the idea is, if we are unable to make the government do what is required, we have to grab the bull by its horns. He said that there is money in Africa, but the continent is also faced with many challenges since it allocates little money to funding. He added that if Africa could utilise its resources well, it is in a position to utilise the green economy.

Dr. Akanimo posed the question “Why should government fund research?” He said that for African governments to invest in research there should be returns on the investment (research). He said we should learn to see problems as a strategic resource, research as an innovative product, STI organizations as knowledge enterprises and industry as research partners. He added that, on the world patent map, Africa is non-existent. He said in research we should show the industries we engage with and the problems we have found solutions for. Researchers should understand the funding landscapes by first knowing where their money is. He added that by limiting your place, you limit your space and funding. He said that there is also the need to establish international partnerships for resource mobilisation. Additionally, for eco-innovation, we need to understand the relationship between “knowledge versus money versus power versus rights”. He said drives conversation but private sector in the implementation of policy. So if the private sector is not involved in policy development, then there is a problem.

According to Dr. Akanimo, we need to understand the resources we have, like the student pool that every university has. He added that SMEs should consider advertising their issues or challenges for students’ research. He added that we should grasp the concept of grantsmanship, that is, the knowledge of who gives money or funding. He gave an example, “if you put industry people and researchers in separate rooms and ask each group about the weaknesses of each other, then researchers will say that industry folks like money too much, while the industry folks will say that researchers do not like money. He said that there should be a middle line of compromise. Researchers should develop an entrepreneurial mind-set, since industry goes where there is money (e.g. banks goes to universities and not the vice versa).

Case intervention by Mr. Wondwossen Belete, ATPS National Chapter Coordinator, Ethiopia



Mr. Wondwossen said that it is necessary to have an external source of funding for our innovations. He added that unless we build an innovative capacity externally, funding STI will always be a challenge. He also said that we should count on funding from remittances from Africans in the diaspora to boost STI financing in the continent. He added that it is crucial to establish STI banks in Africa. He gave a caution that we should be careful in utilizing our domestic resources in financing STI in Africa.

Case intervention by Prof. Said Boujraf, ATPS National Chapter Coordinator, Morocco



Prof. Boujraf stated by saying that we should consider partnerships between health and engineering sectors. He said that we should look at strategies for emerging innovations, present new ideas for projects and do capacity building, with the main orientation of targeting innovation and entrepreneurship. He also emphasised on the importance of gender, mainly promoting women in innovations. He said that they had two international workshops in 2015 and 2017, aimed at improving the innovative and entrepreneurial position of the youth.

Facilitated discussion by all delegates

Two questions were asked: (1) Tell us the opportunities inherent in the green economy?

(2) How much involvement of politics of whether Europe can fund Africa or not?

Mrs. Nadia commented that Industries should take it as a social responsibility to fund research and innovations. She said that we need to change our mind-set as researchers of not giving policy briefs to policy makers.

In response, Dr. Akanimo said that the potential for green economy in Africa is enormous in agriculture and aquaculture, among other sectors. He said that you cannot remove the influence of the political arm in the funding of innovations. Good researchers should not bump into lucrative research opportunities by chance if good structures are in place.

This session was concluded by the chair who gave a personal opinion as to why African governments are not funding research and innovation. He said that thinking of the corruption money held in Europe and U.S. banks, then why shouldn't we apply the existing laws for such crimes and confiscate that money and use it for research purposes.

3.3 Improving Intra-Africa trade using Science, Technology and Innovation by Dr. Robert Ochola



Dr. Ochola of AFREXIMBANK started his presentation by showing some pictorials indicating the comparison between Africa and the U.K. at the Iron Age. From the pictures, it was clear that Africa was far much ahead of the U.K, going by the housing structures used then. Then in the 90's something went wrong. Dr. Ochola said that Intra- African trade has remained at 15% for the last 6 years. He said that there are many opportunities in Africa to diversify exports, for instance, creating substitutes of your imports, given our comparative advantage.

Constraints and opportunities to Intra-African trade

Dr. Ochola pointed out that Africa's great challenge is the current infrastructure. He said that we should do some research on African trade, look at our neighbours and know where to source our imports from. For instance, fish imports can be increased internally (within Africa) by increasing the availability of marketing information. He said that information and transaction costs increase the costs of Intra-African imports. He added other imports costs which include; poor infrastructure, poor trade and customs logistics, poor business environment, higher costs

of cross-border payments and high energy costs, with the overall impact of reducing African countries' competitiveness. He one of the energy solutions is green collective transport from a light rail system. Among the success factors for promoting the Intra-African trade he mentioned include; digitization, policy, being responsive (organizations need to be proactive in monitoring), research and development, cross border payments, youth and gender empowerment and capacity building.

Case intervention by Dr. Christiane

Dr Christiane said that Africa should focus on energy as key to market areas. She also explained how Egypt meets its energy requirements by focussing on solar/ renewable energy production. She added that the country should think of exporting the excess energy to other African countries, and utilise it for development in other African countries. She emphasised that we should focus on building the capacities of our African neighbours. She added that Egypt should consider extending its potential investors to other African countries like Nigeria, Ethiopia, Kenya and Uganda. She added that through research and development, Egypt can be a knowledge and technology hub.

Facilitated discussion by all delegates/plenary

Questions by Mrs. Nadia: What is the role of AFREXIMBANK in facilitating trade and financing? Why African banks are not financing development?

It was added from the plenary that African countries are not connected and they block each other, thus limiting Intra-African trade. For this trade to succeed, we need to interact with each other and remove all barriers (citing an example of South Sudan visa). It was also said that copying innovations from other countries are part of innovation. In addition, to facilitate trade in Africa, we have to improve our infrastructure, which makes us attractive in trade. Also, we need some policy changes, since we are well endowed with all-natural resources.

Dr. Ochola submitted that innovation is not about doing something new. He said that African trade is faced with constraints like lack of political will. He added that African Development Banks are mandate driven, but premised on demand. He said that these development banks track developmental outcomes and see how they impact the continent. He emphasised that Africa is not interconnected, citing an example that many investors in Venezuela Park are non-Africans. He added that in our universities we study many things except innovation. He also said that we should have a common vision, for us to move forward and should be educated and confident, be it, politicians or researchers. He added that we should consider promoting our university students and lecturers and work on contextual problems.

3.4 The fourth Industrial Revolution and Africa's readiness (Smart Ecosystem for Innovation, technology and knowledge growth in Mozambique) by Samuel Partey



Samuel Partey of UNESCO representing Ms. Ann Therese Ndong-Jatta, Director UNESCO Regional Office for Eastern Africa, started by giving the key priority areas in the fourth industrial revolution and emerging technologies, like knowing how to use Artificial Intelligence (AI), 3D printing, automation, use of robots, among others to promote innovation. He said priorities are climate change, water, culture (how to promote diversity) and foster digital intelligence. He added that there should be a research centre in every organization. He stated key UNESCO priorities for Africa, which include collaboration with Huawei, and help build education of Artificial Intelligence. He added that some progress has already been made in promoting the use of drones in the supply of blood and medicines. He also talked about the use of drones in speeding up farming activities and the promotion of regional cooperation in STI.

Case intervention by Prof. Eng Alberto Chemane Lourino ATPS National Chapter Coordinator, Mozambique



Prof. Eng. Chemane the ATPS National Chapter Coordinator for Mozambique, intervened that there is a knowledge gap between the developed world and Mozambique, brought about by things like underdevelopment, unemployability, unskilled labour and inequality. This gap can be bridged through smart ecosystem projects like using emerging technologies in schools and universities and bringing experts in technology industries to lecture students. He added that the initiative can be supported by the government through the provision of the internet and the expansion of ICT infrastructure. To achieve this, there is need for support from government ministries and other development partners.

Case intervention by Dr. Wollor Emmanuel, ATPS National Chapter Coordinator, Liberia



He started by elaborating on STI in Liberia and the fourth industrial revolution. He said that the country can benefit from the available natural resources, but their value addition is constraint by lack of human capacity. He also said that we need market-driven curricula in our universities to enable our graduates to secure jobs.

There were some comments and requests from the plenary, directed to ATPS to focus on how to develop capacity for carbon menace, like carbon markets. There was also a request for capacity building collaborations. It was concluded that we have a huge opportunity of defining our curricula to build future capacity for our university graduates.

Dr. Charles Owino of AERC who was chairing the session closed the session with a parting shot. “Technology does not hold all the answers, it raises more questions and all we need to do is to strive to have the right environment for technological innovation through engaging more with policy makers.”



3.5 Gender and Inclusivity in Science, Technology and Innovation by Prof. Agnes Mwang'ombe



According to Prof. Agnes, the Rockefeller Foundation had a major program on gender inclusivity in science. In science, there is under-representation of the female gender. She said that this issue of gender inclusivity (especially women exclusion) is not only a national or regional issue but a global concern. She said that women representation in health science is good but poor in engineering and other hard sciences. She acknowledged that in agriculture, women representation is improving, at around 45%. She added that various foundations such as the Bill Gates foundation are targeting women for scholarships and skills development. She cited the case of Safaricom Company in Kenya, saying that they have tried in ensuring women representation.

