

I ABOUT THE CONFERENCE AND WORKSHOP

1.1 Introduction

The inescapable effects of climate change loom large in Africa. An Inter-governmental Panel on Climate Change (IPCC) report (2007) has shown that even though Africa accounts for less than 4 per cent of the world's greenhouse gas emissions, the region's diverse climates and ecological systems have already been altered by global warming and will undergo further damage. This reality calls for the need for African governments, partners and stakeholders to find innovative ways to cope with the effects of climate change and assist vulnerable communities to adapt to these imminent changes. The role of building Africa's science and technology (S&T) policy research and responsive innovation capacity to deal with the inevitable impacts of climate change on different sectors of Africa's economy cannot be gainsaid.

There is a significant role for S&T policy research in informing climate change adaptation and relevant policymaking processes in Africa. However, little efforts have been made to consolidate the existing information as well as generate S&T policy-relevant information in this area. The information and knowledge gaps can be addressed by generating a body of well targeted research and innovation capacity building activities. Engaging key stakeholders and relevant institutions in this process will ensure targeted research and policy interventions within the African continent and will also empower stakeholders to shape the policy research priorities, encourage ownership of the results and sustainable implementation of policy recommendations.

The African Technology Policy Studies Network (ATPS) in conjunction with the University of the Western Cape (UWC) and the University of Cape Town (UCT) held a three-day conference and workshop – from the 19 - 21 November 2007 in Johannesburg, South Africa – to discuss these issues under the theme *Science, Technology and Climate Change Adaptation in Africa*.

The conference and workshop brought together fifty eight delegates representing various stakeholder groups, institutions and professions, resource persons and development partners in various fields of expertise within and outside Africa. The delegates deliberated on how African countries can tap and adapt the existing science and technology (S&T) policies and innovation processes to respond to the effects of climate change in the

continent. The workshop was also expected to strengthen skills, learning capacities of actors and institutions in dealing with the effects of climate change in selected sectors: agriculture, health, biodiversity, water and environment.

The conference and workshop comprised of plenary presentation of papers. There were also participatory stakeholder dialogues to distill new knowledge garnered from the presentations and generate new ones. Moreover, the discussions raised research issues, needs and priorities requiring attention for improved understanding and capacity of innovation systems actors, science and technology (S&T) policy development, and impacts analyses. The plenary session synthesized and prioritized emerging research and policy issues and ways that ATPS (and other relevant organizations as well as development partners) can assist African countries to cope with the effects of climate change and assist vulnerable communities to adapt to these imminent climatic changes in Africa.

The diversity of stakeholders and professionals targeted was expected to bring different experiences and approaches that would result in richer and more inclusive innovation policy dialogue, more focused STI policy research programs and time-bound and achievable action plans.

1.1.1 Objectives of the Conference and Workshop

The objectives of conference and workshop were:

- i To appraise policy makers and other stakeholders on the effects of climate change in Africa and its impacts on agriculture, health, biodiversity, water and the environment;
- ii. To identify the institutional, knowledge and policy gaps that may constrain effective response to climate change and how the use of science, technology and innovation (STI) may be targeted to bridge these gaps in future;
- iii. To identify STI policy research, training, institutional capacity building needs that can inform how African countries adapt and respond to the effects of climate change;
- iv. To provide the opportunity for dialogue and knowledge sharing amongst African and non-African stakeholders and development partners, and
- v. Inform program priorities of the ATPS Phase VI Strategic Plan, 2008 – 2011 under the climate change theme.

1.1.2 Conference Themes

The conference and workshop focused on the following sub-themes:

b. Climate change, food security and African agriculture

Africa's agricultural sector accounts for more than 70% of its employment, an average of the 30% to the gross domestic product (GDP) in most countries and is often the engine of national economies. Agriculture further contributes to export earnings, industrial raw materials as well as serving as a source of livelihoods. Already, the African agricultural

sector suffers due to over-reliance on rain-fed irrigation, poor soils and obsolete technology and farming methods. The agricultural sector is likely to be worst hit as droughts and flooding increase, temperatures fluctuate and growing seasons change.

c. Climate change, biodiversity loss and fragile ecosystems

Forests are key in sequestration – trapping and absorbing carbon dioxide gas - a principal contributor to global warming (accounting for up to three-quarters of the greenhouse gases). Africa is home to 17% of the world's remaining forestland. The forests also support an estimated 1.5 million different species that in turn sustain the lives of millions of people. However, a recent New Partnership for Africa's Development (NEPAD) report shows that the continent's forests are depleting at an alarming rate of 5 million hectares per year. The diverse African population of plants and animals are under immense threat due to habitat loss.

d. Climate change, water scarcity and environmental sustainability

One third of Africa's population already live in drought prone regions and climate change could put the lives and livelihoods of an additional 75 – 250 million people at risk by the end of the next decade. Flood prone areas, such as southern Africa are likely to become wetter and also suffer from more frequent and severe floods leading to diversion of resources from development to emergency relief. Moreover, Africa's coastal fisheries and the fragile ecosystems that support them could also be damaged if higher sea levels push salt water inland and destroy fresh water estuaries and coastal farmland.

e. Climate change and human health

Africa is expected to be at risk primarily from increased incidences of vector-borne diseases and reduced nutritional status. A warmer environment could open up new areas for malaria. Altered temperatures and rainfall patterns could also increase the incidence of yellow fever, dengue fever, onchocerciasis and trypanosomiasis. Higher morbidity and mortality rates in sub-regions where vector-borne diseases increase following climatic changes would have far-reaching economic consequences. In view of the poor economic status of most African nations, global efforts will be necessary to tackle the potential health effects.

1.1.3 The Conference Procedure

The conference adopted a two-phased dynamic participatory process to encourage delegates to actively engage in the process. These were:

- Plenary sessions for presentations on climate change effects and implications for African development, existing strategies for adaptation and mitigation in the selected sectors, and measure for financing climate change adaptation in Africa. Each plenary session was followed by a short brainstorming session to fill existing knowledge gaps and address questions arising from the presentations, and
- A series of facilitated participatory sessions to engage delegates in synthesising the

lessons learned from the presentations, and identifying and prioritising thematic and non-thematic (facilitative) program priorities that would enable the ATPS to make a difference in building Africa's response to climate change by 2020. The facilitated sessions included plenary brainstorming exercises, use of post-it notes, and group discussions.

All outputs were typed word-for-word and analysed through emergent analyses.

1.2: Expected Outcomes

The conference was expected to create a better understanding of the effects of climate change in Africa and the potential contribution of S&T to adaptation. It was also expected to lead to strategies to build Africa's response capacity to climate change. Specific outputs from the workshop included:

- Improved awareness and understanding of climate change and its effects on African agriculture, biodiversity, health systems, water and the environment;
- Better understanding of STI knowledge and information gaps in Africa's response and adaptation to climate change;
- Identification and prioritization of research, training and capacity building needs for tailoring Africa's science, technology and innovation (STI) policies to climate change adaptation;
- Increased inter-regional and international partnerships in support of appropriate STI policy development for effective response to climate change in Africa,
- Strengthened networking amongst the Research organisations, the Private sector and the Public Sector actors working on climate change adaptation in Africa, and
- A set of implementation program priorities for the ATPS Phase VI Strategic Plan, 2008 – 2011.

It was expected that the conference would deliver outputs that would feed into the finalisation of the ATPS Phase VI Strategic Plan, 2008 – 2011 as well as prioritise STI relevant research, policy and practice that may be required to boost Africa's capacity to adapt to climate change effects in selected sectors including Agriculture and Food security, biodiversity conservation, water and environmental sustainability, and human health.

1.3: Venue, Date of Conference and Workshop

The 2007 Annual Conference and Workshop of the African Technology Policy Studies Network (ATPS) was held at the Birchwood Executive Hotel & Conference Centre, Johannesburg, South Africa, from 19 - 21 November 2007.

1.4: Support for the Conference and Workshop

The 2007 Conference and Workshop was organized by ATPS in collaboration with the University of the Western Cape (UWC) and the University of Cape Town (UCT).

2 CONFERENCE AND WORKSHOP OPENING SESSION

Dr Rubin Pillay, the National Coordinator of ATPS South Africa, chaired the opening session of the conference and workshop. He welcomed the delegates to the meeting on Climate Change Adoption emphasizing that the importance of this subject has been reiterated in a conference of G20 Ministers that had just concluded in Cape Town. He welcomed them to Johannesburg and the South African hospitality by extension.



Cross-section of the ATPS management during the opening session

2.1: Remarks from Dr Kevin Urama, Director, ATPS



The Executive Director of ATPS Dr Urama noted that scientists say that a combination of human and natural factors have led to a systematic increase in the earth's temperature and subsequent climatic variations. Although there is debate on the causative factors and adaptive strategies to climate change, there is no doubt that the global climate is changing.

In his remarks he was concerned that the African continent, which is home to approximately 748 million people, has been described as the biggest victim of climate change. This is evidenced by the increased natural disasters, floods and droughts that have been linked to global warming. Experts propose that

climate change will have a dramatic impact in Africa despite the fact that the continent comparatively emits minimal amounts of greenhouse gases.

Currently, there is already increased desertification in Northern Africa; more frequent and longer dry periods threatening crop failure in West Africa and a higher risk of vector borne diseases due to warmer climates. It is even more disturbing that the challenge of climate change is likely to hamper the continent's efforts to meet the Millennium Development Goals especially those related to poverty eradication, food security and environmental sustainability. This is because erratic rainfall patterns and decreasing crop yields are also likely to contribute to increased hunger and diminished labor productivity that may lead to reduced economic growth, therefore exacerbating poverty.

He confirmed that there is an emerging consensus amongst climate scientists, development economists and politicians that poor countries are more vulnerable to the effects of climate change and are also the least able to adapt. He indicated that climate change was likely to have a dramatic impact on Africa despite the continent emitting comparatively minimal amounts of greenhouse gases. Africa is a continent that is highly vulnerable to the negative effects of climate change and there is need to do more than sit back and wring hands in despair. It is important to adapt.

With reference to the 'Climate Proofing Africa' report for G8 Environment and Development Ministers, he said there was a dearth of knowledge on the impact of climate change on poverty alleviation in Africa, and also a lack of scientific and technical capacity within the continent to cope with climate change effects. In addition, at Gleneagles (2005), the G8 Summit mapped out a Plan of Actions that prioritised the need to support developing countries to improve their capacity for adaptation and also called for more access to information on climate change effects and potential adaptation strategies.

He emphasized that ATPS believes that science-based technologies can play an important role in developing effective adaptation strategies and therefore decided to organize the conference and workshop to deliberate on how African countries can tap and adapt the existing S&T policies to respond to climate change. The purpose of the workshop was not to reinvent climate science but instead utilize the gathering of experts and stakeholders to synthesis evidence-based practical strategies for building Africa's capacity to respond and adapt to climate change effects, through science, technology and innovation (STI) systems research, policies and practice. He stressed the importance of moving beyond climate modeling exercises to formulating evidence-based policies and intervention schemes to encourage innovation in the use of both indigenous and orthodox technologies to address the challenges and opportunities provided by the changing climate. Africa, he said, "have an opportunity to take the lead in mainstreaming climate change adaptation strategies in its development agenda, given that many of its economies are still developing. The developed nations provide viable test cases and lessons learned could inform sustainable choices for the developing nations. He advised that African countries should choose a "green" development trajectory which will be environmentally, socially and economically sustainable and equitable. The rich natural resource base of Africa provides a unique

comparative advantage in this area and with the right STI policies and right technologies, Africa can champion a green development agenda that is both environmentally sustainable and economically viable. He stressed that in making these choices, the wealth of knowledge on coping strategies held by the multiple knowledge communities in Africa including indigenous knowledge, religious knowledge, culture, customs and unwritten norms and practices as well as orthodox scientific knowledge must not be discounted. The African farmers, he said, have coped with draughts and flood events for decades and it will be grossly erroneous for orthodox scientists and/or western innovators to presume that the solution to Africa's problems are held in one knowledge community.

Dr. Urama concluded his opening remarks by thanking the delegates for accepting the invitation to participate in the conference. He hoped that the conference will provide an opportunity for participatory dialogue on the very important and urgent subject of how Africa might adapt to climate change to help the ATPS prioritize its research and policy advocacy in the coming decade. He encouraged the delegates to write down any ideas on how ATPS might achieve these objectives in "post-it-notes" provided, as the ideas occur, noting that the process will be facilitated by Ms Diana Pound of Dialogue matters, UK. He stressed that the conference focuses on identifying and prioritizing the specific roles that the ATPS might play is mapping the way forward for Africa as member states grapple with climate change effects.

2.2: Remarks from Dr Osita Ogbu, former Executive Director, ATPS



Dr Ogbu, the former Executive Director congratulated the Secretariat for holding another annual conference and workshop that he hoped would be as successful as the previous ones.

He noted that ATPS is a unique institution where all members are like family and are proud to be associated with the network. ATPS is proud to develop the capacity of Africans to think and be original. Despite ATPS's reliance on donor funding, the Network also ensures that STI policy needs of the continent are addressed through this type of engagement with the key

stakeholders in setting the policy research agenda for the ATPS. He stressed that while Donor priorities are important, these should not drive the research, policy and development agenda for Africa. "Ensuring that our research advocacy and policy agenda are demand driven is a pre-requisite for African development", he said.

He pointed out the national chapters as another unique feature of ATPS terming them as “the backbone of the Network”. The activities of the chapter gives the ATPS Network its character and they should continue to be innovative, supportive to its members and in constant communication with the Secretariat and the Board. He further encouraged the Network members to interact with the national coordinators during the meeting.

He reflected on the difficulties of creating and sustaining the ATPS as an independent institution. The ATPS, he said, is an African institution that prides itself in developing not only the capacity of Africans to think and reflect on Africa’s STI challenges, but also to remain original in mapping the way forward. He noted that the ATPS Network is presently evolving and receiving greater recognition, increasing its association and partnership with other institutions both in Africa and elsewhere. Dr Ogbu expressed his delight to have been associated with the ATPS network and asked the members to be proud of ATPS. He enjoined members to make sure that the institution continues to grow from strength to strength by according the leadership necessary support and rededicating themselves to the work of the Network.