She asked a question “What support mechanisms do we have in our universities to bring women in the system?” She cited the case of the University of Nairobi, Kenya, and said they have a support mechanism for both males and females. She added by saying that we should think on how to influence the young minds back at home and bring them on board in science and technology. Additionally, she said we should make businesses out of innovation along with the curriculum. She asked another question “How can we include research and innovation into business?” To achieve this, we need re-tooling of academia. She said that in agriculture, they have set up short term courses and influenced the uptake of seeds from the breeders. She concluded by saying that they need to deal with the legal framework to move the seeds to the users.

Case intervention by Mrs. Martha Ugwu, ATPS National Chapter Coordinator, UK



She kicked off the presentation by saying that STI and gender equality are equally important in achieving SDGs and Africa Agenda 2030. She said that it is our role to make this a reality in these development agendas. She added that new and emerging technologies affect men and women differently, citing an example of the forum, that no gender equality. She added that this issue of gender inclusivity needs to be addressed in a global discussion for us to understand it well. She also said that it is important to do something to ensure both male and female genders are on the same page and move on in the same rate.

Case intervention by Prof. Musa Dube, ATPS National Chapter Coordinator, Eswatini

Prof. Musa started by asking questions “Is this issue of gender inclusivity a cultural issue?” “A policy?” Yes, but not a panacea. “What is gender/women representation in agriculture among other fields?” For us to understand this issue, we need to ask ourselves some fundamental question:

Where are we coming from?

What is the current status?

Where do we want to take it to?

How are we going to get there?

How do we know that we are on the track?

How do we know that we have reached equity/balance?

Facilitated discussion by all delegates/plenary

Prof. Boujraf asked “What are the basic issues?” He said that Africa has a lot of discrimination in terms of basic education. According to him, if equality is tackled at the level of basic education, then gender inclusivity in research and innovation will not be an issue.

Dr. Nadia said intervened by saying that she doesn’t advocate for gender equality but feminism. She said that we should know when and how to develop women creativity since they are often engulfed in family responsibilities. She gave an example of Sudan where women are highly encouraged to grow in agriculture. She further said that the question is how to encourage inclusivity in STI.

Dr. Ochonma said that gender equality can be tackled through policy or the provision of an equal playing ground, for both male and female genders.

Prof. Speranza said that we should focus more on the opportunities that STI offers to foster gender equality.

Prof. Agnes Mwang’ombe citing a Kenyan example of compulsory basic education said that you cannot keep a child at home, since the area chief will arrest you. She also cited another Kenyan case (though debatable), saying that if a school girl gets pregnant, she is allowed to go deliver, then return to school after delivery. In the same case, if KCPE candidates deliver during examinations, they are allowed to do their examinations in the hospital, while attending to their newborn babies to avoid dropouts.

Prof. Musa added that regarding the policy question, the constitution allows women to own land and have access to loans.

Mrs. Martha responded by saying that women need to be supported in order to make progress in their careers. She further said that to give women an incentive to work from home, we should look at new technologies and ways to enable them, like, using robots. She added that because of the bias that already exists, this should be tackled through policy.

Prof. Mwang'ombe concluded by saying that the work environment for female students in hard sciences should be improved, giving an example of a Ghana University, where student mothers are allowed to breastfeed, then continue with their activities. She also asserted that we should not only support girls but also boys, in order to secure them a good and inclusive future.

3.6 Proposed Plan for Acceleration of Medical Training through Enhanced Enrolment, Out-Turns in Reducing Shortage of Physicians in Nigeria by Christopher Enyioma



In Nigeria, there is a shortage of medical doctors (by 33,000 physicians). Given the population growth at an annual rate of 2-3%, failing to plan is planning to fail. This physician's shortage is a common problem in Africa. To solve this, we should look at the issues of enrolment. The key issues addressed by this paper is writing the estimates of the people required to meet the gap/deficit, and the financial requirements to bridge the gap, that is, the unit cost of producing a medical doctor for a five-year period. From the results of the paper, one doctor is expected to attend to about 1,200 people. Additionally, 60 billion Naira should be spent by the Nigerian government to bridge this personnel gap. If this is done, within 10-15 years, this deficit will be met.

3.7 Leveraging Fourth Industrial Revolution (4IR) to Drive Africa's Transformation by Dr. Julius Gatune



According to Dr. Julius Gatune, we have new technologies with huge implications on unemployment. Africa has a job challenge due to its failure to transform. In Africa, we think of youth as a problem but they are resources. An industrial revolution is more than just a technological leap. Drivers of the industrial revolution include technologies like Artificial Intelligence, learning, computing, processing technologies, machines, robots, block chain technologies, data mining technologies, 3D printing, renewable technologies and other related technologies.

Impacts of 4IR include a rise in labour costs, low productivity due to poor infrastructure, and growth of gig-economy/ part-time jobs. As new technologies are being deployed, African business is a real challenge. Also, our education systems are quite unprepared, meaning our foundation levels are weak. Our infrastructure is also weak, such as low internet penetration/ access, poor quality and high cost of the internet. The regulatory capacity is also weak and is being compounded by politics. Agricultural transformation is a potential pathway. The informal economy can be transformed through platforms, like embedding trust, building skills, leapfrogging, digitization, policies and public investment.

4. BREAK-OUT SESSIONS

4.1 From ‘Communicating’ To ‘Engagement’: Sustainable Agriculture and Afro-Relationality Framework for Climate Change Communication by Dominic Ayegba Okoliko



Climate change poses a significant threat to Africa’s development trajectory; to the social, economic and ecological systems in the continent. The economic landscape of the region depends largely on the performance of sectors such as agriculture, forestry, energy, tourism, coastal and water resource which are highly susceptible to climate change impacts. With governance fragility in the region, climate change risks exacerbate challenges relating to food and water security, health management, economic stability, land use, social and cultural cohesion with implications for agricultural practices. Despite acknowledged Africa’s peculiarities, however, public awareness and engagement on climate change are considered problematic in the region. There is a need to drive campaigns on sustainable agricultural practices that have social, economic and environmental benefits, including meeting the need for increasing food demands. This study interrogates current practices in mediated climate change communication (CCC) as a forum where transformative ideas are shaped. Besides the dominance of non-African epistemologies in literature analyzing the media-climate change and public nexus, there is little attention given to problematizing ‘public engagement’ (PE). Common assumption pitches ‘the public’ on the one side and ‘the communicator’ on the other side. This bifurcated model of ‘communicating’ climate change has import for the forms of subjectivity in climate (in) action, including a weakened citizenship representation in climate discourse and the de-pluralization of ideas. This study argues that because it is people that stand to be engaged in climate campaigns, it is important to draw attention to what understanding of “person” and “community” undergird current CCC practice. Utilising a “conversational method” of inquiring, the paper discusses these concepts from African political philosophy – Afro-communitarianism and Ubuntu – and intersects them with contributions from non-African traditions to tease out implications for reorienting CCC towards “engaging” the public as persons-in-relationship. The paper argues that a relational perspective on our sociality, one which takes into cognizance, context specificity of experience to account for a view of human agent-hood as persons-in-relationship or persons-in-community (1) can inform a media ethic that can counter the normative valence of oppositional discursiveness which mark conventional mediated CCC and (2) provide space for inclusivity of subjectivities within it. The paper contributes to the discussion on the epistemologies of the South and challenges the binary approach to the knowledge economy on climate change.

4.2 Effects of Land Use Change on Soil Quality in Mai Mahiu Ecosystem in Naivasha Sub-County, Kenya by Caleb Basweti



Mr Caleb Basweti, a PhD student from Kenyatta University presented is research by providing a background and rationale for his study. Land-use changes are the main cause of soil degradation and associated human and environmental problems especially in many developing countries in Africa and Asia. Study was conducted in Mai Mahiu, Nakuru County, Kenya whose aim was to assess the impacts of land-use changes on soil productivity and ecosystem functioning. The specific objective was to understand the nature and extent of land use changes/practices and there impacts on soil quality indicators. Landsat archive was utilized was used to detect land-use change from 1985 to 2015 at an interval of 15 years and analysed based on supervised image classification. Results from the study showed a remarkable land-use and land-cover change between 1985 and 2015. Cropland significantly increased by 135% from 27.3 km² in 1985 to 64.2 km² 2015 at the expense natural forest. Built-up area and roads coverage had increased by almost three times from 9.8 to 29.9km². Soil quality deteriorated significantly with land-use change. There were significant differences ($p<0.001$) in soil bulk density that increased from 0.93 ± 0.02 g/cm³ in forest soil to 1.27 ± 0.02 g/cm³ in disturbed grassland. Soil acidity increased significantly ($p=0.002$) with land conversion with pH ranging between 6.19 ± 0.14 and 7.18 ± 0.12 . Soil organic carbon declined significantly ($p=0.008$) with losses of up to 63% while total nitrogen declined significantly ($p=0.005$) from 0.34% to 0.15 with land conversion. Mr. Basweti concluded his presentation by submitting that land use changes and modifications in Mai-Mahiu have negatively affected the soil productivity with a potential drop in other ecosystem services production. For the sake of the present and future generation in this region, He recommended that management decisions should take into consideration an integrated landscape approach, enforcement of relevant laws and policy implementation that are aimed at maintaining the resilience of soil quality attributes for sustaining this type of ecosystem.

4.3 Harnessing the power of technology: The state of women in the 21st century UMULUMGBE ODO performance by Dr. Gloria Ozor



Dr. Gloria started with a pictorial presentation of the Odo masquerade ritual and an explanation of how technology has affected the performance. She said that technology has both positive and negative impacts, socially and communally. She said that integrating technology in this ritual can be a powerful driver for development in the community, socially, economically and environmentally. She added that this can enhance the living standards of the people in the community through job creation and reducing poverty, thus making it economically stable. She added that the use of technology has made the ritual more attractive and impressive.

According to Dr. Gloria, the best way to promote our culture is to use technology to advance it, since this enables them to communicate even outside the community. She said that for women to be able to communicate in such events (which is a way of inclusivity), technology

is key. She added that through technology, youths are being involved especially in social media platforms. She concluded by saying that use of technology is a way of taking traditional beliefs into the modern world.

4.4 Gender-Based Analysis on ICT Accessibility and Utilization for Enhanced Performance among Undergraduate Students in Ogun State, Nigeria-Dr. Esther Oshionebo



According to Dr. Oshionebo, very few women are enlightened while the majority are poor. With regard to the basic education policy in Nigeria, all children should go to school. She said that majority of people in Nigeria have phones, but the question is “how accessible are these gadgets to the minority (poor) among the many (rich). According to her, African traditional/cultural upbringing (the roles of boys versus girls), there is no innovation since the boys are not allowed to do simple innovative chores like cooking. She went ahead to give an example of a situation where the parents’ income reduces, the girl child will drop out of school and leave the boy child to continue with education since traditionally/culturally, a boy’s education is more valued than the girl’s education.

From the study findings of this paper, girls are not courageous enough on ICT, boys are better in ICT, but girls are better academically. Dr. Oshionebo posed some questions “Is it that the girls are more resilient, causing good performance?” “How do we get the boys to do better academically?” According to her, women are excluded in public activities even in the church, since they are perceived to be failures. This makes her wonder whether men have two heads. She added that we need to ensure that girls are given a level playing ground, equivalent to the boys. She concluded by saying that we have a challenge of changing people’s mind-sets, citing a case where girls are considered to be witches when they study sciences and competes with their male counterparts. She also gave an example where a married woman does not deliver a boy in Nigeria, the mother-in-law will advise her son to remarry.

Some comments from the plenary; we should not allow mothers-in-law to tell you what your husband or wife what to do. In addition, we have a great role to play in society and we should not stick to our mind-sets. A key observation; there was quite a heated debate on ICT access in the village and superiority between the male and female genders (with regard to cultural mind-sets in Nigeria). There was also a debate on women engagement in education, which varies depending on the locality or state.

4.5 Achievements and Challenges from African Technology Policy Studies Network by Eswatini National Chapter: A Success Story- by Prof. Musa Dube



Prof. Musa started by congratulating ATPS for the 25th silver jubilee celebration, saying that ATPS deserves it. He went on to highlight the achievements made so far, like surviving testing moments, contradictory reports, lived under the leadership of six executive directors, supported by National Chapters lead by different and/or same national person and surviving local politics in member countries. He also gave some challenges that ATPS has faced like lack of power especially in the rural areas of Eswatini, limited space for students in tertiary institutions, citing e-learning as a potential solution to this challenge.

According to Prof. Musa, smartphones are gaining popularity in Eswatini, hence the need to have a keen interest in the conference's theme "using STI as a means for achieving sustainable development in Africa". He added that the achievements of ATPS are too many to count since they can be ascribed individuals, collectively, nationally and globally. He enlisted other achievements like the capacity building of members, including the National Chapter members, funding research proposals, development of policy on STI, under the Ministry of ICT, promotion of Chapter leaders to higher ranks and giving the chapter Leaders an opportunity to make professional presentations in workshops and conferences. However, ATPS has faced some challenges such as attrition among Chapter members, financial constraints in funding research proposals, finding partners in STI, transforming research findings into innovations (process, product and services), unit to develop research agenda and coordinate, relevance of research conducted and completed, membership turn-over, collaborations among key players in STI, links between science and technology parks and sustainable links among and between key players in STI. He concluded by saying that we celebrate the former and the current Executive Directors. He also commended the board members for good work. He said that he would like to recommend the establishment of a unit to coordinate research, and STI research findings should be transformed into innovations.

Facilitated Discussion

From the plenary, a question was asked to Dr. Gloria Ozor about her presentation, "To what extent does technology appear to reduce the authority of religious leaders/traditional beliefs in the community?" A comment was directed to Dr. Oshionebo's presentation, that we should find a way to replicate what she had done. Dr. Gloria Ozor responded by saying that when the spirits are coming to the world of the living, the women are supposed to remain in-doors. But nowadays, technology is changing it since people can use their phones to communicate. She added that nowadays we have female pastors and nuns. She emphasised that the youths are using technology and even costumes to modernize it.

Dr. Oshionebo responded by saying that it's okay to replicate the study in different places then compare the results. Dr. Nicholas Ozor commented on Dr. Gloria's presentation saying that according to traditions, she has a limit on how much she can talk about the Odo masquerade ritual. He added that she cannot use her personal phone to take photographs of the ritual, and for that reason, she did the study under men's protection.

4.6 Climate Change and Sustainable Development Focus on Sahel and Sahara Region of Africa: Sustainability Analysis Study for Pan African Agency on Great Green Wall (PAGGW) by Dr Magnus C. Onuoha



Dr. Onuoha is the *Executive Director, West African Green Economic Development Institute (WAGEDI), Gregory University Uturu, Abia State Nigeria*. He opened his presentation with a brief introduction on the Pan African Agency on Great Green Wall. According to Dr. Onuoha, the Pan African Agency on Great Green Wall (PAGGW) consisting of 54 countries was formed to enhance environmental sustainability; promote integrated natural resource management; contribute to poverty reduction; create jobs and wealth; as well as minimize desert encroachment into the

hinterland of each other. He said that its mandate also included designing and implementing the programme aimed at controlling land degradations in the arid and semi-arid lands of Africa. He also noted that the multiplicity of the advantages and the expanse of countries in its value chain couldn't be overemphasised.

Dr. Onuoha also indicated that in line with the scope of that project, and also looking at the narrative from above, the prospects of this project in terms of relevance, efficiency, effectiveness, impact, innovativeness and viability, the Sahel and Sahara countries were the main beneficiaries of the value chain provided by the Pan Africa Agency on the Great Green Wall. The countries in this regard were as follows: Algeria, Burkina Faso, Benin, Cameroun, Central African Republic (CAR), Chad, Cape Verde, Djibouti, Egypt, Ethiopia, Eritrea, Gambia, Libya, Mali, Mauritania, Morocco, Niger, Nigeria, Senegal, Somalia, Sudan, South Sudan and Tunisia.

He went on to further add that the methodology of the study was two-fold. The first methodology was Advocacy, Sensitization and Awareness. He said that it entailed building-mass awareness, sensitization and interface sessions for stakeholders in the 23 countries. The other methodology used was to conduct technical baseline studies which entailed identifying terrain types, communities and local weather conditions, soil types and samples, soil and water availability tests, attributes of local population, social attributes along the PAGGW corridor. Dr. Onuoha also spoke on the deliverables /Key Performance Indicators (KPI) which were concurrent with the deliverables. The first set of deliverables under the first deliverable were Stakeholders 1: in the various tiers of Government in all the 23 countries Stakeholders 11: District Councils and Communities along the PAGGW corridors Stakeholders 111: Print & Electronic Media & Civil Societies in all the 23 countries affected.

The second set of deliverables was technical baseline studies reports, soil types and samples, soil and water availability tests reports, demographic reports, population social attributes along the **PAGGW** corridor, meteorological reports, and indigenous plant species reports. Dr. Onuoha added that the other methodology used in the study was Programme Assessment and Sustainability Analysis, which entailed conducting studies on vulnerability sustainability analysis of the programme and the deliverables under this were complete study tours of selected countries within the Shelterbelt/Green Wall (China, Senegal, Niger, Mali, Mauritania) to assess

their programmes, strategies, achievements and challenges. The others were a complete review visits to the 23 Countries in the **PAGGW** as well as Peer Reviews of the take- away from the Study tours and Review Visits. The other one was the Sahel-Sahara Stakeholders Dialogue to provide the platform for the presentation of the Report to all stakeholders.

Dr. Onuoha further enumerated the fourth deliverable which was the establishment of demonstration/ pilot nurseries in select sites within the minor belt and the deliverable was the identification and negotiation for sites for the establishment of demonstration/pilot nurseries, recruitment and engagement of horticulturists, attendants and green rangers, construction of nurseries; purchase of selected plant seedlings. He also said that the fifth deliverable was planting of trees along the major belt and the deliverables entailed the purchase of delivery trucks, and working instruments (shovels, knives, wheelbarrows, booths, overalls etc.), employment and training of tree planters and deployment of tree planters along the major belt.