He reminded the conference that the ATPS is a multi-disciplinary Network and is well placed to respond to any development challenge that Africa might face, be it climate change, health innovations, water and environment management, etc. He referred to the November issue of the Economist to underscore the centrality of STI to development. He noted that through STI, China and India are now catching up with Europe, and the world is now looking up to Africa to do the same. He noted that the World Bank, UNESCO, and other international development organizations are now paying increasing attention to STI policy research as the viable option for development. He expressed delight that the ATPS is rising up to the challenge, to ensure that Africa can generate its own knowledge and use that knowledge to solve its development problems. This, he said, is the essence of the conference: to help Africa understand the challenges associated with climate change, think through these challenges, and generate answers to those challenges through STI.

2.3: Remarks from Prof Turner Isoun, ATPS Board Member and former Minister of Science and Technology, Federal Republic of Nigeria

Prof Isoun reiterated the importance of looking at climate change from the perspective of how it affects Africa and how the ATPS can help Africa to adapt to its effects. He noted that the territory of Africa quantitatively is larger than China, USA and Europe put together; a reflection of the scope and the dimension of the challenge. It is important therefore, for the continent to be proactive, both in policy and research; and have a strategy to handle problems of adaptation to climate change in Africa. He stressed that Africa must chart its own trajectory to solve these problems. New technologies must be used where applicable, such as, satellite imaging, remote sensing technology, GIS and global positioning systems. He stressed that Africa must not be intimidated to think that it cannot be at the cutting edge of science and technology due to the rhetoric of poverty and the investment costs required. Cutting edge technologies, he said, would help us solve the problems quickly. By way of example, Prof Isoun gave the example of Lake Chad which was drying up and Africa lacked the technology to detect the emerging catastrophe. The Nigeria SAT 1, he said, is now able to provide detailed pictures of the Lake. This evidence, he said, convinced policymakers to invest in the regeneration of Lake Chad through a number of cost-effective measures, for example, diverting waters from River Congo.



Prof. Isoun also noted that STI could play major roles in adapting to climate change in the agricultural sector to enhance food security. He commended the decision of the ATPS to devote a whole section of the planned dialogue on Agriculture and food security. It is evident that Africa must invest in water resources and develop capacity because it is dangerous to rely on rain-fed agriculture. He gave an example of the Nigerian government which has over the last eight years invested on irrigation technology and ground water harvesting. These investments have yielded great dividends, he said. He encouraged members not to be intimidated by those who may think that Africa is too poor to invest in water resources management, noting that this is central to poverty alleviation and livelihoods improvement in Africa. He noted that reliance on rain-fed agriculture may result in perpetual poverty and food insecurity in the continent.

Prof. Isoun warned that African scientists and policy makers must leave the state of “No Action Talk Only”, a syndrome which dubbed the “NATO Club” and begin to do things

that will make a difference. He drew attention to the overarching question guiding the policy dialogue planned during the conference; “*It is 2020 and ATPS has made a difference to Africa’s ability to adapt to climate change. What do we need to do to achieve this?*” We must continually ask ourselves, what can we do to make the difference as individuals, as corporate organizations, policy makers, etc to achieve this vision. He also noted that some sectors of focus have been identified and enjoined delegates to remain focused and proactive in addressing the questions posed.

He concluded his remarks by briefing delegates on an interview he had with BBC on S&T in Africa. The first question they asked was: “*Is Africa ready for Science and Technology?*” When he responded affirmatively, they enquired: *Are African Leaders ready to Fund Science and Technology?* His response was that African countries have basic resources to fund R&D but they still need help by way of collaboration, however, Africa must find its own indigenous trajectory. “*Just like China and India have created their own trajectory for S&T, Africa must develop its own trajectory. We cannot wait for outsiders, they are our friends, we need them, we will collaborate with them, but we must develop our own indigenous trajectory*”. Drawing on the example of Nigeria’s space technology developed under his leadership in the Ministry of Science and technology in Nigeria, he assured delegates that Africa can do it. “*We developed our own trajectory for ICT and biotechnology and they are working*”, he said. It is not perfect but the controls are there and the same could be done for climate change adaptation technology in Africa. He appreciated the presence of all the delegates and enjoined them to participate in building the ATPS, going forward. He summarized his remarks in three key words, “we need to be *proactive, strategic, and courageous*”.

2.4: Remarks from Jean Woo, Program Officer, Innovation, Policy and Science, IDRC



Ms Woo thanked ATPS for inviting her to attend the conference and workshop in, Johannesburg, South Africa.

She explained that she would be wearing two hats during the meeting, firstly as an observer, given the significance of the climate change topic to the International Development Research Center (IDRC) and the Department for International Development, UK (DFID). The two organizations formed a partnership to work together on climate change adaptation in Africa and she would be representing the IDRC/DFID Climate Change Program Manager at the event, as an observer. She noted that her second hat was tied to the joint strategic external evaluation

which the ATPS and IDRC was carrying out which, would feed into the 2008 – 2011 strategic planning of ATPS.

Ms Woo said that the 2007 ATPS Annual Conference and Workshop in South Africa was her first one and she was looking forward to observing and interacting with the delegates.

2.5: Remarks from Jeroen Rijniers, Senior Policy Officer, Cultural Co-operation, Education and Research Department, the Royal Dutch Government



Dr Rijniers said that his participation at the conference and workshop was mainly to meet members of the ATPS network, interact with the national coordinators and observe the meeting. He noted that the Dutch Ministry is already supporting the ATPS for several years. Our interest in ATPS, he said, is because of the research policy which puts an emphasis on innovation systems.

The Royal Dutch Government had, in the past, supported research institutions as a way of strengthening capacity, but with the new insights such as innovation, the government was laying strategies on strengthening capacity from an innovation system perspective. Mr Rijniers expressed the hope that the ATPS can be of help and a strategic partner in that endeavour.

2.6: Remarks from Prof Norah Olembo, Chair, ATPS Board



Prof Olembo warmly welcomed delegates to the workshop, stating that climate change was a global phenomenon that directly affected diverse sectors of life including agriculture, water, health, infrastructure, industry and commerce. Climate change impacts in Africa is manifest in agriculture and food security, loss of biodiversity, weather-related disasters, disease endemics and water resource stress. Moreover, she told delegates that the African continent, unfortunately, had a track record of being reactive rather than proactive to new challenges. Africa, she stressed, therefore has often been caught flat-footed and unprepared to cope with emerging challenges.

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The biggest challenge of climate change adaptation is the lack of climatic data for vulnerability and risk assessment for decision making and actions. Researchers, scientists and policy makers, have an important responsibility to ensure that the African continent survives the negative impacts of this phenomenon. In light of such gloomy forecasts, she called on delegates to carry out sound and solid research to evidence-based advice for practical interventions and adaptive policies in Africa. Delegates were also encouraged to take lead in conducting African scientific research to better understand climate risks and the most appropriate adaptation options for the continent. It is also important to lobby policy makers to create legislation and develop appropriate policies and coping strategies.

Prof Olembo expressed hope that the workshop would result in improved awareness and understanding of climate change and its effects on Africa's agriculture, biodiversity, health systems and the environment. The deliberations would also be used to identify the knowledge and information gaps in Africa's response and adaptation to climate change and, more importantly, prioritize STI policy research and capacity building needs for the ATPS Phase VI Strategic Plan, 2008 - 2011.

2.7: Keynote Address: Climate Change and Land use Change: Implications for African Development

By

Dr Robin Matthews

Leader, Climate Change Unit, The Macaulay Institute

Africa is probably the most vulnerable continent to climate change and climate variability, not only because of the dependence of many of its economies on agriculture, strongly affected by climate, but also because of the presence of other stresses, such as rapid population growth, land degradation and prevalence of human diseases.

Climate change is likely to impact adversely on agricultural production in many areas by shortening growing seasons and reducing rainfall that will in turn affect the region's food security. Climate change is also expected to exacerbate water shortages already faced by some countries, or to increase the risk of water stress in countries not currently affected. The phenomenon is also likely to affect major ecosystems and changes are already being detected even faster than anticipated in some southern ecosystems. Sea-level rise is predicted to inundate low-lying lands in some countries, with potentially disastrous impacts on coastal settlements. Human health, for example, malaria in southern Africa and the East African highlands, already compromised by a range of factors, could be further negatively impacted by climate change and climate variability. The continent also faces widespread poverty and other factors that have resulted in Africa's low adaptive capacity compared to other continents.

The paper showed that based on the findings of the IPCC 2007 Fourth Assessment Report, Africa's climates, economies and ecosystems have already been affected by global warming and are likely to experience further change. There is an urgent need for African governments, their partners and other stakeholders to plan on how to cope with the impacts of climate change and to help the people of Africa to adapt to these changes. Adaptation is not an option for Africa, but a necessity (Thornton et al., 2006). The challenge lies in the fact that Africa's adaptive capacity is low due to the extreme poverty of many of its people, compounded by frequent natural disasters such as droughts and floods, and poor institutional and infrastructural support.





Delegates pay attention to the keynote presentation

While a certain amount of reactive adaptation will of necessity occur, the design and use of proactive strategies can enhance adaptation. Such strategies should aim at increasing adaptive capacity to climate variability and climate change over the longer term. Ad hoc responses will always be necessary to alleviate immediate problems of food security, but it is important that adaptation to climate change is also factored into longer-term national development plans aimed at reducing disaster risk, poverty and other issues. The important choices to ensure long-term sustainability lie in land use, agricultural practises, institutions, and science and technology capacity.

On land use, there has to be a balance between providing the basic necessities of life such as food, fibre, fuel, water and income, without affecting other ecosystem services such as water quality, food and erosion control, biodiversity and carbon storage, or less tangible services such as aesthetic and spiritual uses. Agricultural practices can be enhanced by extending the range of technological options available to farmers, for them to choose how they adapt to climate change. These include technologies to enhance resilience to drought, including dam building, water harvesting systems to supplement irrigation practises, water conservation practises, drip irrigation, and use of drought-resistant and early maturing crop varieties.

For these options to be effective, one very important choice that governments must make is to provide an appropriate institutional framework to enable people to adapt. Examples of some options that governments may choose include provision of national grain reserves, grain future markets, weather insurance, large scale insurance schemes, food price subsidies, cash transfers, and school feeding schemes (Devereux, 2003). Micro-financing and social welfare grants are other institutional support options that can help if they are supported by local institutional arrangements on a long-term sustainable basis (Chigwada, 2005).

3 CONFERENCE PLENARY AND POLICY PRESENTATIONS

3.1: Session 1: Role of Science and Technology in Climate Adaptation in Africa

This session was chaired by Prof. Lynn Mytelka, an ATPS Board member. There were three presenters: Dr. Ouma of ICPAC, Prof. Tchatat of African Network for Climate Community and Prof Olokesusi who is the associate ATPS national coordinator for Nigeria. The following is an overview of their presentations.

3.1.1: Impacts of a Changing Climate in Africa and Strategies for Mitigation and Adaptation

By

Dr Gilbert Ouma

Lecturer, Department of Meteorology University of Nairobi Kenya



The scientific community agrees that climate change is happening, that emissions of greenhouse gas from human activities are a significant driver of climate change, and that climate change poses a threat to the world's current development.

The main cause of climate change is believed to be the changing concentrations of greenhouse gases in the atmosphere. Therefore, most international efforts on climate change have centred on limiting greenhouse gas emissions associated with human activity, particularly the burning of fossil fuels, such as, coal, oil and gas.

Existing evidence shows that both natural and managed ecosystems in Africa face substantial adverse impacts from existing climate variability, the nature of which will almost certainly be altered by longer-term climate change. There is proof of climate change in Africa in the gradual yet dramatic disappearance of tropical mountain glaciers, such as on Mt Kilimanjaro and Mt Kenya, the drying up of lakes and the reduction of freshwater in the continent and rising temperatures. The impacts, in general, include desertification, sea level rise, reduced freshwater availability, cyclones, coastal erosion,

deforestation, loss of forest quality, woodland degradation, coral bleaching, the spread of malaria and impacts on food security.

Most of the economies of African countries depend on climate-sensitive sectors, mainly subsistence rain-fed agriculture that contributes to 10% to 70% of the nations' gross domestic products (GDP). This dependence on rain-fed agriculture makes production vulnerable to climatic variability and change. Unfortunately, Africa is by far the poorest inhabited continent in the world and, on average many of its countries are poorer than they were 25 years ago. The continent remains mired in poverty and a strangling debt portfolio with the number of people living below the poverty line increasing by over 50% during the last two decades.

From the issues raised above, it is evident that climate change is a reality that must be tackled urgently. It was indicated that even if the mitigating measures are successful, climate change is still bound to happen albeit at a later time. The construction of regional to sub-regional climate change scenarios using regional climate models or empirical downscaling has been limited in Africa mainly due to restricted computational facilities and lack of human resources (Hudson and Jones, 2002; Swart et al., 2002). This problem has been compounded with insufficient climate data over Africa (Jenkins et al., 2002).