The sixth deliverable was working to achieve the sustainable water content of **PAGGW** which included the implementation of elements of the framework and modalities for the transfer of water from the proposed sources in the design. The Deliverables under this methodology were rainwater harvesting and dam reservoir transfer facilities, groundwater exploration facilities, water tanker/spray trucks protecting the existing watershed. The last methodology was consultancy services and the deliverables were organized sensitization workshops both national & regional, community/youth relation's centres, engagement of foreign funds application & country qualification with donor agencies & development partners and carbon trading platform.

Facilitated discussion

One question was asked by Dr. Phillip Osano: "Will the PAGWW be an investor in the open carbon market? Dr. Onuoha responded that: Yes, the PAGWW will be an investor having been given an opportunity for the development of the carbon market and also functioning as a shelterbelt. The PAGGW Programme is a 'gold mine' in terms of its carbon sequestration potentialities and other attendant financial incentives from the carbon market model when operational", he said.

In conclusion, Dr. Onuoha noted that the study was in line with the Paris Agreement where all the 23 countries had submitted their Nationally Determined Contribution (NDC) where they made various commitments on emission reduction conditionally and unconditionally in line with globally collective emission reduction targets.

4.7 Healthcare Services Satisfaction in the prison: a cross-sectional survey and comparative analysis of inmates' perspectives in an African country by Ochonma, Ogbonnia G



Department of Health Administration and Management, Faculty of Health Sciences and Technology, College of Medicine, University of Nigeria, Enugu Campus, Enugu State, Nigeria. Ochonma started off his presentation by noting that an assessment of patient satisfaction allows general practitioners and institutions to investigate the extent to which their service meets the needs of their client group. Ochonma also said that

questionnaires that assess specific aspects of service provision enabled the practitioner to identify aspects of the service where patients are less satisfied. He also said that an assessment of patient satisfaction allows general practitioners and institutions to investigate the extent to which their service meets the needs of their client group.

Ochonma opined that in the patients' satisfaction assessment of healthcare services in the prison, it was uncovered that in Enugu prison, the patients were satisfied only with the waiting time before being seen in the clinic, explanation of what to expect during the examination and explanation of what to expect after the examination. He also added that in Ibite-Olo prison, the patients were not satisfied with any of the listed services. The greatest dissatisfaction was on services like timely availability of laboratory results, level of attention provided by the doctor/nurse and the physical appearance of the facilities and the quality of the equipment.

Further, he said that in Oji River prison, the patients were satisfied with services such as in the overall care received, explanation of what to expect after the examination, how questions were answered by the staff, courtesy of the doctor/nurse, adequate explanation in preparation for specific test/examination, level of attention provided by the doctor/nurse and waiting time before being seen in the clinic.

Ochonma said that in general, he found out that for all prisons put together, the patients were dissatisfied with all the listed services. Greater dissatisfaction was on services such as: the physical appearance of the facilities and the quality of the equipment and timely availability of laboratory result. He also went on to further add that the comparisons between sex groups on satisfaction of prison health care services for the different prisons and all the prisons put together showed that in Ibite-Olo and Oji River, there were no female patient participants; hence no statistic was computed in both. However, both for Enugu prison and for all the prisons put together, there was significant satisfaction difference between the sex groups the women having recorded higher satisfaction level.

Case intervention by Kelleh Gbawuru, ATPS National Chapter Coordinator, Senegal

Kelleh Gbawuru was of the opinion that the result of this study expressed the general state of disarray of the Nigerian healthcare system where majority of the citizens have lost faith in the capacity of the health system to come to their rescue. He further added that Nigeria invests as

little as 4-5 percentage of her gross domestic product (GDP) providing for healthcare services and this is way below World Health Organization (WHO) recommendation.

In conclusion, Ochonma suggested that there should be a true re-think about reforming the healthcare system to maximize its productivity as to providing answers to myriads of healthcare problems in Nigeria.

4.8 Providing Off-Grid Solar Light to rural areas in Sierra Leone by Kelleh Gbawuru



Kelleh kicked off the presentation by providing the overview of the project. He noted that the project is designed to use solar PV lanterns to provide basic lighting in rural areas of Sierra Leone (Kychom, Kambia District, Northern Sierra Leone) where conventional methods of electrification cannot be economically justified. Kelleh also added that rural electrification forms an integral part of Sierra Leone's overall rural transformation and poverty reduction in that less than 1% of the rural population had access to electricity.

The solar lantern project had 6 sub-stations with several components. The first component was 50 portable solar lanterns. Each lantern uses LED-based luminaire and plastic enclosure that contains a rechargeable battery and necessary electronics. The other one was 5 junction boxes housing charge controllers. Each junction box has 10 sockets to plug-in the leads for an individual solar lantern. The last one was 580 W Solar panels each connected to a separate junction box.

Kelleh also went on to further note that the project had a significant impact on the local community. For example, in the education sector, the motivation of teachers and students of Kychom schools improved. Again, there was increased attendance rates, improved academic performance and the development of adult functional literacy activities. Also, the success rate of students in the national examinations increased by 60% and enrollment doubled. Businesswise, small and medium enterprises were now able to open up for longer periods of time as there was sufficient lighting.

In regards to the sustainability of the project, Kelleh noted that the income generated from lantern rental and mobile phone charging was used to pay the salaries of employees and maintain the systems. He further noted that the default rate was zero. In conclusion, Kelleh noted that the project had a huge potential impact if only upscaled by way of resourcing it more.

Case intervention by Uzochukwu Okafor, ATPS National Chapter Coordinator, Namibia

Prof. Okafor generally noted that it is necessary to have a wide external source of funding for our innovations. He added that unless we build an innovative capacity externally, funding STI will always be a challenge. He further added that with proper funding, some of the local innovation like the Solar lighting project in Sierra Leone would be able to be rolled out nationally and have a wider impact.

4.9 Presentation of the Communique-by Dr Ernest Acheampong



Dr Acheampong presented the conference communique which highlighted all the deliberations and presentations given by the delegates during the two-day events. Some of the key highlights presented include: The realization that there is need for increased capacity building in STI for it to continuously contribute to sustainable development in Africa and for the achievement of SDGs. Collaboration and partnerships need to be encouraged to enable STI development in Africa and the private sector needs to take a leading role in STI sector development whereas the government should provide the enabling environment for that to thrive. The details of the communique are provided in Annex II for your reference.

5. ATPS @25-SILVER JUBILEE

5.1 Presentation ATPS@25: The Journey So Far- Dr. Nicholas Ozor-Executive Director

Dr. Ozor provided a synopsis of how the ATPS has grown over the years since its inception and detailed all the achievements realized so far. He thanked the founding donors the IDRC and the former Executive Directors, Board members and staff who sacrificed immensely in developing the organization across Africa. Now its presence is being felt all over Africa as well as some other countries outside Africa. Its network has grown and continues to grow across the world. He thanked the National Chapter coordinators who have continuously supported the work of the ATPS in their respective countries. Consequently, Dr. Ozor thanked all the donors who have been supporting the organization over the years and noted that without them, ATPS would not be at the level it is now. He reserved special thanks to KFCB, AFREXIMBANK, AERC, RMRDC, SEI-Africa, AAS, the Governments of Kenya and Nigeria for supporting the event. Finally, he thanked the Keynote Speaker Dr. Mahama and other presenters for finding time to join the ATPS community for the event.

5.2 Remarks from Key Stakeholders

Prof. Agnes Mwang'ombe, Dr. Stephen Karimi and H.E Ambassador Sheidu Momoh-Nigeria Ambassador to Kenya, congratulated the ATPS for achieving this fate and wished all the ATPS family a prosperous Silver Jubilee. They all reiterated that strong partnerships and cooperation amongst governments and organizations is key to sustainable development in Africa. The chief guest, Dr. Ruggutt representing the cabinet secretary for ICT, Kenya, Joe Mucheru congratulated the ATPS fraternity and hailed them for their contribution to STI in Africa. He pledged to continue working closely with ATPS.



Plate 1: The Unveiling of the Silver Jubilee Plaque during the ATPS silver Jubilee celebrations

5.3 ATPS Awards Ceremony

Various individuals and institutions were recognized and awarded during the event before ushering in song and dance. Among those awarded are the former Executive Directors and founders, present and former Board members and former outstanding staff members. Among the institutions awarded are AFREXIMBANK, AERC, AAS, SEI-Africa, KFCB and RMRDC. The delegates led by the chief guests were also awarded certifications of participation. The details of the institutions and individuals awarded during the event are provided in *Annex III*.



Plate 2: The ATPS National Chapter Coordinator, Nigeria, Prof. Michael Madukwe (second left) receiving his award from Dr. Rugutt. On looking is Dr. Mahama (left), Prof. Kiamba (second from right) and Dr. Ozor (right)

6. CONCLUSION AND RECOMMENDATIONS

The ATPS convened a delegation of ministers, academia, private sector and civil society to deliberate on the theme “*Using Science, Technology and Innovation (STI) as a means for achieving the Sustainable Development Goals (SDGs) in Africa*”. Delegates were drawn from over 40 countries in Africa and beyond. It was recognized that there is a strong recognition of the role of STI in Africa’s development trajectory at the continental, regional, national and institutional levels. This is evident in the multiple declarations right from 1960 through the 80s until now. There is a strong desire on the continent to build a modern economy that is driven by STI as evidenced in the development of continental STI strategy, STISA 2024, Regional and National STI policies among others. There need for Africa to be at the cutting edge of technology and innovation to leapfrog Africa’s industrialization, stability, and technological revolution. It was also noted that STI is essential in the provision of vital data and information that will drive policy and decision-making in Africa. To solve critical problems in our society today, capacity will be critical for STI development to be able to explore opportunities in technological advancements for societal change and decision-making. The role that ATPS play in providing platforms for collaborative and innovative policy research that support African governments and STI institutions to build necessary knowledge conditions and infrastructures, policies and incentives, and capabilities for STI knowledge generation, brokerage, circulation, and socialization to ensure effective valorisation and commercialization of scientific and indigenous knowledge into new technologies and innovations for sustainable development on the continent was lauded and is the key for unlocking Africa’s STI potential for sustainable development. All speakers congratulated ATPS as it marked its Silver Jubilee and pledged to support its activities going forward in their various capacities in the different institutions they represented.

It was recommended that:

- i) There be continuous capacity development of individuals and institutions toward the generation of STI knowledge that is tailored to the development needs of Africans is critical to achieving our goals and aspirations.
- ii) The journey towards the mastery of STI needs to be driven by the private sector and not by the government. However, the governments in Africa must create the enabling environments for the private sector actors to thrive.
- iii) There is need to not only address capacity, funding or several other challenges but to also renew the mindset of the entire citizenry (Social Transformation) to STI independence for Africa’s industrialisation and socio-economic transformation to succeed.
- iv) Collaboration and partnerships need to be encouraged to enable STI development in Africa. A partnership can be brokered among stakeholders in the public and private sectors within and outside Africa.
- v) A holistic National Innovation System (NIS) approach to harnessing STI capacity for addressing the development challenges is necessary for Africa’s socio-economic transformation is required.

ANNEXES

Annex I: Programme

DAY 1- Wednesday 30 October, 2019			
Time	Topic/Presentation	Facilitators	
8:00- 8:30 am	Registration	-Felix Musila	
		-Damaris Kavesa	
Opening Session-Official Opening Ceremony Moderators: Dr. Ernest Acheampong, INBAR Dr. Maurice Bolo, Scinnovent Centre Rapporteurs: Alfred Nyambane and Damaris Kaseva			
Time	Topic/Presentation	Presenters	Session Chair
8:30- 8:35 am	Welcoming Remarks from ATPS Kenya Chapter	Dr. Stephen Karimi , Board Member ATPS Kenya Chapter and Director Accreditation and Quality Assurance, NACOSTI.	Prof. Joseph Obua- Former ATPS National Chapter Coordinator, Uganda; College of Agricultural and Environmental Sciences Makerere University, Uganda
8:35- 8:40 am	Welcoming Remarks from the ATPS Secretariat	Dr. Nicholas Ozor , ATPS Executive Director.	
8:40- 8:45 am	Welcoming Remarks- the ATPS Board of Directors	Prof. Crispus Kiamba , Ag. Chair ATPS Board of Directors.	
8:45- 9:15 am	Opening Remarks from our Partners	1. Prof. Benedict O. Oramah , President AFREXIMBANK 2. Prof. Njuguna Ndung’u , Executive Director AERC. 3. Dr. Ezekiel Mutua , MBS, Chief Executive Officer, KFCB 4. Dr. Philip Osano , Ag. Centre Director, SEI 5. Dr. H. Doko Ibrahim , DG/CEO RMRDC 6. Prof. Nelson Torto , Executive Director AAS.	
9:15- 10:00 am	Opening Keynote Address on “Using Science, Technology and Innovation (STI) as a means for achieving the Sustainable Development Goals (SDGs) in Africa”	Dr. Ouedraogo Mahama , Director Human Resource Science and Technology, AUC	
10:00- 10:15 am	Official Opening by the Chief Guest of Honour	Prof. George Magoha , CS Ministry of Education, Kenya	
10:15- 10:25 am	Group Photo		
10:25- 10:50 am	Health/Coffee/Tea Break		
10:50- 11:15 am	Panel Discussion on the Opening Keynote Paper	- Prof. Osita Ogbu , FNAE, OON; University of Nigeria and Managing Director, ADSI. - Prof. Michael C. Madukwe , ATPS National Chapter Coordinator Nigeria and University of Nigeria Nsukka, Nigeria.	Prof. Joseph Obua- Former ATPS National Chapter Coordinator, Uganda; College of Agricultural and Environmental Sciences Makerere University, Uganda

		-Prof. Francis Aduol , Vice Chancellor, Technical University of Kenya. -Prof. Emmanuel Nnadozie , Executive Secretary, African Capacity Building Foundation (ACBF). -Prof. Sylvester Ndeso -Lecturer, Epidemiology & Public Health Faculty of Health Sciences University of Buea, Cameroon. -Prof. Crispus Kiamba CBS, MBS, Ag. Chair ATPS Board of Directors; School of Built Environment, UoN. -Dr. Jemimah Onsare , Ag. CEO National Research Fund-Kenya.	
11:15-11:25 am	Facilitated Discussion	All Delegates	
Plenary Session 1-Keynote Presentations			
Time	Topic/Presentation	Presenters	Session Chair
11:25-11:55 am	Science, technology and innovation priorities for Africa's development	Dr. George Essegbey , Chief Research Scientist, Science and Technology Policy Research Institute (STEPRI)/CSIR, Ghana.	Prof. Nelson Torto , Executive Director AAS.
11:55-12:05 pm	Case interventions	-Dr. Nadia Hassan , ATPS National Chapter Coordinator, Sudan. Economic Studies Department Industrial Research & Consultancy Centre (IRCC) Sudan. -Mr. Benson Zwizwai , ATPS National Chapter Coordinator, Zimbabwe. Chairman, Economics Department University of Zimbabwe.	
12:05-12:15 pm	Facilitated Discussion	All Delegates	
12:15-12:40 pm	Funding science, technology and innovation priorities for Africa's development	Dr. Akanimo Odon , CEO, Environfly Consulting, and Lancaster University, UK.	
12:40-12:50 pm	Case Interventions	-Mr. Wondwossen Belete , ATPS National Chapter Coordinator, Ethiopia and Director of Intellectual Property Protection and Technology Transfer, EIPO. -Prof. Dr. Saïd Boujraf ATPS National Chapter Coordinator Morocco and Director of the Clinical Neuroscience Laboratory, University of Fez Morocco.	
12:50- 1:00 pm	Facilitated Discussion	All Delegates	

1:00- 2:00 pm	Lunch Break		
Plenary Session 2-Keynote Presentations Rapporteur: Mr Marsden Momanyi and Damaris Kaseva			
Time	Topic/Presentation	Presenters	Session Chair
2:00- 2:25 pm	Improving Intra-Africa Trade using science, technology and innovation	Prof. Benedict Oramah, President, AFREXIMBANK.	Prof. Njuguna Ndung’u, Executive Director, AERC.
2:25- 2:35 pm	Case Interventions	-Prof. Arsène Kouadio, ATPS National Coordinator, Cote d’Ivoire and University of Abidjan-Cocody, Cote d’Ivoire. -Ms. Manal Moustafa Samra, ATPS National Chapter Coordinator, Egypt.	
2:35-2:45 pm	Facilitated Discussion	All Delegates	
2:45- 3:10 pm	The Fourth Industrial Revolution and Africa’s Readiness	Ms Ann Therese Ndong-Jatta, Director UNESCO Regional Office for Eastern Africa.	
3:10-3:20 pm	Case Interventions	-Eng. Lourino Alberto Chemane, ATPS National Chapter Coordinator, Mozambique and ICT and Planning Advisor, Executive Secretariat, ICT Policy Commission, Mozambique. -Dr. Wollor Emmanuel Topor, ATPS National Coordinator, Liberia and College of Science and Technology, University of Liberia.	
3:20-3:30 pm	Facilitated Discussion	All Delegates	
3:30- 3:45 pm	Health/Coffee/Tea Break		
3:45- 4:10 pm	Gender and inclusivity in science, technology and innovation	Dr. Kathryn Toure, Regional Director Sub-Saharan Africa International Development Research Centre (IDRC)	Prof. Agnes Mwang’ombe EBS, University of Nairobi, Kenya
4:10- 4:20 pm	Case Interventions	-Mrs. Martha Ada Ugwu ATPS National Chapter Coordinator, United Kingdom -Prof. Musa Dube, Faculty of Agriculture Luyengo Campus University of Eswatini.	
4:05- 4:15 pm	Facilitated Discussion	All Delegates	
End of Day 1			

DAY 2- Thursday 31 October, 2019			
Time	Topic/Presentation	Facilitators	
9:00- 9:20am	Re-cap of Day 1	Dr. Ernest Acheampong	