There is an urgent need for realistic adaptation options since these can reduce vulnerability, especially where they compliment broader development initiatives. The adaptation options should reduce the vulnerability of environment, strengthen society livelihoods and economic systems, and cope with the consequences of current extreme climate variability and future climate change. Some of these options are described below:

i) Strengthening climate risk management systems

The current climate variability is already impacting negatively on most African countries. There is therefore need to cope with this variability. The suggested adaptation strategy here is the strengthening of the early warning systems through the improvement of the weather and seasonal forecasts, improvement of communication of the information to the users, and mainstreaming of climate risk management into development through government policies and also within the development plans of other users. Indigenous Knowledge must also be taken into account.

ii) Encourage Participatory Action Research

Participatory Action Research (PAR) will provide evidence on the link between climate change and livelihoods that can be used in developing policy briefs for advocacy for mainstreaming efforts. This would lead to a bottoms-up approach in policy development which is very useful during policy implementation stage as the communities will have participated in the policy formulation. PAR will also help in the development and transfer of innovative technologies to help in the adaptation process. The capacity of the

participating community in the use of the innovative technologies would also be built at the same time and ownership of the developed technologies would be ensured. Finally, the PAR will authenticate and document indigenous knowledge on coping that may be transferred to areas under “new” climate regimes resulting from climate change.

iii) *Mainstreaming Climate Change Adaptation into Government Policies*

Climate change is a development issue and should be taken into account during planning stages of development. Policy briefs should be developed based on evidence, gained from the PARs, to influence government policy development. A strong lobby for the mainstreaming climate change adaptation into government policies should be undertaken.

iv) *Knowledge and Information Sharing*

Knowledge and information is very important in trying to combat the effects of climate change. A strategy of ensuring the availability of this information across board is therefore crucial to adaptation activities. The knowledge and information shared would include research findings, relevant Indigenous Knowledge, success stories and best practices from vulnerable communities on how they coped with adversaries. The sharing should be between policy makers, researchers, at risk groups and development partners (donors).

3.1.2: Changement Climatique - Impacts Sur Les Ressources en Eau et la Production Agricole en Afrique De L'ouest et du Centre : Le cas du Cameroun et de la Cote d'Ivoire

[Climate Change: Impacts On Water Ressources And Agricultural Produce In Western And Central Africa: Example Of Cameroon & Côte D'Ivoire]

By

Prof Gabriel Tchatat

Team Leader, Climate Change Adaptation and Agriculture African Network for Climate Community (ANCC), Cameroon



The climatic changes and disruptions are attributed to the continuous warming of the lower atmospheric layer by greenhouse gases. This is a matter of concern for the international community which since the Rio Conference has made efforts to understand the phenomenon and to provide practical solutions.

As part of the international efforts on research and analysis of climate change and its dramatic consequences, a project was developed in the Maroua Basin in Cameroon and the Odienné and Korhogo basins in Côte D'Ivoire. This project was constituted under the theme of: *Climate Change – Impact on water*

resources and on agricultural produce in western and central Africa: the example of the Odienné and Korhogo basins in Côte d'Ivoire and the Maroua basin in Cameroon.

The project was focused in the inter-tropical zone in West Africa, which encompasses Cameroon and Cote d'Ivoire. The choice of this location is because it is very susceptible to desertification, and the regular rainfall deficit has serious consequences on agricultural produce (Hansen *et al.*, 1983). There is also availability of certain meteorological, hydrological and agricultural data over a long period in these regions. The main objectives of the project are:

- To determine climate change in the 3 basins;
- To determine the impact of climate change on water resources in one of the basins, and on agriculture in each of the 3 basins;
- To make recommendations for a general policy on climate change adaptation.

To attain these objectives, the first part of the project was designed to assess climate change impacts in three river basins. The second part focused on the methodology showing the different tools and the techniques for estimating the impacts of climate change on agricultural production in the Korhogo, Odienné and Maroua basins. This involved modeling the impacts if variations in climatic parameters such as precipitation/water resources, temperature, Carbon dioxide, etc on agricultural productivity over a long period (approximately 90 years). This information will provide the governments of Cameroon and Côte D'Ivoire, and local communities with an opportunity to elaborate and adjust their development policies. In addition, it will enable better management of water resources for the well being of present populations and future generations. Essentially the findings of the project will help determine the range of variation of climatic parameters and their impacts on water resources and agricultural production in West Africa.

This project used different modeling techniques such as the General Circulation Models (GCM) and the WatBal model (Water Balance Model). These technologies are used to determine long term climatic parameters, as well as the availability of water resources over a long period. Through the technique of updating data collected in the field, it was possible to predict the agricultural produce in the hypothesis 1 x CO₂ and 2 x CO₂.

On the basis of a doubling of the atmospheric density (equivalent 2 x CO₂) of greenhouse gas in the year 2075, the project determined the amplitude of the variation of climatic parameters and their impacts on water resources and agricultural produce in West Africa.

3.1.3: How to Use Innovative Financing Mechanisms to Mitigate Climate Change-induced Natural Disasters in Africa

By

Prof Femi Olokesusi

Director, Nigerian Institute for Social and Economic Research (NISER), and
ATPS Associate National Coordinator, Nigeria

Natural disasters represent a development challenge because they can have far-reaching consequences on a country's macro-economy and also affect public finances. The 2007 reports of the Intergovernmental Panel on Climate Change (IPCC) confirmed that the world will continue to experience natural disasters. Africa is considered to be the most vulnerable continent to the impact of disasters. Statistics show that seven of ten countries that are most vulnerable to drought are in sub-Saharan Africa (SSA). These include Ethiopia, Sudan, Chad, Mozambique, Mauritania, Somalia and Madagascar. The continent is also prone to floods, storms, droughts, landslides and avalanches.

The general objective of this presentation was to show how African countries can reform their policies on natural disaster risk reduction by incorporating innovative funding mechanisms. Previously, disaster management policies and interventions focused on relief and other post-disaster management issues. The UN General Assembly declared 1990-1999 as the International Decade for National Disaster Reduction (IDNDR). Since then, the global community has taken up the Disaster Risk Reduction (DRR) approach to disaster management. DRR is the systematic development and application of policies, strategies and practices to minimize vulnerabilities and risks throughout a society and avoid or limit (mitigation and preparedness) the adverse impact of hazards, within the broad context of sustainable development (ISDR, 2002)

In 2004 the New Partnership for Africa's Development (NEPAD) Secretariat facilitated the preparation of the Africa Regional Strategy for DRR. Major approaches of the strategy include public-private partnership, insurance and resource mobilization. Most African governments are signatories to the *Hyogo Declaration and Framework for Action 2005-2015: Building the resilience of nations and communities to disasters*. Section F of the Hyogo Framework emphasizes partnerships to implement schemes that spread out risks, reduce insurance premiums, and expand insurance coverage to increase financing for post-disaster reconstruction and rehabilitation. It specifically reiterated the need to encourage a culture of insurance in developing countries.

Current approaches to financing natural disasters in Africa are marked by dependence on international development partners for funds during emergencies, poorly developed insurance mechanisms, slow release of funds by government and development partners, misapplication and inefficient use of available funds and the existence of a "resource gap" due to inadequate funds even when governments have to borrow from local and international financial institutions.

On a positive note, several opportunities exist for financing natural disasters ranging from budgetary provision to innovative risk transfer mechanisms like insurance and its advanced variants like catastrophic bonds and weather derivatives. Some innovative financing mechanisms (IFMs) include:

- Non – catastrophic insurance,
- Catastrophic insurance,
- Catastrophic bonds,
- Accessing United Nations Framework Convention for Climate Change’s Clean Development Mechanism (UNFCCC’s CDM),
- National Disaster Risk Reduction Trust Fund, and
- Better harnessing and managing bilateral and multilateral assistance.

The United Nations Framework Convention on Climate Change (UNFCCC) has a clean development mechanism (CDM) and has set up the concept of carbon trading that allows dirty industries to buy pollution rights from a country with low emissions by investing in green projects. However, under the carbon trading Program, a firm may find it cheaper to plant adequate trees of appropriate species in one or more African countries to absorb 12 tonnes of carbon pollution.

This scheme has become a US\$22 billion industry with Africa accounting for less than 2%. It has good potential if carefully explored and could create job opportunities. This financing mechanism can be established and managed under public private partnerships (PPP) arrangements. India, Mexico and the Philippines have established calamity funds (typically as budget line items to deal with annual appropriations) to deal with the ongoing risk of smaller, more frequent disasters. In addition to this source other potential sources of finance are discussed below.

Some of the policy issues are that financial resources could be mobilized for carrying out DRR activities, such as hazard monitoring and forecasting, strengthening early warning and communication systems, preparing contingency plans and organizing shelters. In addition, risk transfer mechanisms, such as catastrophic insurance and cat bonds and their variants can be justified because of the disaster problem in a “fragile” continent and inability of the local private insurance industry to venture into these novel areas without government involvement. However, most African countries are undergoing diverse policy reforms aimed at reducing the cost of governance, the “true” cost of government mandated and/or voluntary insurance schemes becomes a real policy issue. Economic reasoning holds that there are some situations in which insurance should not be available or be so expensive that individuals will not want to subscribe to it.

The important policy issues that should be addressed are:

- What *quid pro quo* would taxpayers get for providing a financial backstop for the insurance industry?

What is the role of the sub-national (provincial government) insurance departments vis-à-vis national insurance departments?

Is the current insurance regulation conducive to creating private sector incentives for mitigation?

Who subsidises who?

The areas suggested for further research are;

A study to better understand individual decision making processes in areas prone to natural hazard. More often than not most Africans perceive the probability of a disaster causing damage to their property as quite low.

Therefore, they believe it is not quite worthwhile to get insurance cover. The various risk transfer options could be examined in this context.

Disaster risk mitigation measures have both benefits (e.g. reduction in property damage, direct cost of relief), and indirect benefits (e.g. reduction in business interruption losses). In order to prioritise loss mitigation measures, it is important to understand the expected costs and benefits associated with a specific mitigation measure and quantify their costs and distribution.

Africa has experienced many natural disasters; attempts should be made to quantify the costs associated with future disasters.

3.1.3.1 Issues Arising from ‘Presentations in Session I

Questions and Comments	Responses
The presentations have been very excellent and detailed. If we have these many scientists and scholars conducting research and presenting such information then how is it that there is a problem of human and institutional capacity?. What does it mean?	<ul style="list-style-type: none"> For any development to take place there is a critical mass of trained capacity that a country must have. It takes many engineers to get just one product out, so taking this final perspective we can rightfully say that currently the required critical mass does not exist in Africa.
Apart from managing negative impacts of extreme climate change does ICPAC also look at the positive climate change aspects?	<ul style="list-style-type: none"> In the beginning the original objective of the Drought Monitoring Center (DMC) was to monitor the negative impacts of climate and make use of the good years. The focus is used in planning so that in the event of drought, there is a plan. In case of good rains the farmers are then advised accordingly and in this way ICPAC is taking care of the good aspects also. There are many examples of positive impacts of climate change, for example, the increase in the greenhouse gases has had an impact on

	<p>the photosynthesis. These effects are not permanent because the hotter it is, the more stressed the trees get. We have to study the effect on the productivity because the trees that used to produce fruits twice in a year are now producing fruits once. There is a change and we should know if it will last.</p>
<p>Several important suggestions have been made on how Africa might fund climate change adaptation strategies and disaster management. What steps are needed to make sure that governments adopt some of the suggested ways of increasing funding for disaster management?</p>	<ul style="list-style-type: none">▪ ATPS has been developing capacity and intensifying advocacy in many aspects of STI for African development. This has yielded results in some countries. For example, in Nigeria, under Prof Isoun and Dr Osita, the Nigerian Chapter got most Parastatals in the Ministry of Science and Technology to develop policies and strategic implementation plans. The Nigerian Federal Ministry of Science and Technology continues to collaborate with the ATPS in many aspects, including advocacy for policy change, training of government officials, etc. One suggestion on how to ensure buy-in by national governments is to package information on climate change, risk management and others outputs from this conference and then find ways of communicating this to national governments, through the Internet, emails, dissemination workshops, and policy briefs. One hopes that that these messages will fall within the ear of a minister or a technocrat to bring about change.
<p>Are there any studies on the energy uses and it's effect on the climatic changes in the region? For example, over 70% of energy used in West Africa is fuel wood. The implications on climate change through deforestation, GHG emissions, etc are unclear.</p>	<p>A study on the negative effects of using wood as a source of energy should be carried out. Fuel wood pollutes the atmosphere and it also destroys other areas. If 80% of families south of the Sahara use wood to cook, the effect may be significant. We can come up with a strategy that will help the people to find another source of energy, such as photo-thermo energy. We should help African countries to look for ways of saving and using energy sources that will not pollute the environment.</p>

<p>Are there studies on the nexus between economic growth and ability of countries to adapt to climate change? One expects that growth informs ability to finance these adaptation and mitigation strategies, and too much talk about climate change may disadvantage the poor countries which needs growth.</p>	<p>This is an ongoing debate. On one hand, growth enhances ability to adapt, but on the other hand it comes with climate change and associated consequences which limit growth. We have seen for example, increased floods and draught events in the recent decade and the multiplier effects of these on national incomes could be enormous. Climate change adaptation and economic growth could be mutually beneficial depending on the growth paths which countries take. Africa should also seek to receive compensatory payments from the major polluting countries and use this to finance sustainable growth. We should seek to help Africa come up with sustainable development paths (i.e. green economies) which can lead to savings and growth. Solar energy, alternative cropping systems, etc are ready options that come to mind. ATPS should liaise with regional bodies such as NEPAD, AU, UNEP, etc to push this forward.</p>
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Dr. Urama concluded the session by informing the meeting that the ATPS is already developing linkages with like minded institutions including the UK parliamentary Office for Science and Technology (UK-POST) and SCIDEVnet on how to bridge the policy link through training of Parliamentary staff in the communication of STI to Parliamentarians; and with CTA on capacity building for African Youths and Women in STI. He noted that the ATPS is increasingly engaging likeminded institutions such as Macaulay Institute, WWF, IGAD Climate Prediction and Application Centre (ICPAC), and many others to address these challenges. He noted the need for a policy brief to communicate the outcomes of the conference and promised to take this forward with a panel of experts which will be constituted after the meeting.

3.2: Facilitated Session 1

The plenary presentations were followed by participatory sessions facilitated by Ms Pound, Dialogue Matters, UK. These sessions were designed to engage delegates in different types of participatory processes in order to address pertinent issues arising from the presentations. The facilitated sessions were guided by a number of questions which were addressed through different participatory techniques, including brainstorming exercises, use of post-it-notes, group discussions, etc.