Parallel Sessions 9:20- 12:50 pm				
Sub theme 1: Science, technology and innovation priorities for Africa's development	Sub theme 2: The Fourth Industrial Revolution and Africa's Readiness	Sub theme 3: Improving Africa's Intra-Africa Trade using science, technology and innovation	Sub theme 4: Funding science, technology and innovation priorities for Africa's development	Sub theme 5: Gender and inclusivity in science, technology and innovation
Providing Off-Grid Solar Light To Rural Areas In Sierra Leone By: K. G. Mansaray and T. Morlai	Leveraging 4 th Industrial Revolution (4IR) to Drive Africa's Transformation Dr Julius Gatune	The potential for STI in assessing the environmental implications of the African Continental Free Trade Area (AfCTA) Dr Philip Osano	Funding science, technology and innovation priorities for Africa's development Dr Akanimo Odon	Gender Gap Analysis of Adoption of Technology and Innovation (TI) among Rural Farmers in Nigeria: A Case of Gender Mainstreaming and Development Policy in Africa Adama Alami, and Omeje Emmanuel E.
Nagging Food Insecurity In Nigeria: The Missing Links A.N. Eneh and Eneh Onyenekenwa		Trajectories of knowledge and innovation systems among cassava cooperative farmers towards improving livelihoods and industrial development in Southern Nigeria Prof. Edwards Adeseye Alademerin	Climate Change and Sustainable Development Focus on Sahel and Sahara Region of Africa: Sustainability Analysis Research Study for Pan African Agency on Great Green Wall (PAGGW) Dr Chidi Magnus Onuoha	Agroforestry - Coping Mechanism for Food Insecurity and Unemployment In Nigeria: A Case of Rural Women / Youths In Imo State, Nigeria. Ogueri Emma Ifeanyi and Mgbada, Justina
Sustainable Agricultural Innovations And Tools: The Solution to Africa's Food and Environmental Challenges Kum Christian & Prof Sylvester Ndeso				
Innovation, Inclusion and SDGS in Sub-Saharan Africa: Challenges and Opportunities Nepeti Nicanor				
Field Extension Agents' Utilization of Mobile Applications for Agricultural Extension Service Delivery in Ebonyi State Agricultural Development Programme Ann N. EZEH and Anayochukwu V. EZE		Xenophobia: Retarding Africa's Intra-African Trade, Science-Technology-Innovation (STI) Transfer and agricultural Development Omeje, Emmanuel Ejiofor		Early Childhood Malnutrition and Labour Productivity Growth in West Africa Fredrick Onyebuchi Asogwa, Okeke Donatus Ifeanyi, Joseph Amuka and Nathaniel Urama
Healthcare Services Satisfaction in the Prison: A Cross-Sectional Survey and Comparative Analysis of Inmates' Perspectives in an African Country Ochonma, Ogonnia G				Assessment of Factors Militating against Rural Women's Participation in Modern Innovative Palm Oil Processing in South East Nigeria. Ezeibe Adaku Bridget Chidi

Proposed Plan for Acceleration of Medical Training through Enhanced Enrolment, Out-Turns in Reducing Shortage of Physicians in Nigeria Christopher Enyioma Alozie				Harnessing the Power of Technology: The State of Women in the 21st Century Umulumgbe Odo Performance Dr Gloria Nwandu Ozor
Could Sustainable Agricultural Innovations in Africa be the Solution to Soil Health and Climate Change for Enhanced Food Production? Kum Christian Tegha and Sylvester Ndeso Atanga				Gender-Based Analysis on ICT Accessibility and Utilization for Enhanced Performance among Undergraduate Students in Ogun State, Nigeria Omobolanle Marcus Nosiru and Oshionebo, Esther Emike
Achievements and Challenges from African Technology Policy Studies Network by Eswatini National Chapter: A Success Story Musa M. A. Dube & Absalom M. Manyatsi				
From 'Communicating' to 'Engagement': Sustainable Agriculture and Afro- Relationality Framework for Climate Change Communication Dominic Ayegba Okoliko and Prof. Martin de Wit				
Effects of Land Use Change on Soil Quality in Mai Mahiu Ecosystem in Naivasha Sub-County, Kenya Basweti Caleb, Manohar, S. and Otor, S.				
Impact of Climate Change on Adaptive Strategies that lead to Sustainable Livelihoods: Resource Base Carrying Capacity, Climate Change Variability, and Population Growth: A Case Study of four Communities in Wonago Woreda, Ethiopia Costantinos Berhutesfa Costantinos				

A Case of 'Tingadalire Organic Food Products' Using Science, Technology And Innovations in Agricultural Value Chains and Waste Management Systems in Malawi Tennyson Magombo				
Technology, Innovation Behaviour and Rice Production Efficiency Differentials in Northeast, Nigeria: Policy Implications for Africa's Technological Development Omeje Emmanuel Ejiofor and Arene John Chukwuemeka				
The Untapped Potential of Local Innovations for Achieving Sustainable Development Goals in Africa: The Experience of Ethiopia Shirega Minuye Meskay				
Status of the Adoption of Modern Biotechnology for Agriculture in Africa A.M. Dlamini, M.A. Dube and B.Z. Nkhabindze				
Socio-economic survey of forest foods in afijio local government area of oyo state, Nigeria Oluwole Sikiru BANJO*, Akinyode Timothy OLAWUMI				
Design, Construction and Determination of Thermal Efficiency of a Model Solar Power Irrigation System Ayanda J.D*, Ogunsanwo F.O and Falayi E.O				
Prospects of Farmer Managed Natural Regeneration (FMNR) and Its Impact on Forest Condition in Sinyala, Lilongwe, Malawi Judith Kamoto, Charles Wella and Jabulani Nyengere				

NERICA Technological Innovation for Improved Rice Economy in Nigeria Omobolanle Marcus Nosiru & Mohammed Abdul Yekeen Rahji				
Speedy Development of Africa Using Smart Energy Options and Air Pollution Reduction Kingsley Ukoba				

Silver Jubilee Celebrations Moderator: Dr. Ernest Acheampong, INBAR Dr. Maurice Bolo, Scinnovent Centre		
2:00- 2:30 pm	ATPS@25: The journey so far	-Dr. Nicholas Ozor, Executive Director, ATPS
2:30- 3:00 pm	Remarks by Key ATPS Stakeholders	-Prof. Agnes Mwang'ombe -Dr. Stephen Karimi -H.E. Ambassador Sheidu Momoh -Prof. Crispus Kiamba
3:00- 3:15 pm	Remarks and Launch of ATPS@25 (Silver Jubilee) by the Chief Guest of Honour	Hon. Joe Mucheru, E.G.H. Cabinet Secretary, Information and Communication Technology (ICT), Kenya.
3:15- 3:30 pm	Award of Prizes and Certificates	
	-Institutional Awards -Individual Awards	
3:30- 3:50 pm	Closing Remarks and Way Forward	-Dr. Nicholas Ozor, Executive Director, ATPS
3:50- 4:00 pm	Vote of thanks	-Prof. Crispus Kiamba, Ag. Chair ATPS Board of Directors
4:00- 4:30 pm	Coffee Break	
4:30- 5:30 pm	Annual General Meeting	ATPS Members Only
	Celebrations-Music and Dance	
6:00- 8:00 pm	Cocktail and Networking	
End of ATPS Annual Forum, Conference and Silver Jubilee Celebrations: Delegates to leave at their own pleasure		

Annex II: Communiqué

Preamble:

The African Technology Policy Studies Network (ATPS) convened a delegation of ministers, academia, private sector and civil society to deliberate on the theme “Using Science, Technology and Innovation (STI) as a means for achieving the Sustainable Development Goals (SDGs) in Africa”. Delegates were drawn from over 40 countries in Africa and beyond.

The delegates to the conference which was held at the Crowne Plaza Hotel, Nairobi recognized that:

- At the continental, regional, national and institutional levels, there is a strong recognition of the role of STI in Africa’s development trajectory. This is evident in the multiple declarations right from 1960 through the 80s until now
- There is a strong desire on the continent to build a modern economy that is driven by STI as evidenced in the development of continental STI strategy, STISA 2024, Regional and National STI policies among others
- The integral and instrumental role of STI in the achievement of the Sustainable Development Goals (SDGs)
- The need for Africa to be at the cutting edge of technology and innovation to leapfrog Africa’s industrialization, stability, and technological revolution
- STI is essential in the provision of vital data and information that will drive policy and decision-making in Africa
- We have witnessed some incremental changes in development and application of STI in Africa
- To solve critical problems in our society today, capacity will be critical for STI development to be able to explore opportunities in technological advancements for societal change and decision-making
- There is need to figure out how STI will have a real impact on our society, in terms of:
 - Transforming our financial systems to improve transparency and accountability
 - Positively influencing the real economy to improve societal welfare
 - Innovative ways of providing financial sustainability for STI in Africa
 - The double-edge character of technology and innovation in modern society
- The role that ATPS play in providing platforms for collaborative and innovative policy research that support African governments and STI institutions to build necessary knowledge conditions and infrastructures, policies and incentives, and capabilities for STI knowledge generation, brokerage, circulation, and socialization to ensure effective valorisation and commercialization of scientific and indigenous knowledge into new technologies and innovations for sustainable development on the continent is key.