Session I ended with a brainstorming exercise to provide a vision on what the ATPS could do to make a difference in building Africa's capacity to adapt to climate change by 2020.



Delegates engage in a brainstorming session 1: visioning what the ATPS could do to make a difference in building Africa's capacity to adapt to climate change

Ms. Pound explained that the delegates are requested to put their thoughts on the post-it-notes and stick them on the wall under specific themes and questions. The purpose was to build on the presentations and get the groups thinking more about STI policy response to climate change in order to identify what the ATPS should and can do to build Africa's response capacity. She encouraged delegates to put all ideas on the post-it-notes as these may trigger other ideas for other delegates.

The visioning exercises were framed around four working themes already identified by the conference team:

1. Climate Change, Food Security and African Agriculture
2. Climate Change, Biodiversity Loss and Fragile Ecosystems

3. Climate Change, Water Scarcity and Environmental Sustainability, and
4. Climate Change and Human Health.

Under each of these themes, there were a series of questions written on flip charts to guide the visioning exercise and to help delegates organise their thoughts and ideas based on areas of comparative advantage and expertise. The guiding questions include:

1. It's 2020 and ATPS has made a difference to Africa's ability to adapt to climate change, what do we need to do to achieve this?
2. What are the key issues for this subject in Africa?
3. What are the first steps in turning the idea into a thematic policy research project and/or interventions?
4. Who in that discussion group could do what and when to move this forward?

Question 2 was tailored to suit each of the thematic areas identified. For example, for the climate change, food security and agriculture theme, the question read: "*What are the key issues in agriculture and food security in Africa that needs to be addressed to make the difference?*".

Questions 1 and 2 above were designed to help the delegates visualise the likely impacts of climate change in Africa by 2020, what the key challenges are now and what ATPS could do to make a difference in building Africa's capacity to adapt to these climate effects. Delegates were encouraged to think laterally and put down all ideas that may cross their mind during the presentations and/or group discussions to ensure that all aspects are considered. On the other hand, questions 3 is designed to assist experts in specific themes to identify and prioritize key Programs and/or activities that the ATPS can take forward to achieve the vision of making the difference by 2020, concretise the first steps for turning these ideas into concept notes for practical programs. Question 4 is designed to ensure that actual responsibilities for taking forward the identified first steps are assigned to specific ATPS members and or partners to ensure effective follow-up.

Finally, Ms Pound reminded the delegates of the six strategic priorities of the ATPS Phase VI, 2008 – 2011 and encouraged them to frame their thoughts around what the ATPS **can do** within its vision, mission and the strategic priorities. The strategic priorities are:

- Research and research capacity building
- International cooperation and partnership
- Youth and gender empowerment
- Training and sensitization
- Science communication and stakeholder dialogue
- Outreach, knowledge brokerage and policy advocacy

The first phase of the brainstorming exercise required each participant to write two ideas addressing questions 1 and 2 above, on different post-it papers based on lessons learned

from the plenary presentations. The second phase of the brainstorming exercise required each participant to visualize ATPS in 2020 having made a difference to climate change adaptation in Africa, and write down two policy research, capacity building or policy advocacy programs that are key to achieve this mission. These were collated and grouped for further discussion in break out groups with a specific focus to the six strategic priorities of the ATPS Phase VI, 2008 - 2011.

The brainstorming exercises produced significant materials which helped shape the group discussions the following day.



Outputs of Brainstorming session 1

These outputs are summarised below:

3.2.1 It's 2020 and ATPS has made a difference to Africa's ability to adapt to climate change, what we need to do to achieve this?

The conference came up with a number of strategies for the ATPS to make a difference in Africa's ability to adapt to climate change by 2020. Some of the suggested strategies include:

1. *Institutional Collaborations and Partnerships:* Majority of the delegates suggested that a lot of research has been carried out in the area of climate change science and much is already known about its potential impacts globally. However, these efforts are not consolidated as different institutions implement their own research agenda and also pay little attention to results dissemination and policy advocacy. Climate related STI policy research capacity in Africa is still at its nascent phase, and many institutions do not provide the vital policy links which is required to translate research outputs to the necessary adaptation technologies and innovations that could make a difference. ATPS should therefore facilitate collaboration with the existing institutions and networks in Africa and elsewhere to:
 - Build the STI policy research knowledge and capacity of African institutions and the ability of rural communities to respond to climate change through collaborative efforts, focusing on the STI dimensions. A number of institutions were identified including, UNEP, WWF, IGAD Climate Prediction and Application Centre (ICPAC), IPCC, WHO, Local NGOs, and many others.
 - Provide knowledge brokerage services for international organizations and other NGOs by communicating vital climate change science information emerging from their work to policy makers, the private sector and the local communities to foster behavioural change at all levels. There was an emphasis that ATPS must ensure that the research results from these institutions trickle down to the grassroots through its Knowledge for Development/Science Communication Programs.
2. *Training and Research Capacity Building:* it was noted that the ATPS should provide training and research capacity building in the following areas:
 - Primary methodologies for carrying out STI policy related research and climate modeling for policy advocacy, e.g. the use of remote sensing, geographic information systems techniques (GIS), and satellite imagery to design adaptation options and policy interventions; the role of indigenous knowledge and alternative technologies in climate proofing Africa, and national innovation systems for climate change adaptation focusing of integrated approaches that achieve economic growth for poverty alleviation as well.

- Provide platforms for regional participatory action research Programs on several issues identified under the thematic subjects by the break out group of experts. There was a general consensus that these research Programs should not seek to re-invent the wheel but rather focus on innovation systems studies to strengthen the National Innovation Systems and capacity of African states to cope with climate change. Suggested broad themes for regional Programs includes:
 - o Understanding and using indigenous knowledge systems for climate change adaptation in selected sectors, including agriculture, biodiversity conservation, water and environmental management, and health.
 - o Understanding and using national innovation systems for change adaptation in the sectors named above.
 - o Development of sustainable adaptation technologies and early warning systems for disaster management.
 - o Development of appropriate policies for climate change adaptation including provisions for appropriation strategies and intellectual property rights for indigenous African technologies and genetic resources, knowledge and technology transfers, etc.
 - o Appropriate mechanisms for financing climate change adaptation in Africa, including the polluter pays principles and appropriate compensation systems.

Measures to take these forward are described briefly in the following sections discussing the outputs of the expert break out group discussions.

3. *Science Communication and Policy Advocacy*: Majority of the delegates recommend that ATPS should intensify its science communication, policy advocacy and outreach Programs to:
 - Engage schools in awareness creation Programs on various issues relating to climate change and viable adaptation strategies,
 - Assist rural communities to develop and use appropriate mitigation and adaptation technologies, e.g. the use of treated nets to prevent malaria in affected regions, use of drought resistant crops in semi-arid areas, targeted mixed cropping and use of emerging technologies to mitigate the impacts of climate change, the use of ICT for early warning systems in agriculture, flood risk aversion, etc. Generally, the conference delegates felt that the ATPS could make a difference through intensified advocacy to assist policy makers, the private sector and rural communities to embrace the need to develop alternative technologies for climate change adaptation in Africa,
 - Engage national governments to ensure that they take necessary actions to mitigate climate change effects and promulgate adaptation strategies.

- Devise communication methods that would get most of the research outputs to the user communities, i.e., communication methods that work down at the grassroots levels.
4. *Curriculum Change in STI Institutions and University Departments:* Some delegates suggested that the ATPS could make a difference by advocating for the re-orientation of the curriculum of STI institutions to include climate change adaptation technologies and innovation studies.
 5. *Knowledge Brokerage:* It was suggested that the ATPS should identify and document successful stories in using STI for climate change adaptation elsewhere and share these with key actors to advocate behavioural change
 6. *Strengthening the Policy Link:* The ATPS should actively engage policy makers and relevant government ministries to advocate for and assist in drafting climate change adaptation policies and implementation strategies at the national levels. It was suggested that the ATPS should allocate both financial and human resources to this activity to ensure success. ATPS also needs to work with regional bodies such as NEPAD, COMESA, AU, WATERNET, WAFSA, NBI, etc to build institutional capacity in linking science and policy, STI networking, etc.

It is noteworthy that the synthesis analyses presented above have focused on elements of the dominant contributions relevant to the strategic priorities of the ATPS Phase VI Strategic Plan, 2008 – 2011, only. The six core areas therefore reflect the author's interpretation of the majority of the post-it notes.

Based on this analyses, the outputs of the first brainstorming session suggest that the ATPS can make a difference to Africa's ability to adapt to climate change by providing: (i) the vital policy link which is missing in existing Programs by other institutions; (ii) capacity building and training in STI policy research for climate change adaptation, (iii) knowledge brokerage services, (iv) science communications and policy advocacy, and (v) strengthening the linkage between climate research and policy in Africa. International collaboration and partnerships, including south-south and North-South collaboration was also recommended.

The results of the analyses of the specific actions that the ATPS should take under the for thematic areas noted above are discussed under the Expert break out groups. This is necessary as the ideas generated through the brainstorming exercise were further probed by the teams of experts in the respective subject areas in order to synthesis prioritise the key issues in the subject area in the light of existing knowledge, identify the first steps in turning them into thematic policy research Programs, projects or interventions, and allocate responsibilities for taking them forward in the implementation of the ATPS Phase

VI Strategy. The later exercise included identification of potential institutional partners and Resource Persons.

3.3: Plenary Session II: Experiences and Evidence from the Field

This session was chaired by Prof. M. Madukwe of University of Nigeria. There were three presenters: Dr. Manyatsi of University of Swaziland, Dr Maiga of Universite de Bamako, Dr Musonda of WWF and Prof. Chimbari of University Lake Kariba Research Station. The following is an overview of their presentations.

3.3.1: Climate Change Impact on African Agriculture and Implications for Food Security in the Continent

By

Dr A.M. Manyatsi

Senior Lecturer, Faculty of Agriculture, University of Swaziland



Climate change is one of the main challenges facing human kind, and is a major threat to world food security. Developing countries that highly depend on agriculture are at risk, yet these countries have contributed the least to the problem of climate change. The impact of climate change to agriculture and food security in Africa includes reduced agriculture production, loss of area for agriculture, destruction of agriculture products, loss of human resources for the agricultural sector and loss of income.

Studies confirm that Africa is one of the most vulnerable to climate change variability because of multiple stresses and low adaptative capacity. Sub-Saharan African (SSA) countries are especially vulnerable economically, socially and environmentally to climate change since most of their population rely on agriculture. In addition, most people in Africa spend a large proportion of their disposable income on food, with those in southern Africa and the Indian Ocean spending as much as 57%. A large percentage of Africa's population depends on food aid, for example, about 40% in some southern Africa countries.

Climate change models show that countries, such as, South Africa and Mozambique will substantially lose some of their agricultural potential due to climate change. On the other hand, countries such as Kenya and Uganda are winners in the sense that they will be able to benefit from increased production potential (AllAfrica.com, 2003). Some adaptation to current climate variability is taking place; however, this may be insufficient for future changes in climate.

Adaptation measures should include making the best use of climate as a resource by enhancing capacity of agriculturists, agribusiness and organizations to respond to climate variation and change. Adaptation and coping with climate change involves a range of social and economic factors, and technological solutions. The success of climate change adaptation strategies will depend on several factors, including community awareness of climate change and its impacts, institutional set-up and capacity for implementing adaptation strategies and availability of funds to implement adaptation strategies.

A study undertaken by Manyatsi (2007) on community perspectives and policy response on climate change in Swaziland found that there was lack of awareness, among policy makers and the community, on the risks posed by climate change and how these risks relate to development priorities. The communities in the study regarded climate change as a global problem, and failed to connect it with their own interests and activities. Moreover, the commercial media did not consider climate change stories as saleable unless the issues were accompanied with disasters, such as floods and famine where lives were lost.

Manyatsi (2007) also observed that there was no policy that addressed the issue of climate change in Swaziland. Policy makers should formulate policies that address current vulnerabilities and development needs, as well as potential climate risks. A multi-stakeholders coordinating committee, chaired by a senior ministry official, should be established in each country to manage adaptation strategies. Non-governmental organizations (NGOs) and the media should play a dominant role in building awareness and capacity at the local level. Donors should provide incentives for developing countries governments to take particular adaptation actions, appropriate to local contexts.

The study recommended the following steps to increase the awareness on the impact of climate change on agriculture and food security, and to facilitate successful implementation of climate change adaptation strategies:

- Funds should be made available to support review of current policies aimed at managing and coping with disasters, including hydrological and environmental disasters. The review should aim at updating policies to include climate change and climate change adaptation issues. In some cases specific policies addressing climate change and climate change adaptation may need to be formulated.
- Financial and technical support should be provided for capacity building in developing policies to address climate change and climate change adaptation. The capacity building could be in the form of training workshops for the different sectors, including policy makers, civil society, researchers and the media. It should be facilitated by experts in policy making and climate change issues.

Funds should be made available for promoting awareness of the impact of climate change. The awareness promotion could be done through partnership with the media and the NGOs.

3.3.2: Perte de Biodiversité et Ecosystèmes Fragiles: Cas du Mali *(Biodiversity Loss and Fragile Ecosystems: The Case of Mali)*

By

Dr A. Bayoko and Dr. M. H. Maïga

Ecologue, Enseignant-Chercheur à l'ISFRA, Université de Bamako, Mali



Mali's ecosystem is gradually deteriorating with serious effects on the country's biodiversity. For example, 58% of Mali's surface area is covered by the desert; and 30% of its territory threatened by the advancement of the Sahel which is attributed to climate change.

The word "biodiversity" is the combination of the two words "biological diversity". Biodiversity is important in all ecosystems, including "natural" ecosystems such as national parks or the natural reserves, and man made ecosystems such as farms, plantations or urban parks. Biodiversity is furthermore the basis of many

benefits provided to human beings by the ecosystem. The extinction of an important species can disrupt services and change the interactions between species. This can also have negative effects on the processes linked to ecosystems.

Biodiversity, especially the diversity of plants and landscapes, influences the local, regional and global climate. Consequently, changes in land use and plant cover can have an impact on both biodiversity and climate. In sub-Saharan Africa the interaction between the beneficial role of plant cover in the Sahelian pluviometry and the operations of carbon sequestration through the protection of forests and reforestation is important and worthy of mention.

The presenter analyzed the deterioration of the Malian ecosystems and biodiversity in three parts:

- i) Description of Mali's climatic conditions and the state of its biodiversity;
- ii) the effects of drought on ecosystems and biodiversity; and
- iii) a literature review of the impact of biodiversity on climate.

Climate change in Mali is manifested by rising temperatures and decreased precipitation. This contributes to loss of biodiversity in the long run. In fact, studies in Mali indicate that climatic changes have modified the physical systems, such as, water courses; and had an impact on numerous species as well as entire ecosystems. Climatic changes furthermore manifest themselves through global modifications of functional processes of the biodiversity that subsequently disrupt the carbon cycle as well as the productivity of ecosystems.

In Mali, about 10% of territory has been declared protected zones to safeguard the biodiversity. There are also soil conservation initiatives, for example, to reclaim the soil and reduce erosion of the biodiversity. A huge tree planting program was initiated but curtailed largely by lack of sufficient water. There are programs to exploit underground water sources but they are still inadequate, for example, in the Ulemedan basin. Some have initiated research on how to manage the drought issue but again these are largely inadequate

In conclusion, the presenter noted that the impacts of climate change on biodiversity could be multifarious and stressed that urgent measures are required to mitigate and adapt to these effects today for sustainable ecosystems tomorrow.

3.3.2.1 Issues Arising from the Presentation

Comments	Questions	Responses
	How does management of pollution become more difficult and costly under changed climate conditions?	We should be aware that in most cases we use water to dilute the pollutants. If there is no water, for example, in rivers where the pollutants tend to be dumped, it will be more difficult to dispose them.
	Are there any advantages we can get from climate change? Are there sectors, regions, or places that take advantage of climate change because of temperature change?	Some sub-tropical areas are going to see a situation whereby they will be able to grow some horticultural crops that could not be grown under other conditions because they required less frost. Regional mapping of the impacts of climate change may be necessary.
Mali is a Sahelian country in the heart of this problem of climate change. Last week there was a regional workshop on climate change and Dr Maiga is going to give us information on the various questions that were asked concerning climate change in Mali.	We have heard so much about climate effects, are there any measures any measures to combat the effects of climate change in Mali (and/or in other African countries)?	Concerning the measures that have been taken against depletion of biodiversity, we have worked for the last 30 years to achieve results. There is research on adapting new crop varieties to climate change but these are not enough. In Mali we are trying to increase the areas that are under protection. There is currently up to

		10% of territory under biodiversity protection. There are also soil conservation activities where soil is reclaimed and erosion of our biodiversity reduced. The ATPS needs to support these initiatives to ensure positive impacts.
	The results from Mali are the same as those presented earlier but more serious. Are there any efforts to exploit the underground water resources to try and mitigate the effects of climate change and the loss of species because of lack of water? Is it possible for Mali to try to resolve this problem and divert this catastrophe?	Mali has a big program on tree planting but one limiting factor is water. We have tried to have a reforestation program. There is also another system that explores underground water systems. These programs are still inadequate and there are other research programs that are being carried out so that we can take care of the drought.
	Are there any activities going on to try and conserve the total disappearance of fauna and flora, either in botanical gardens or zoos?	The flora and fauna are disappearing in one ecosystem and then they reappear in another eco-system. There are plants that have disappeared in the Sahelian ecosystem that can now be found in the Sudanese ecosystem. There are also some that have disappeared from Mali; we do not have giraffes. They disappeared from the Malian ecosystem and territory.

3.3.3: Adaptation of Local Communities to Climate Change within Water Scarce Regions: The Case of the Lake Bogoria Catchment in Kenya

By

Dr Musonda Mumba

Fresh Water Programme Coordinator, WWF-EARO



Climate change is already threatening ecosystems in Africa with severe consequences. Poor people that depend on these ecosystems need help to strengthen their capability to adapt to this change. This presentation was based on a case study in the middle Lake Bogoria catchment where the World Wide Fund for Nature (WWF) has been engaged in a water resources management project.

Lake Bogoria is one of several Rift Valley lakes located within the East African Rift Valley. The lake and its wider catchment are rich in natural resources that include the lake itself, forests, wildlife and pastures. Both the upper and middle catchments have experienced an increase in population and changes in land-use over the years. Rainfall variability over the years has compounded the problem even further. However, like many agricultural zones of Kenya, the problems are further exacerbated by uncontrolled, illegal over-abstraction of water resources. These factors have had enormous pressure and effect on the environment and particularly water resources.

The Lake Bogoria case study aims to show how local farming communities in the middle catchment are adapting to climate change following highly variable rainfall patterns and reduced flows in the Wasages River as a result of over-abstraction. WWF recognizes the importance of adaptive strategies by local communities and believes that partnering with various stakeholders is environmentally sustainable especially for water resources that are climate sensitive.

Working with various partners and stakeholders, such as the Department of Irrigation, local community based organizations (CBOs) and the Water Resources Users Associations (WRUA), WWF engaged with the communities within the middle catchment to find a solution for better water resources management. The WRUA is a representative group consisting of members of various common interest groups and the community at large whose main interest is to discuss water related issues. This forum is an effective medium for participatory management of water resources.

Communities in and around the scheme area through their engagement with WWF and department of irrigation decided to dig pan dams for water storage and use during the dry period so as to let the river flow. Irrigation department in partnership with WWF and

Fisheries department provided training and sensitization for the communities within the Lari-Wendani to develop water pan dams on their individual farms then stocking them with Tilapia and cat fish (See picture below). As an incentive to the farmer the Fisheries department integrated fish farming into the activity hence providing additional income to the farmers. During the rainy season between April and September the farmers would then harvest storm flow and stock fish. At the end of the period farmers harvest would fish and use the stored nutrient rich water for irrigation during the dry season (October to March) without interfering with the river.



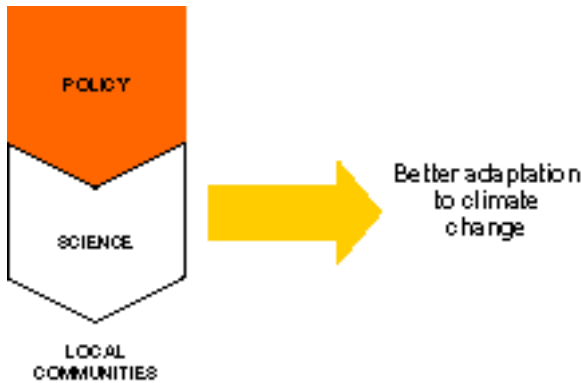
Rain filled pan dam (left) and releasing fish into a pan dam (right). Photo credit: WWF-EARPO/Musonda Mumba

This adaptive strategy by the local communities has had positive consequences for the community and the environment. One key lesson is that community-based approach is effective in developing appropriate adaptive strategies especially for vulnerable communities. WWF is, therefore, working closely with the local communities within the Lake Bogoria catchment on issues related to irrigated agriculture and the new National Water Resources Management Strategy (2007-2009) that clearly indicates the need for reserve water within river courses.

This case study takes cognizance of the fact that adaptation is necessary particularly within water scarce areas where communities are likely to be most vulnerable. Moreover, it is clear that the local communities need the right and appropriate information on adaptation models. WWF and the different stakeholders have served as change agents within this catchment, which is an essential element to adaptation.

WWF's approach to environmental sustainability has been to advocate for integrated water resources management (IWRM) mechanism within this catchment. The water and agricultural sectors are climate sensitive and this case study illustrates the need to mainstream climate change adaptation policies into these sectors; similar cases are lacking or unknown. It is particularly important for the environmental and developmental NGOs

and civil society groups to share lessons about community-based adaptation. Once such lessons and experiences are shared and known, it would be easier to influence governments about the necessary policy changes on climate change adaptation.



Dr Mumba gave a figurative illustration of the importance of linkages between policy, science and local communities. National and international policy structures are important in supporting community adaptation to climate. These can be supported by the best available science and knowledge structures however local communities also need to be linked to such structures (Yamin, *et al.*, 2005).

Making linkages between Policy, Science and Local community engagement in climate change adaptation (Mumba, 2007)

Prof. Isoun expressed delight at the participatory approaches taken by the WWF in combating climate change effects, noting that it is crucial that scientists begin to think of how their research impacts on livelihoods at the local levels. He expressed his wish to see the ATPS actively taking results from STI policy research to the rural communities to ensure positive impacts. Finally, he stressed that the interface research institutions, their results, and communicating these to rural communities is a huge area where the ATPS could make a difference through its Knowledge for Development and Science Communication Programs. Dr. Dube seconded the comments by Prof. Isoun, noting that the ATPS need to focus more on utilizing local expertise in their programs to ensure effective community engagement. Prof. Chimbari also added that working with local champions is crucial to successful integration of local communities in ATPS research and training activities.

3.3.4: Coping with Impacts of Climate Change on Health

By

Prof M. Chimbari

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It is important to distinguish the influence of weather, climate variability and climate change to understand the impacts of climate change on health and the subsequent adaptation strategies. Weather is the short-term changing condition of the atmosphere; climate is the long term average state of the lower atmosphere and the associated characteristics of the underlying water or land in a particular region; and climate variability is the spatial and temporal variation around the average climate (WHO, 2000). The impacts of these three parameters on health cascade from the effects on weather to the effects of climate variability and finally to the sum total effects of climate change. The

presenter described some of the impacts of climate change on human health. He argued that developing countries and African countries, in particular, will be affected most by climate change.

Temperature, humidity, rainfall, soil moisture and the rising sea level are changes in climate that have implications on disease transmission. Change in precipitation, run-off and variability will lead to greater water stress resulting in increased incidence of water borne diseases associated with flooding and forced movements. Increases in temperature and humidity will increase rates of reproduction and survival of bacterial, protozoan and viral pathogens, for example, salmonella and shigella. Scarcity of water may also be a motivation for intensifying irrigation thereby increasing the risk to farmers of contracting schistosomiasis. On the other hand, flooding may result in acute health impacts for vulnerable groups through increases in infectious diseases as a result of crowding of survivors, often with limited shelter and access to potable water. Climate change will further modify the transmission of vector-borne diseases, such as malaria and dengue fever by influencing the dispersal, reproduction, maturation and survival rate of vector species.

Other indirect climate change related impacts on health include increased risk of HIV and AIDS and compromised access to health services because of extreme climatic conditions. Loss of livelihoods that may arise from loss of agricultural land or displacement because of extreme conditions may increase exposure to contracting HIV because of the nature of the new survival livelihoods. Extreme events like floods may disrupt social services, such as, road networks and health facilities; and hence compromise the access of certain group of people to health services.

Coping strategies to minimize impacts of climate change are largely entrenched in adaptations made in response to climate induced changes. Actions necessary to meet the objectives of anticipatory adaptation may be categorized into three classes: primary, secondary and tertiary measures (McMichael and Kovats, 2000b). Primary measures are aimed at preventing the onset of a disease arising from an environmental change in an unaffected population. This may involve distribution of insecticide treated nets to all populations at risk or early warning systems. Secondary measures are preventive activities in response to early evidence of disease impact. Such activities include strengthening of disease surveillance or responding adequately to disease outbreaks. Tertiary measures are actions taken to reduce mortality and morbidity caused by the disease. This may be in the form of timely diagnosis and treatment of malaria cases.

There are, however, some opportunities that African countries must exploit. Some impacts of climate change on health are likely to affect developed countries more than the developing countries. Encroachment of malaria into new zones, for example, is likely to have more impact in populations with no previous exposure to the parasite. Thus developed countries are motivated to ensure that the impacts are minimized. Moreover, there are huge amounts of data in the continent, although not systemically collected, that may be used to make future predictions to institute preventive measures. There are also many funding opportunities for the subject of climate change, such as Global Environmental Facility (GEF) Trust Fund, Special Climate Change Fund (SCCF), Least Developed Countries Fund (LDCF), Kyoto Protocol Climate Adaptation Fund, IDRC funded Climate Change Adaptation in Africa (CCAA) and WaterNet .

The presenter concluded that:

- the impacts of climate change on human health are complex and require a trans-disciplinary approach in dealing with them.
- Vector borne diseases particularly those transmitted by mosquitoes are likely to be influenced much more by climate change.
- Sound strategies for adapting to the impacts of climate change are well-documented with little action on the ground.
- While there are serious challenges that may frustrate the efforts to minimize impacts of climate, there are also many opportunities that should be exploited.

There has to be more than political will among governments if adaptation activities are to be sustained.