The delegates further observed that:

- Science, Technology and Innovation remain the fundamental driver and enabler to achieve the aspirations and goals of the African Union's Agenda 2063.
- Africa has made significant effort towards developing capacity to deliver STI driven development agenda. However, a change of mindset is key to transformation. With the relative number of human resources and facilities that are available, Africa can achieve far more if we set our minds to work and achieve greater heights in STI.
- Through a transdisciplinary approach, STI knowledge must target the specific problems and needs of the society. A platform for experience sharing, learning, diffusion of research and technology transfer is required
- Investment in research and development (R&D) is critical but also in innovation which normally occurs outside the realms of R&D
- It is time for African policymakers, researchers, and practitioners to decolonize our minds to work within the confines of our limitations, to turn problems into strategic resources and be able to generate financial resources to drive STI development
- Africa's development challenges are daunting – food and nutrition, job creation, healthcare and wellbeing, industrialization and environmental sustainability – but these challenges must be seen as opportunities that can motivate the continent to develop and apply STI.
- The transition towards technology savvy/ digital economy is already happening and this will require vigorous STI policy research and advocacy
- Investment in regional infrastructure and STI is necessary to bridge the intra-Africa trade gaps among African countries
- We envision a strong commitment of our development partners such as African Export and Import Bank (AFREXIMBANK), International Development Research Center (IDRC), African Development Bank (AFDB) and SWISS Development Cooperation to support the ATPS in driving the STI development agenda in Africa.

The delegates therefore resolved that:

- The continuous development of the capacity of individuals and institutions toward the generation of STI knowledge that is tailored to the development needs of Africans is critical to achieving our goals and aspirations. The STI priorities and the emerging technologies require the development of capacity at individual, institutional and systemic levels.
- The journey towards the mastery of STI will be driven by the private sector and not by government. However, the governments in Africa must create the enabling environments for the private sector actors to thrive.
- The road to STI independence for Africa's industrialisation and socio-economic transformation will succeed not only by addressing capacity, funding or the several other challenges, but by the renewal of the mindset of the entire citizenry (Social Transformation).
- Collaboration and partnerships are key for STI development in Africa. Partnership can be brokered among stakeholders in the public and private sectors within and

outside Africa.

- A holistic National Innovation System (NIS) approach to harnessing STI capacity for addressing the development challenges is necessary for Africa's socio-economic transformation is required.

Implementing these policy recommendations is essential to promoting STI independence which is imperative for achieving the SDGs. ATPS should be supported by the development partners to implement these recommendations.

Appreciation:

Delegates finally expressed appreciation to the development partners who have been supporting the good works of ATPS as the premier STI organization on the continent and encouraged them to do more as well as welcomed new partners to support the works of ATPS.

Annex III: ATPS Silver Jubilee Awards Recipients

A. Institutional Awards

S/n	Plaques	Certificates of Recognition
	<i>ATPS Champions in promoting Science, Technology and Innovation in Africa</i>	
1.	International Development Research Centre (IDRC)	African Academy of Sciences (AAS)
2.	Raw Materials Research and Development Council (RMRDC)	University of Nigeria, Nsukka (UNN)
3.	Kenya Film Classification Board (KFCB)	Technical University of Kenya (TUK)
4.	African Economic Research Consortium (AERC)	Nigeria High Commission, Kenya
5.	Africa Export and Import Bank (AFREXIMBANK)	UNESCO Regional Office, Nairobi, Kenya
6.	Stockholm Environment Institute – Africa Centre	National Commission for Science, Technology and Innovation (NACOSTI), Kenya
7.		The African Capacity Building Foundation (ACBF)
8.		National Research Fund (NRF)

B. Individual Awards

S/n	Plaques/Certificates of Recognition
	<i>ATPS Champions in promoting Science, Technology and Innovation in Africa</i>
1.	Osita Ogbu, Ph.D., FNAE, OON
2.	Prof. Kevin Chika Urama
3.	Prof. Turner Isoun
4.	Prof. Crispus Makau Kiamba, CBS, MBS
5.	Prof. Azikiwe Peter ONWUALU, FAS
6.	Prof. Dr. Chinwe Ifejika Speranza
7.	Dr. George Owusu Essegbey
8.	Dr. Akanimo Odon
9.	Dr. El Tayeb Mustafa
10.	Prof. Francis Aduol
11.	Prof. Chris Garforth
12.	Prof. Charles Igwe
13.	Prof. Joseph Obua
14.	Prof. Agnes Wakesho Mwang'ombe, EBS
15.	Dr Catherine Kyobutungi
16.	Dr. Paul Orengo

17.	Prof. Njuguna Ndung'u
18.	Dr. Sheila Ochugboju
19.	Dr Ernest Nti Acheampong
20.	Dr. Stephen Karimi
21.	Dr. Maurice Bolo
22.	Prof. Francis Yamba
23.	Ms. Carol Thuku
24.	Dr. Ezekiel Mutua, MBS
25.	Mr. Richard Murimi Muriuki
26.	Mrs. Christine Hayanga
27.	Prof. Dr. Roch L. Mongbo
28.	Prof. Dr. Arsène Kouadio
29.	Ms. Manal Moustafa Samra
30.	Dr. Wollor Emmanuel Topor
31.	Dr. Benoit Kabore
32.	Mr. Wondwossen Belete
33.	Dr. Kingdom M. Kwapata
34.	Prof. Sylvester Ndeso Atanga
35.	Dr. Fred Amu-Mensah
36.	Dr. Sidiki Gabriel Dembele
37.	Prof. Dr. Saïd Boujraf
38.	Dr. Kelleh Gbawuru Mansaray
39.	Mrs. Martha Ada Ugwu
40.	Prof. Papa Alioune Sarr Ndiaye
41.	Engr. Dr. John Okuonzi
42.	Eng. Lourino Alberto Chemane
43.	Prof. Mark Swilling
44.	Dr. Anthony C. Ikeme
45.	Prof. Michael C. Madukwe
46.	Mrs. Nadia Hassan Sidahmed
47.	Prof. Musa Majahencwala Aaron Dube
48.	Prof. Femi Olokesusi
49.	Mr. Benson Zwizwai
50.	Dr. Marie-Christine Gasingirwa
51.	Dr. Amos Nungu
52.	Dr. Sunny Akpoyibo
53.	Dr. Hamdy Ahmed

54.	Dr. Jemimah Onsare
55.	Mr. Marsden Momanyi
56.	Prof. Judi Wakhungu
57.	Prof. Samuel M. Wangwe
58.	Prof. Nora Olembo
59.	Mr. Chuma Ikenze
60.	Prof. Oyebanji Oyelaran-Oyeyinka
61.	Prof. Shaukat Abdulrazak
62.	Prof. Emmanuel Nnadozie
	List of candidates to receive Certificates of Participation in the Conference
63.	Dr. Gloria Nwandu Ozor
64.	Dr. Chidi Magnus Onuoha
65.	Prof. Christopher Enyioma ALOZIE
66.	Dr. Jacob Ayanda
67.	Mr. Tennyson Magombo
68.	Prof. Costantinos Berhutesfa Costantinos
69.	Dr. Esther Oshienebo
70.	Prof. Omeje Emmanuel Ejifor
71.	Dr. Onyenekwa Eneh
72.	Prof. Abednego Mfanufikile Dlamini
73.	Prof. Ogbonnia Ochonma
74.	Dominic Ayegba Okoliko
75.	Dr Fredrick Onyebuchi Asogwa
76.	Dr Judith Kamoto
77.	Dr Onuoha Chidi Magnus
78.	Dr. Philip Osano
79.	Mr. Caleb Basweti
80.	Prof. Musa Majahencwala Aaron Dube
81.	Dr. Akanimo Odon
82.	Dr. Ouedraogo Mahama
83.	Prof. Edwards Aldemerin Adeseye
84.	Dr. Julius Gatune

Annex IV: List of Delegates



PARTICIPANTS LIST FOR 2019 ANNUAL FORUM, CONFERENCE AND SILVER JUBILEE CELEBRATIONS

30-31 OCTOBER, CROWNE PLAZA

SNO.	NAME	COUNTRY/ INSTITUTION	EMAIL & PHONE NO.	SIGNATURE
1.	MR. HAILE WONDWOSSEN BELETE	Ethiopia +251-911886109	Wondwossenbelete@gmail.com	[Signature]
2.	DR. AMU-MENSAH FREDERICK K	Ghana +233 24 474 8697	obeyie@gmail.com	[Signature]
3.	DR. MANSARAY KELLEH GBWURU	Sierra Leone	+232 861 271 271	[Signature]
4.	PROF. MADUKWE MICHAEL CHUKWUNEKE	Nigeria +2348037016968	madukwe.michael@gmail.com	[Signature]
5.	ENG. CHEMANE LOURINO ALBERTO	Mozambique +258823110700	Lourd.chemane@gmail.com	[Signature]
6.	MS. SERENJE NANCY CHAMA	Zambia		[Signature]
7.	PROF. DR. KOUADIO ARSENE KONAN	Cote d'Ivoire	arsene.kouadio@gmail.com	[Signature]
8.	PROF. DR. BOUJRAF SAID	Morocco	+212 642 111103	[Signature]
9.	DR. TOPOR WOLLOR	Liberia +231-886875502	toporwollor@gmail.com	[Signature]
10.	PROF. DR. MONGBO ROCH L	Benin	+229 92374737	[Signature]
11.	PROF. DUBE MUSA MAJAHENCWALA AARON	Eswatini +268-7606-3744	madube@unswin.sz	[Signature]
12.	MRS. SAMRA MANAL MOUSTAFA	Egypt	ms.samm@gmail.com	[Signature]
13.	HASSANEIN MAGDY FAHMY I	Egypt magdy_fahmy@qu.edu.eg	magdy_fahmy@qu.edu.eg	[Signature]
14.	DR. ACHEAMPONG ERNEST NTI	Ghana		[Signature]
15.	DR. ODON AKANIMO PETER	UK +474497081119	a.odon@lancaster.ac.uk	[Signature]
16.	MRS. NADIA HASSAN SIDAHMED HASSAN	Sudan		[Signature]
17.	PROF. NDESO ATANGA SYLVESTER	Cameroon +237 653774599	silawrence2011@gmail.com	[Signature]
18.	DR. ESSEGBEY GEORGE OWUSU	Ghana CSIR-STEPRI	gessegbey@hotmail.com	[Signature]
19.	DR. VINCENT SIMON BANDA	Malawi 0192188989	bandasimon@gmail.com	[Signature]
20.	DR. MAHAMA OUEDRAOGO	Ethiopia-AUC		[Signature]



SNO.	NAME	COUNTRY/ INSTITUTION	EMAIL & PHONE NO.	SIGNATURE
21.	MR. ZWIZWAI BENSON	Zimbabwe	zwizwai@zimbabwe.co.zw 263772696902	<i>Zwizwai</i>
22.	PROF. DR. IFEJKA SPERANZA CHINWE LEOMA	Nigeria		<i>Ifejika</i>
23.	DR. NWODOH MARTHA NGOZIKA ADA	UK	07985496289	<i>Nwodo</i>
24.	DR. ONUOHA MAGNUS CHIDI	Nigeria	08033167245	<i>Chidi</i>
25.	OKAFOR UZOCHUKWU GODSWAY	Namibia	26481122311	<i>Okafor</i>
26.	PROF. EDWARDS ALDEMERIN	Eswatini	+26876682818	<i>Edwards</i>
27.	PROF. ALOZIE CHRISTOPHER ENYIOMA	Nigeria	01111111111	<i>Enyioma</i>
28.	DR. ABEDNEGO MFANUFIKILE DLAMINI	Eswatini	+26876034608	<i>Adlamini</i>
29.	DR. SHIREGA MINUYE	Ethiopia		
30.	DR. EMMA OGUERI	Nigeria		
31.	DR. JULIUS GATUNE	Kenya	0714328240	<i>Gatune</i>
32.	DR. MOSES RUGUTT	NACOSTI- Kenya		
33.	MS. MARJORIE OKORA	ACBF	m.okora@acbf-pact.org	<i>Okora</i>
34.	DR. EMMANUEL NNADOZIE	ACBF	nnadozie@acbf-pact.org	<i>NNadozie</i>
35.	DR. OGBONNIA OCHONMA	Nigeria		
36.	MR. DOMINIC AYEGBA OKOLIKO	South Africa	07717045454	<i>Okoloko</i>
37.	PROF. FREDRICK ONYEBUCHI ASOGWA	Nigeria		
38.	DR. JUDITH KAMOTO	Malawi		
39.	DR. PHILIP OSANO	SEI-Africa	072170708	<i>Osano</i>
40.	MR. CALEB BASWETI	Kenya	0922369139	<i>Basweti</i>
41.	DR. STEPHEN KARIMI	NACOSTI-Kenya		
42.	DR. ROBERT OCHOLA	AFREXIMBANK	0700608243	<i>Ochola</i>
43.	DR. CHRISTIANE ABU LEHAF	AFREXIMBANK	caboutekaf@afreximbank.com	<i>Lehaf</i>

+20128887735 *Alt*



SNO.	NAME	COUNTRY/ INSTITUTION	EMAIL & PHONE NO.	SIGNATURE
44.	DR. MAURICE BOLO	Scinnovent		
45.	MS. CAROL THUKU	Ministry of ICT- Kenya		
46.	DR. EZEKIEL MUTUA, MBS	KFCB-Kenya		<i>Dr. E. Mutua</i>
47.	AMB. SHEIDU MOMOH	Nigerian High Commissioner		
48.	PROF. GEORGE MAGOHA	Cabinet Secretary, Education-Kenya		
49.	HON. JOE MUCHERU	Cabinet Secretary, ICT-Kenya		
50.	PROF. FRANCIS ADUOL	TUK-Kenya		
51.	DR. KATHRYN TOURE	IDRC		
52.	PROF. JOSEPH OBUA	Uganda	+256 772 444 472 johua09@gmail.com	<i>Prof. Joseph Obuga</i>
53.	PROF. AGNES WAKESHO MWANG'OMBE	UON-Kenya	wakesho123@gmail.com	<i>Prof. Agnes Wakesho Mwang'ombe</i>
54.	DR. H. DOKO IBRAHIM	RMRDC		
55.	PROF. NELSON TORTO / Dr. A. NEBA	AAS	a.neba@arc.ac.ke	<i>Prof. Nelson Torto</i>
56.	DR. PAUL ORENGO	Kenya	+254 722 320 259 perengoh@amcow-online.org	<i>Dr. Paul Orengo</i>
57.	MS. ANN THERESE NDONG-JATTA	UNESCO		
58.	PROF. NJUGUNA NDUNG'U	AERC		
59.	PROF. CRISPUS MAKAU KIAMBA, CBS, MBS	UON-Kenya		
60.	MR. RICHARD MURIMI MURIUKI	Kenya	mr.murimimuriuki@gmail.com	<i>Mr. Richard Murimi Muriuki</i>
61.	MRS. CHRISTINE HAYANGA	Kenya	info@hayangethinkers.co.ke	<i>Mrs. Christine Hayanga</i>
62.	DR. SUNNY AKPOYIBO	Nigeria	0721830016	
63.	DR. JEMIMAH ONSARE	NRF-Kenya	0736092188	<i>Dr. Jemimah Onsare</i>
64.	MR. MARSDEN MOMANYI	WWF	0719784872	<i>Mr. Marsden Momanyi</i>
65.	PROF. JUDI WAKHUNGU	Kenya		
66.	PROF. NORA OLEMO	Kenya		



SNO.	NAME	COUNTRY/ INSTITUTION	EMAIL & PHONE NO.	SIGNATURE
67.	DR. GLORIA NWANDU OZOR	TUK-Kenya	glosung25@gmail.com	[Signature]
68.	MR. TENNYSON MAGOMBO	Malawi		
69.	PROF. COSTANTINOS BERHUTESFA COSTANTINOS	Ethiopia		
70.	PROF. OMEJE EMMANUEL EJIFOR	Nigeria		
71.	DR. ONYENKWA ENEH	Nigeria		
72.	DR. ESTHER OSHIONEBO	Nigeria +234 813 926 1874	eshionebo@unilag.edu.ng	[Signature]
73.	DR. NICHOLAS OZOR	ATPS-Kenya		
74.	FELIX MUSILA	ATPS-Kenya	Fmusila@atps.net.org	[Signature]
75.	ALFRED NYAMBANE	ATPS-Kenya	anyambane@atps.net.org	[Signature]
76.	RACHEL NZAMBI	ATPS-Kenya	malindi@rachelnzambi.com	[Signature]
77.	DAMARIS KASEVA	ATPS-Kenya	dmariseva@gmail.com	[Signature]
78.	PHILIP MUSEMBI	ATPS-Kenya	pmusembi@atps.net.org	[Signature]
79.	MATHEW IMULIA	ATPS-Kenya	mimulia@atps.net.org	[Signature]
80.	HELLEN OPILE	HAYANGA NW-KENYA	hienopile@gmail.com 0726407562	[Signature]
81.	SAMUEL PARTHY	UNESCO-KENYA	Spartey@unesco.org 0726970772	[Signature]
82.	Cynthia Muriu	UNESCO-Kenya	cynthia.muriu@unesco.org 0702502419	[Signature]
83.	DR. CHARLES OWING	AERL	0721353777	[Signature]
84.	DR. S. KAMINI	KENYA-NACOSTI	karimistev@gmail.com	[Signature]
85.	MR. Japheth Maragari	KENYA-CDA	info@japhethmaragari.com	[Signature]
86.	MR. CELESTINE UCHENNA	KENYA	uichen@uichen.com	[Signature]
87.	MILKED MUGAMBI	NACOSTI	mugambi@nacosti.org	[Signature]
88.	SILVER MBUCHA	AAS	silvermbucha@aasources.com	[Signature]



SNO.	NAME	COUNTRY/ INSTITUTION	EMAIL & PHONE NO.	SIGNATURE
89.	Nancy Mwangi	KENYA/ KFCB	0720785923	
90.	Dagallan C Kapsinti	KENYA/ KFCB	0721794350	
91.	Mariam Mwangi	KENYA/ KFCB	0720785923	
92.				
93.				
94.				
95.				
96.				
97.				
98.				
99.				
100.				