3.3.5: Issues Arising from the Presentations in Session II

Comments	Questions	Responses
	<p>Do you [Dr Musonda] try to influence the change of policy? This is where we have a major role to play especially coming from the local communities? This will bring the pressure that is needed for policy change.</p>	<p>We need examples to influence policy. Policies are good and some that have been drawn in Eastern and Southern Africa are brilliant but there are no examples of how they can be properly enforced.</p> <p>The presentation is an example of work that WWF is doing with other partners within the region. WWF has approached the Kenyan Government to create awareness of the on-going water reform project so that they can use it as an example of how information can be collected from the ground.</p> <p>The 2002 Water Act of Kenya says that Water Use Associations need to be formed, but the Act does not specify who is going to do that. So WWF had to go to the grassroots and engage communities on the need to have water use associations and also understand how water is managed. Someone had to start from somewhere so WWF is acting as a change agent. There is need for more change agents not just in international NGOs like WWF but even local community-based organizations and civil society groups from the region.</p>
	<p>Lake Bogoria is a very sensitive lake and the key features, such as the flamingoes were not mentioned in the presentation. How are your activities around the lake affecting the bird life or the fishing activities and what will be the impact on the</p>	

Comments	Questions	Responses
	water level in the lake? Does the study take a comprehensive and combining look at what happens around the lake?	<p>The presentation was only a fraction of what WWF is doing in Lake Bogoria having been there for almost 11 years. Initially WWF focused on its core work that is conserving biological biodiversity for the benefit of mankind. When the project was developed the focus was on the flamingoes, and the area that is protected as a Ramsar Site. Later it was realized that working in isolation of the communities upstream was unwise because they have a big influence on how much water finally arrives [downstream]. So we had to actually include the livelihood component. It is only in the last few years that the livelihood issue has been strengthened within WWF. The pollution levels in Lake Bogoria are not as much in Nakuru or in Naivasha for instance. There have also been changes from engaging with the communities to explain that flamingoes are important and are also part of their traditional system and understanding. WWF has also explained that the water is not just for them but also for the other species as well because we share this earth with other species and they understand these dynamics. So the intervention of actually having the water dams has increased the amount of water flowing into River Wasages and to the lake. Overall, we have realized that engaging with communities is very critical.</p>

Comments	Questions	Responses
<p>In scaling out where one African country can learn from another there is always mistrust. If the innovation is from the developed world, African countries often adopt it without even analyzing it. Experiences have to be scaled out to consider what the community wants, for example, to increase their income base through fishing, recycling water used for washing for irrigation.</p>	<p>Is it possible for the initiative (WWF Lake Bogoria initiative) to be scaled out?</p>	<p>Scaling up is a completely different ball game. Solutions have to come from the communities. The community members have to say what they want and what works for them and then we act as a change agent. WWF has realized that what works for one region may not work in another. However, in the water section reform processing in Eastern Africa, similar issues are now arising. Unfortunately in Uganda for example, they do not have water use associations so this poses a problem. In addition there is also a lack of a framework on how to work with communities, which are quite scattered. The situation is easier in Kenya and Tanzania where WWF works with the community through the water use associations. We try to introduce the same ideas across, for example, we think that the approach that we have in Kenya will work in the Ruaha Region of Tanzania. We try and introduce the idea slowly but we also allow the communities to suggest the solutions. I agree that there should be some sort of scaling up but the recommendations should include lesson-sharing because of the need to know what is happening elsewhere.</p>
	<p>Why is there less action on the ground even though strategies have been identified?</p> <p>Who should champion the implementation of policies?</p>	<p>Currently, there is a big gap between knowledge and policy implementation. Unless we engage in knowledge [information] translation and make sure that what is documented either as policies or research findings/recommendations are actually</p>

Comments	Questions	Responses
	Who should champion the action and facilitate the implementation of the strategies that have been identified?	implemented then we have a problem. Most organizations have strategic plans that reflect these key issues but their operations and implementation of research results is wanting because there is no money allocated for such actions. We need pro-active networks like ATPS to take up such issues. We do not want to reinvent the wheel.

Dr. Mumba concluded the session by calling on the ATPS to scale up its work on innovation systems to regional programmes to facilitate country-to-country learning. One would want another country to learn from Kenya, for instance, but in Africa, it is often preferred to borrow innovations from the West. This, she said, is very annoying and counter productive. African communities would like to build capacity in STI and improve their livelihoods and incomes through indigenous STI.

3.4: Round Table Discussion: Experiences and Evidence from the Field in Africa

The final part in this session was a roundtable discussion, facilitated by Prof. Mytelka. Amongst the key discussants were the ATPS Board members, National Chapter Coordinators, and development partners present, e.g. IDRC represented by Ms. Jean Woo, institutional collaborators, such as the Macaulay Institute, WWF, ICPAC, etc, as well as Members of Parliament present. The session was aimed at scoping potential activities/initiatives for ATPS on climate change, especially to fit into the ATPS Phase VI Strategic Plan (2008-2011). Dr. Urama explained that the ATPS adapted PQRP framework for research planning in the drafting of its Phase VI strategic plan. *“We have heard all the presentations and the good advice of what the ATPS should do,”* he said, *“it is now time for the ATPS Board, national chapter coordinators, development partners and other experts to engage in a round table discussion to identify priority themes for research and policy advocacy and practical interventions under the subject of climate change which ATPS should take forward in the next Strategic Plan, 2008 – 2011”*. *“This, he said, is in fact an important part of the ATPS Phase VI Strategic, 2008 - 2011 planning process”*.

He requested delegates to kindly participate in the round table to draw out two to three thematic or non-thematic interventions the ATPS needs to embark upon under the theme of climate change in its new strategy. For every idea that is raised, the delegates were required to consider a number of practical questions which would serve as a reality check on the feasibility and relevance of the suggested theme: (i) Is it practical and feasible to embark on such a program? (ii) Is it within the ATPS mandate to take this forward? (iii) If so, is it a priority for the ATPS to take this forward in the Phase VI Strategy? (iv) Who are the partners that the ATPS should work with on the program, and finally how would this be taken forward into a new ATPS program? In other words, all suggestions must be discussed critically by the round table to establish how relevant it would be to ATPS making a difference by 2020; why is it a priority now, and with whom can ATPS should take this forward. Where ATPS lacks the capacity, it would collaborate with other institutions. Where the issues are important but not within the ATPS mandate, delegates were required to suggest other research organizations and/or private sector actors who could take that forward. In such cases, the ATPS will, through its knowledge brokerage activities, recommend those agendas to the identified institutions and/or private sector actors.



A cross-section of delegates during the Roundtable Discussions

The facilitator, Prof. Lynn Mytelka, applauded the process and encouraged the delegates to participate proactively, as this was a chance for them to influence the future of the ATPS and its Programs, going forward.

Prof Turner Isoun congratulated ATPS for its achievements during the last decade in science and technology policy making. He emphasized that there are major positive changes going on in Africa and those who ignore them, are doing so at their own peril. He noted that Africa have seen tremendous advances in STI in the past decade due to the useful work of STI institutions, of which the ATPS has remained at the forefront. Six years ago the international community had ignored the potential market in the African continent, but currently Nigeria boasts about 40 million mobile phone subscribers today. In fact the mobile phone companies worldwide have accepted that the greatest potential for growth of wireless technologies is in Africa. He also pointed out the great achievements of the internet technology in Africa, noting that all these could be mobilized for the development of the continent. He encouraged delegates to be unlimited in their thinking and to focus on key interventions that would make the difference. Referring to the quality of the presentations at the meeting, Prof. Isoun acknowledged the improvement in the quality of STI policy research in the continent and commended the ATPS for the good work done so far.

He noted that Africa has produced a critical mass of very brilliant scholars working in Cambridge, NASA, Oxford and many other premier knowledge institutions, and hence can create its own critical mass to mobilize STI for African development. He noted that many people who do not see these changes are constrained by their own mind-sets. "Africa, he said, must not be constrained by the same mind-set, ..., ATPS should no longer remain in its old form." He encouraged delegates to focus on the contemporary challenges facing the continent and be aware of the evolving global challenges, and hence remain dynamic in its strategic plan. "I think it is very important to note that I feel very optimistic today. What

I heard and saw gladdens my heart because I can see and feel progress. I can see quality. This morning, when I talked about Africa evolving its own scientific trajectory, I was not just being poetic. I believe in it and I believe it can be done and we can see the science of achieving it is there. ... I am quite pleased with the present and past leaderships of the ATPS Secretariat and strongly believe that we are set to make the difference in Africa.

Prof. Eric Eboh, Executive Director of the African Institute for Applied Economics (AIAE), stressed the fact that Africa must remain optimistic rather than continue to bemoan poverty and espouse the thinking that Africa is in disarray and unable to make it. Most presentations in other African conferences are often full of scientific results with very few policy actions. There is need for immediate action to reverse this trend. *“I think that the ATPS is in a position to be the arrow head for this action to start influencing the management of resources in Africa. Now, we can do that from the vantage point of research and policy advocacy. I would advise this meeting to strategically select research themes that would make meaning to policy makers and end users. As scientists, we can use our scientific principles and models to come up with results, but in the end, what matters is how far we influence policy. So we must select thematic activities that have direct policy relevance.”*

The recommendations by the round table on what the ATPS should do to make a difference in Africa's ability to adapt to climate change are summarized below:

- Commission a study to document and disseminate evidence on the impacts of climate change on the rural livelihoods and national incomes. Carrying out this study at country levels and engaging all actors such as policy makers, farmer associations, private sector actors, civil societies, etc would bring to the fore, the likely effects on having no adaptation and mitigation policies. ATPS is in a strategic position to carry out such a study through its national chapters and this will certainly influence behavioural change at individual, community, and national scales.
- Engage in collaborative regional Programs in a consortia model to ensure that impacts are up scaled from the country to the pan-African levels. It was noted that many institutions work in isolation and ATPS is in the position to provide the glue factors (a role model) to ensure active networking and collaborations between STI research institutions and universities in Africa. This will help avoid competition for resources and create synergies and complementarities between relevant STI organizations in the continent.
- Embark on a program for building on indigenous technologies, indigenous knowledge, for climate change adaptation in Africa. Lessons could be learned from indigenous technologies elsewhere, such as Asia and South America, but the focus should be on building and enhancing indigenous capacities to adapt. It was recommended that the ATPS should champion knowledge exchange and technology sharing between the North and south under the auspices of new EU Framework programs on STI.

- Embark on a program of building partnerships with local actors at the grassroots: Partnership with local actors in rural communities in the generation and use of knowledge was emphasized. *“The language of a single scientist may not be understood but policy makers, but the language of a community which is important in the electoral voting system, cannot be ignored.”*
- Develop close linkages with key actors and decision makers in Africa, governments, private sector operators, universities, NGOs, to advocate for relevant policy changes and legal structures to enhance climate change adaptation in the continent.
- Develop appropriation strategies and intellectual property rights laws to protect indigenous technologies and genetic resources was identified as a key issue which the ATPS needs to pursue.
- Develop science communication and knowledge management systems to ensure that research results can be communicated to all end-users. It was noted that a lot of scientific publications are held in media that are not user friendly for the majority of Africans: international journal articles, research reports, and web-based communications fora. The ATPS should provide the linkage between research results and innovations for climate adaptation by developing effective mechanisms to take results to the grassroots.
- Embark on a program of foresight exercises in liaison with African countries to produce strategic STI trajectories for climate change adaptation in selected sectors.

Hon. Katende Gordon Sematiko a Member of Parliament from Uganda explained why parliamentarians generally treat research funded by non-government organizations with skepticism. Some, he said, believe the research is driven more by donor interest rather than national interest; a view that has been dispelled by researchers. The Uganda parliament's S&T Committee are trying to find out why many scientific policies do not go through parliament by learning from other parliaments like the UK. The latter gives balanced information unbiased to parliamentarians to enable them to decide objectively. It is important to emphasize more on multidisciplinary research if one wants to reach policymakers. For example, 'hard core' scientists must ensure they have a social scientist in their team early enough in the research cycle to ensure results are 'digestible' to the policymakers and other end-users in general. He commended the efforts by the ATPS to involve MPs, the private sector and researchers in framing the agenda for the ATPS Phase VI Strategic Plan, noting that this makes the research and policy advocacy of the Network African and relevant to the development agendas of the countries of the continent. He stressed the following points which he advised the ATPS to consider in the implementation of its Phase VI strategy:

- Civil society pressure has a bigger advantage in pushing the policy makers/parliamentarians to pass policies because of their engagement with the public opinion. ATPS must engage the civil society appropriately and at the right time during the research process to add pressure to policymakers.

- Policymakers/parliamentarians prefer to pass policies that will bear fruits while they are still in office to claim the success of such initiatives, so ATPS should capitalize on short-term coping strategies that would yield results in the short term rather than long term theorizing and blue sky science.
- ATPS should develop a comprehensive communication strategy to target the different players. He referred to the example of how simple cartoons were able to relay more on the importance of family planning than detailed research papers. ATPS should measure its success from evidence on use of policies at the community level.
- ATPS could also engage with policymaking at global level through collaboration with relevant institutions such as UNEP, UNFCCC, WHO, etc. There are a lot of discussions at the moment on compensated reduction for avoiding deforestation, and efforts to update the Kyoto protocol which finishes in 2012. Even though Africa is not responsible for a lot of the climate change problems, ATPS can be part of the solution in helping to find alternative technologies to store carbon that would otherwise be released into the atmosphere.
- ATPS could also get involved in various global projects within the science community, for example, the Global M project which though the focus has been mainly on the science, there may be a role in weaving how to involve policymakers. There are a number of other projects, such as, the GCAFS project which is looking at global food security and there is also the global carbon project; all trying to engage policy makers at the global level and to link science.
- Policy making varies from country to country and there are several decision making centers that exist in countries that are unknown to people unless they are investigated. ATPS should map the existing policies and institutions that influence policy. It is important to ensure buy-in for any research idea that may influence policy in the long-run and this will expedite the dissemination and diffusion process.

Dr. Urama, Director of ATPS concluded this session and noted that the Secretariat would follow-up with some delegates to develop some of the ideas generated at the meeting into programs for the implementation of the ATPS Phase VI Strategic Plan. He thanked the delegates for the successful round table and the wealth of knowledge that has been gathered through the process to inform the ATPS Phase VI Strategic Plan. He stressed that each ATPS program, be it under the auspices of the “thematic program” or “non-thematic (facilitative) programs”, aim at development of STI-capacity (knowledge basis/infrastructure, knowledge circulation/networks, knowledge conditions/policies); and not on pure STI research as such. This will be taken into consideration in the selection of programs to be taken forward.

He introduced the next sessions which would involve expert group discussions to synthesis the information gathered so far and prioritize these in the light of the felt needs for STI

research, policy and practice in the countries of the ATPS chapters that could be taken forward under the auspices of the ATPS Phase VI strategic plan. He noted that these expert groups would be facilitated by Ms. Pound. Each group would have a member of the ATPS Board and a resource person selected from the ATPS National Coordinators who would guide the discussions to ensure that the recommendations are consistent with the ATPS mandates. Delegates are free to select which group to attend and/or to choose to contribute to more than one group depending on levels of experience and expertise.

4 WORKING GROUP DISCUSSIONS

Session III was devoted to working group discussions. The delegates were divided into four groups based on the 4 questions/themes that were discussed in Session II. Each group had a presentation relevant to their session and a discussion thereafter. Delegates were then expected to share research and initiatives already underway on the particular theme and the gaps that ATPS can address. They were also encouraged to come up with two or three thematic or non-thematic activities that the ATPS Phase VI strategic plan could address.

The four working groups were;

Working Group 1: Climate change, Agriculture and food security

Working Group 2: Climate change, biodiversity loss and fragile ecosystems

Working Group 3: Climate change, water scarcity and environmental sustainability

Working Group 4: Climate change and human health

4.1: Group One - Climate Change, Agriculture and Food Security

The group's discussions were preceded with a presentation by Dr. M. Tibbo on their paper titled '*Livestock-Environment Interactions and Some Technology Options in Crop-Livestock Production System, Ethiopia*' by Nigatu Alemayehu, Markos Tibbo, Mary, M. Masafu, Azage Tegegne & Abule Ebro.

The paper assessed options to intensify livestock production in order to meet the growing human demand for livestock products. Ethiopia has the largest livestock population in Africa. There are two livestock production systems in the country's mid-highland:

1. Mixed crop-livestock production which is the major source of income. Farmers sell part or all of the grain and straw produced on-farm to cover other living expenses. The research topics identified in this production system are: (a) to study the level of land degradation and land use changes and their root causes; (b) assess the current crop-livestock production

systems as it differs from the traditional systems; and (c) evaluate technology options that intensify livestock production in environmentally friendly way.

2. Intensive livestock production that is characterized by animal feeding operation. They import large amounts of animal feed like concentrate, straw, forage and bedding materials. Intensive livestock operations often have inadequate land, so and increased risk of water contamination. The research agenda identified in this sub-production system include manure production and health related problems due to manure disposal, utilization and management.

The climatic and socio-economic changes that occur in many areas have put increased pressure on the natural resources to produce more food and animal feed. The dynamic social and economic changes in urban and rural areas contributed to gradual change of the traditional livestock practices into mixed crop-livestock production system. Technology should be designed to enhance the productivity of mixed crop-livestock systems and markets, and with different cropping patterns and production practices. Improved technologies will involve upgraded varieties of food and feed crops, forages, legumes and tree crops as well as improved genetic stocks of cattle, sheep and goats. This includes better strategies for transferring these technologies and more effective extension services.

It is important to intensify livestock production to meet the growing human demand for livestock products. Farmers should also be encouraged to decrease dependency on grazing and zero graze. Zero grazing enables farmers to manage their animals, ensures efficient use of feed, reduces energy loss of animals due to grazing and improves pasture productivity. The presenter suggested the following issues for implementation:

- i. Mitigate land degradation with potential positive implications for livestock;
- ii. Intensification of livestock development with potential implications for local and national sustainability;
- iii. Change land use in line with socio-economic and climate changes; and
- iv. Recommend practical adaptation technology options and/or policies.

In conclusion, research and development activities should involve farmers, researchers, extension workers, micro-finance organizations, and policy makers. Farmer's adaptation or resistance to technologies should be documented to draw lessons for future planning and action. The knowledge and experience obtained in research will help to provide information to improve decision making in sustainable livestock-environment development equilibrium.

4.1.1 Issues Arising from Group 1 Discussions

The group discussed and identified a number of issues but prioritized the following:

- Disaster management or drought: this includes drought and food management under which they categorized early warning systems, such as weather forecasting, breeding for drought resistance or adapted variety or breeds, mitigation and coping mechanisms and technology for agriculture;
- Assessment of institutions and policies;
- Innovation and awareness which involves knowledge diffusion;
- Human resources capacity strengthening;
- Diversification of livelihoods;
- Value added activities, such as, agric-processing/food processing for local needs, food preservation or processing technologies;
- Land also categorized into use: this involves land tenure or ownership and land management;
- Marketing of supply chains access distribution; and
- Local or international war and conflict for common resources like water; infrastructure, such as, transportation. It also includes energy issues, farm inputs, credits, seeds, agrochemicals, new gender roles in climate change adaptation and finally pests, weed and disease management control measures.

To describe projects or initiatives dealing with the impact of climate change on agriculture and livelihoods derived from a culture in Africa, it is necessary to strengthen the resilience of African agricultural systems to respond to the phenomenon. These changes also require policies on diversification of livelihoods, ability to anticipate crisis, the development of possible options and the mechanisms for discussing these solutions and achieve results. The first project would require research on the possible impacts of drought and floods in arid areas and wetlands; and develop policies and programs to mitigate the impacts.

The delegates stressed that ATPS is well placed to link the identified institutions and parliamentary committees dealing with agriculture and crisis. They also identified the Institute for Climate Prediction and Analysis (ICPAC), the International Livestock Research Institute (ILRI) and the Ministries of Agriculture as the relevant institutions to undertake such initiatives.

The second project would involve a review existing policies and their effectiveness in weather forecasting. The group singled out meteorological authorities, universities, ministries of agriculture and the United Nations Educational, Scientific and Cultural Organization (UNESCO) as relevant institutions to take up the task. The first step would be to identify the relevant policies and develop criteria for reviewing them. The ATPS Secretariat and the national chapters were designated to take up this responsibility.

The third project recommended was to identify STI capacity gaps and build the human capacity to deal with climate change. This project could be divided into two with the second part involving research on community access and utilization of information on climate early warning system.

The final project suggested by group 1 was research on indigenous knowledge applications to climate change.

After further deliberations, the group decided that the ATPS should build a program around a broad theme: *The Strengthening of Resilience in African Agricultural Systems through STI Capacity Building and Knowledge Brokerage*.

4.2: Group Two - Climate Change, Biodiversity Loss and Fragile Ecosystems

The introductory presentation in this group was by H. Gideon on her paper '*Impacts of Climate Change on Biodiversity Loss and Fragile Ecosystems in Tanzania*'. She introduced biodiversity as the variety in living forms including all plants, animals, microorganisms and the ecosystems. The ecosystem was described as a community of plants, animals, and micro-organisms that are linked by energy and nutrient flows. Such communities interact with each other and with the physical environment.

Biodiversity is important because it offers:

- supporting services including soil formulation, nutrient cycling and primary productivity;
- regulating services that include regulating air quality, climate, floods, soil erosion, water purification, waste treatment and biological control;
- providing services, such as food, fuel wood, fibre and bio-chemicals; and
- providing cultural services, such as heritage, spiritual and religious and aesthetic values.

Climate change is the variation in either the mean state of the climate or in its variability, persisting for an extended period, typically decades or longer. It encompasses temperature increases ("global warming"), sea-level rises, changes in precipitation patterns, and increased frequencies of extreme weather events.

The past decade has been marked by dramatic changes in Tanzania including changes in precipitation (drought (2005-2006), floods (floods of 15 May 2006 in Kilimanjaro) and a drop in water levels of Lake Victoria, Lake Tanganyika, Lake Manyara and Lake Jipe. Moreover, there has been the intrusion of sea water into fresh water wells along the coast and the inundation of Maziwe Island in Pangani There has also been the dramatic recession of Lake Rukwa over time and the disappearing glacier on Mount Kilimanjaro.

Other incidences of climate change on biodiversity happened during the 1997-98 El Niño rains when Lake Manyara was flooded with fresh water. Millions of flamingos were forced to fly away having lost the blue-green algae that can grow only in water with a high concentration of mineral salts. Wildebeests and other animal species died of hunger and thirst during the severe droughts of 2005-2006. Some of the 380 bird species for which Lake Manyara National Park is renowned are seasonal. It is predicted that changes in climate and Lake Manyara's hydrological conditions may alter both migration pattern and breeding of birds and other wildlife that depend on the lake.

Mangroves and coral reefs, the main coastal ecosystems in Africa, are also likely to be affected by climate change. Endangered species associated with these ecosystems, including manatees and marine turtles, could also be at risk, along with migratory birds. Many species that are already vulnerable are likely to become extinct especially those with limited climatic range, geographical opportunities, habitat requirements and small population. Many ecosystems will be dominated by opportunistic species, such as weeds due to changes in the frequency, intensity, extent, and locations of climatically and non-climatically induced disturbances. The livelihoods of many indigenous and local communities will be affected. Conservation of biodiversity and maintenance of ecosystem structure and function are important climate change adaptation strategies because genetically-diverse populations and species-rich ecosystems have greater potential to adapt to climate change.

The presenter suggested some mitigation and adaptive measures which include a reduction of other pressures on biodiversity arising from habitat conversion, over-harvesting, pollution, and alien species invasions. Other measures are re-vegetation activities that increase plant cover on eroded, severely degraded, or otherwise disturbed lands. This has a high potential to increase carbon sequestration and enhance biodiversity. In addition, bio-energy plantations can potentially substitute fossil fuel energy with biomass fuels. However, this may have adverse impact on biodiversity if they replace ecosystems with higher biodiversity.

Currently, baseline data to measure the impacts of climate change on biodiversity are inadequate. For example:

- i) **Amphibians (frogs, toads and salamanders):** - the first taxonomic group to have been completely assessed. The results of the Global Amphibian Assessment (GAA), released in 2004 to widespread media coverage were alarming. One in three amphibians face extinction.
- ii) **Mammals:** Although a great deal is known about mammalian biology, systematics, distribution patterns, and conservation status, this knowledge is neither uniform nor complete. Moreover, of the more than 5,000 known mammal species, the threat status is inadequately documented. The GMA's aim is to consolidate available information for each species on systematics, distribution, habitat

- requirements, ecology, life history, conservation status, past and existing threats, conservation actions, and population trends.
- iii) **Marine Species:** The Global Marine Species Assessment which began in 2005 will be the first global review of the conservation status of every marine vertebrate species and of selected invertebrates and plants.
 - iv) **Plants:** Less than 3% of the world's known plant species have been assessed so far.

This calls for more research to identify and map biodiversity at national, regional and global scale. Environmental impact assessments and strategic environmental assessments can be integrated into the design of climate change mitigation and adaptation projects and policies. The assessments will assist planners, decision-makers and all stakeholders to identify and mitigate potentially harmful environmental and social impacts and enhance the likelihood of positive benefits, such as carbon storage, biodiversity conservation and improved livelihoods.

Issues Arising from Group Two Discussions

The group compiled the ideas that were generated during the plenary session and merged the common ones, making additions where necessary.

The group agreed on three potential projects for ATPS to consider, these are:

- Building Africa's STI capacity to cope with the impact of drought on ecosystems and livelihoods.
- Developing Strategic National Innovation Systems Framework for sustainable natural resource exploitation to ensure equitable resource access, benefit sharing and use of indigenous knowledge systems.
- Explorative study on the impact of climate change on land use and land cover.

Drought is as an important issue with regard to climate change and the project on the *Impact of Drought on Ecosystems* would be timely if well executed. ATPS should liaise with African institutions, e.g. Universities, international NGOs, inter-governmental organizations and expert groups such as the African Society for Ecological Economics (ASEE), NEPADS, the Inter Governmental Authority on Development (IGAD), ILRI, IWMI, etc. The first stage would be to conduct a baseline survey to map the STI capacity (knowledge base knowledge circulation, infrastructure, institutions, etc). A pan-African stakeholder forum should be held to discuss and brainstorm on the topic before delving into detailed research. In general, the ATPS Secretariat and national chapters are best placed to implement the task with potential partners drawn from national government, local universities and the Private Sector Actors. The structure of the stakeholder policy forum could be disaggregated to different levels: local, national, regional, and pan-African following the ATPS networking structure.

Under this theme of ‘Climate Change, Biodiversity Loss and Fragile Ecosystems’, access, benefit sharing and indigenous knowledge systems are important. Therefore, the second project on *Developing Strategic National Innovation Systems Framework for sustainable natural resource exploitation to ensure equitable resource access, benefit sharing and use of indigenous knowledge systems* would be useful. While the ATPS should lead this initiative, it is important to engage all the actors in the triple helix to ensure a holistic approach to the study.

Finally, Explorative study on the impact of climate change on land use and land cover should be exploratory to provide a policy tool for mapping the potential impacts of climate change on land use and land cover in Africa. Such a tool will be very useful in policy simulations and scenario analyses of potential impacts on agriculture which is the mainstay of the African economy. The ATPS Secretariat could liaise with relevant international organizations to take this forward.

4.3: Group Three - Climate Change, Water Scarcity and Environmental Sustainability

This group meeting began with presentation from Prof. E. Eboh on ‘*Resource Degradation, Poverty and Growth in Nigeria: Implications for Climate-Change Adaptation*’. He said that sub-Saharan Africa (SSA) countries are likely to suffer most from the negative impacts of climate change, due to substantial economic role of climate-dependent sectors such as agriculture, forestry and fisheries, and also due to limited financial, institutional and human capacity to anticipate and respond adequately to the direct and indirect effects of climate change (IPCC, 2001b).

Dr Eboh reviewed the state of renewable resources that the agricultural sector in Nigeria relies. It is evident that lack of coordinated action to promote sustainable management of renewable natural resources will aggravate risks of the country to the impact of climate change. Estimates show that close to 80 million Nigerians live below the poverty line. Most of the poor are in agriculture and renewable natural resources sectors. These depend on climate for productivity improvements, etc. Climate change, therefore, is an additional threat to existing risks and places increased strains on livelihoods.

Across the world, climate change is eliciting two dimensions of policy responses, mitigation and adaptation. Adaptation can be anticipatory (that is, *ex ante*) or reactive (that is, *ex post*)¹. The key challenge for SSA countries is to enhance adaptive capacity and thereby minimize the risks from climate change impacts.

¹ Poverty and Climate Change: Reducing the Vulnerability of the Poor through Adaptation. African Development Bank and other international agencies, 2003.

Countries are increasingly dependent upon knowledge systems, rather than on natural resource based static comparative advantage. Generating and using knowledge for economic growth requires strong Science and Technology capabilities and linkages. The presenter argued that unless SSA countries adopt policies to accelerate technological learning and innovation systems approaches in agriculture, they will face worsening prospects from incapacity to adapt to climate-change impacts. Agricultural productivity in SSA is highly dependent on local soil, climatic and ecological conditions. A more effective strategy is to build endogenous agricultural research and development capacity to undertake inventive adaptation. Building strong and dynamic STI base does not stop at establishing scientific centers, research institutes and universities. It requires making S&T an integral component of the development strategy in relation to country-level priorities for technological change. The Presenter noted that the ATPS is the only established pan-African knowledge network that can fully boast of championing STI capacity building as part of the integrated development agenda. Addressing the climate change impacts in agriculture requires significant improvements in the agricultural research and extension system through STI knowledge systems. The ATPS therefore has the responsibility to mainstream STI in both agricultural research and extension for adaptation to impacts of climate change in future.

Using the example of Nigeria, the presenter proposed to improve its capacity to adapt to climate-change impacts, the government of Nigeria must promote technological learning and entrepreneurial experimentation in agriculture, towards market oriented, technology based and resource efficient farming. Improving agricultural research and agricultural education requires substantial leaps in public and private investments. Incidentally, many countries in SSA already have limited resources in relation to the huge investment requirements for developing infrastructure, health and education and other social systems. More innovative approaches to resource mobilization from within and outside the countries are therefore called for.

There is also need to conduct national climate impacts, adaptation and vulnerability assessments to improve understanding of the potential implications of climate change for poverty reduction and sustainable development. Adaptation to impacts of climate change can only be sustainable if addressed within the framework of economic growth, poverty reduction and sustainable development policies of the country. In Nigeria, the NEEDS-2 provides the framework by which climate change issues can be mainstreamed, in order to promote both anticipatory and reactive adaptation. Therefore, climate change adaptation policies and strategies need to be considered as integral component of economic growth strategy under the NEEDS-2 and 7-point agenda of the federal government.

4.3.1 Issues Arising from Group Three Discussions

The group divided the topic on *Climate Change, Water Scarcity and Environmental Sustainability* into four themes: water resources management; waste water and pollution; stakeholder capacity building; and innovation.

i) *Water resources management*: The first initiative under this theme would be to generate STI indicators for community vulnerability and adaptability. ATPS could collaborate with the United Nations Environment Program (UNEP) and climate change institutions on this. Drafting a concept note would be the first step and then a workshop with the relevant institutions. The second step would entail a policy analysis on water resources management to identify if there are any conflicts within policies in the country or if there is a shared water cause. Possible partner institutions are the Water research Institute (WRI), the Southern African Development Community (SADC), WATERNET, the Kenya Institute for Public Policy Research and Analysis (KIPPRA), the International Water Management Institute (IWMI), global water partnerships, National Water Commissions and relevant government institutions.

ii) *Waste water and pollution*: The project under this theme would be grassroots level adaptation through recycling, re-use and water harvesting technologies to address water scarcity arising from climate change. ATPS could work with WATERAID, Water and Sanitation Development (IWSD), non-governmental organizations (NGOs) and local authorities in this initiative. The first step would be to conduct on-desk research on current technologies and best practice. The study would also identify lessons from countries that are implementing these technologies. This would be followed by stakeholder workshops but the final step would ideally take the form of case studies.

iii) *Stakeholder Capacity Building*: This would simply involve how to build the capacities of relevant communities and institutions. Communities have adaptation measures to water scarcity and climate change, these needs to be documented and shared. This indigenous knowledge may have helped these communities to adapt. ATPS could work with Community Based Organizations (CBOs) and NGOs on this. The second stage in capacity building could involve ATPS training government institutions on the new technologies for adapting to climate change, for example, using remote sensing. UNEP and government institutions were identified as key institutions that can work with ATPS.

iv) *Innovation*: This will involve assessing innovation technologies on climate change, research and dissemination to address water catchment degradation. Water catchments will degrade as a result of climate change. Key institutions that can work with ATPS in this area are UNEP, the International Food Policy Research Institute (IFPRI) and IWMI. The first step would be to prepare a concept note, hold workshops and then conduct case studies.

4.4: Group Four - Climate Change and its Effect on Health

Emile Guei gave the introductory presentation in group four on '*Impacts of Climate Change on Human Health and Adaptation in the Waste Disposal Sector in Côte d'Ivoire: Example of Methane Channeling at the Akouédo (Abidjan) Public Dump*'. The presenter focused on the generalities in climate change and the mechanism for clean development and the impacts of climate change on human health. The case study was on the adaptation in the waste disposal sector in Côte d'Ivoire using the example of methane channeling at the Akouédo (Abidjan) public dump. The EOULEE Group in Cote d'Ivoire conducted this study.

The EOULEE Group was established in 1992 to conduct applied research in the waste management sector in Côte d'Ivoire. In 1997, the EOULEE Group was appointed the agent of the Ivorian State for the rehabilitation and collection of biogas from the Akouédo (Abidjan) dump to produce electricity. Since 2005, the group has developed a training program on optimal collection and the evaluation of municipality waste in Abidjan. They use the approach of the Mechanism for Clean Development, from the Kyoto protocol in the framework of the United Nations convention on Climate Change.

The EOULEE Group were first to initiate the Mechanism for Clean Development projects in Côte d'Ivoire. Cote d'Ivoire compares poorly in this area to emerging countries like Brazil, India and China. The initiatives must aid the following:

- sustainable development in Africa;
- fight against climate change; and
- support to policy makers to take into consideration measures of adaptation to climate change in the elaboration of development programs in Côte d'Ivoire.

4.4.1 Issues Arising from Group 4 Discussions

The group suggested four initiatives to deal with the theme on 'Climate Change and its Effects on Health', these are:

- A Baseline study on climate change impacts on health in Africa.
- STI capacity building initiatives for monitoring climate change and its effects on health.
- Support innovations and technological interventions that mitigate the effects of climate change on health.

Therefore, the first suggestion was to commission a baseline study on climate change and health in Africa for the Network to scope what is happening on the ground and where the STI gaps are. The institutions that could take lead in this are ATPS national chapters and the Secretariat.

The second project would involve developing STI capacity for monitoring climate change and its effects on health. This would include collating up to date information on early warning on climatic change in relation to health. The first step in this project would be to assess existing STI capacity and relevant monitoring indicators. ATPS, national chapters and the private sector are relevant institutions for this initiative.

The third project would address supporting innovations and technological interventions that mitigate the effect of climate change on health. The first step in this would be to map the health innovation systems and appropriate technological interventions at the country levels. These innovations systems actors, institutions and technologies should be relevant to climate change and its impact on health. To undertake this project would require a research proposal development workshop for the delegates to develop projects that could be supported by ATPS and other organizations.

After the four working group sessions, the group chairs were asked to nominate panel discussants to prioritize the themes/projects that came out of the group discussions. The selection was to be based on the delegates knowledge of the subject, the mission and vision of ATPS; and the capacity to deliver. The table below summarizes the deliberations.

Suggestions of Initiatives to be Pursued	Discussions/ Recommendations	Agreed Project Title
Group One		
<ul style="list-style-type: none"> • Regarding the impact of climate change, agriculture and food security in Africa, there is need to strengthen the resilience in African agricultural systems to respond to these changes through STI. There should be a mechanism to discuss this with potential stakeholders. • The STI content of current policies on weather forecasting in each country should be reviewed. The issue to be addressed here is how effective are these policies in meeting the challenges of climate change as relates to agriculture. The outcomes of those gaps can be used for policy changes or sensitizing policy makers. • The third issue is to identify gaps in human, institutional capacity and mount programs to build STI capacity to respond to climate change. • The significance of Indigenous Knowledge (IK) cannot be understated. It is important to analyze access of information on climate and early warning systems among the user communities. There should also be research in articulating the IK and its application to climate change in Africa. 	<ul style="list-style-type: none"> • What we strongly recommending here is that each country should have a stakeholder roundtable dialogue to look at the issue of STI capacity to respond to climate change effects on agriculture. Then they can identify the policy gaps that ATPS might pick on as issues for policy advocacy and future roundtables. 	<ul style="list-style-type: none"> • The broad theme selected is <i>The Strengthening of Resilience in African Agricultural Systems through STI Capacity Building</i>. This large program should contain the six themes of the ATPS Phase VI Plan.

Suggestions of Initiatives to be Pursued	Discussions/ Recommendations	Agreed Project Title
Group Two		
<ul style="list-style-type: none"> • The first project focused on building capacity to adapt to <i>Impacts of climate change (Flooding and Drought) on ecosystems and livelihoods</i>. • The second project area is on access benefit sharing and IK systems broadly. • The third project focused on <i>Impact of Climate Change on Land Use and Land Cover</i>. 	<ul style="list-style-type: none"> • The issue of drought can be addressed under this including looking at the innovation systems or technologies for addressing drought in areas where ecosystems and species are threatened. • Another approach would be to look at issues related to eco-agriculture as one of the innovative ways of ensuring that the effect of climate change and agricultural production is taking place within agricultural landscapes. The research component of this program can be designed to address what innovation systems are needed to ensure sustainable production in farms while conserving biodiversity. 	Possible title for the program area is “ <i>Innovation Systems for Mitigating Impact of Climate Change on Ecosystems</i> .”
Group Three		
<ul style="list-style-type: none"> • There is a need to assess the climate vulnerability of river basins to design adaptation technologies. Identification of the hot spots will be a useful advocacy tool as well. • It is important to generate indicators for sustainable adaptation options. • The STI content of existing policies needs to be reviewed to see those that can be improved. • Specific issues that requires urgent attention includes, 	This should build on the ATPS Water and Environment Program findings across the continent. The ATPS Water and Environment Team should take the discussion forward.	There should be one big Program under water resources management that could incorporate all the others. A suggested topic is: “Innovation systems and integrated management of water resources in Africa”.

Suggestions of Initiatives to be Pursued	Discussions/ Recommendations	Agreed Project Title
innovative techniques for waste water management in urban slums, industrial waste treatment technologies, and water harvesting techniques..		
Group Four		
<ul style="list-style-type: none"> • The first project was to commission a literature review on climate change and its effect on health. • The second project was to develop the capacity for monitoring climate change and its effect on health. • The third is to support health innovation and technological interventions that mitigate the effect of climate change on health. • This was not a project <i>per se</i> but whether ATPS can train delegates to develop good research to solicit for funding not only from ATPS but also from other donors. 	<p>This should build on the ATPS health technology program which is ongoing. It is possible to constitute a smaller team from the group or even an e-group and continue the discussions. From this a concept note can be developed based on the ongoing health innovations systems mapping case studies that are ongoing in five countries.</p>	

5: CLOSURE OF CONFERENCE AND WORKSHOP

The 2007 ATPS conference and workshop was officially closed with remarks from the ATPS Board members and the ATPS Director.

Dr Urama thanked everyone for a productive two days of deliberations. He confirmed that the issues on programs and ideas that had been discussed would be analysed and the draft results from the emergent analysis disseminated to all delegates. He was pleased with the four broad themes of program areas that ATPS may develop into concept notes and hopefully into full programs with the help of the group members and relevant experts. Members of the individual teams were asked to register with the chairpersons of their groups so that they could form e-groups to discuss these issues further. He emphasized that ATPS was not looking for research projects per se but for programs that would generate STI knowledge where none exists, in addition to the task of advocacy, communication of science and linkage with policy makers to ensure that the knowledge generated is translated into policy. Referring to the mission and vision of the ATPS, he drew a clear distinction between basic R&D and the building of Africa's STI capacity to cope with climate change. He emphasized that the ATPS was not wishing to replicate the good science that is already ongoing in relevant research institutions, but rather seeks to find gaps in Africa's STI capacity to cope with climate change. The development of STI-capacity (knowledge basis/infrastructure, knowledge circulation/networks, and knowledge conditions/policies) must therefore remain the focus of all ATPS Phase VI programs; and not on pure STI research as such.

He stressed that the problem facing the continent today is no longer the dearth of good science, but the fact that most of the science produced today are locked up in text books, journal articles, etc without adequate translation of the knowledge to practical and sustainable adaptation policies and/or practices. Bridging the gaps between the available knowledge in the different knowledge communities (i.e. orthodox science, and indigenous knowledge), and between these and evidence based policies and innovations for development remains at the centre of the ATPS strategic objectives for the Phase VI plan. The ATPS is therefore interested in programs that will help it achieve this goal: "building Africa's STI capacity to cope with climate change". Science projects under the program must therefore be designed to support the facilitative roles of the ATPS in this area.

5.1: Remarks from the Board Members

Prof Turner Isoun

“The new strategic plan is no longer just a program from the secretariat but one owned by the whole Network and will become an ATPS agenda” said Prof Isoun, former Minister of Science and Technology, Nigeria. He added that it was refreshingly different from previous ones because the whole Network had participated in evolving the new strategic plan through a year long iterative dialogue at all levels. He noted that while this approach has been arduous and different, a program plan that all ATPS members could own have evolved. The plan, he noted, has also provided a unique vehicle for member states to input their own STI policy and research needs for the plan period, hence making its programs very much demand driven and policy relevant. He asked ATPS to resist from responding to donors priorities without due consultations and proper analyses of Africa’s needs and contexts. This he noted would lead to failure. On this note, Prof. Isoun applauded the painstaking participatory approach of developing the ATPS Strategic Plan and expressed great optimism that it would make a difference in building Africa’s STI capacity in the coming decade. Regarding the specific conference on climate change, he noted that it is very timely, well planned and well administered. He expressed optimism and confidence in the suggested themes on climate change adaptation and the matrix and the programs that emerged from the participatory sessions. This will no doubt be successful as they respond to Africa’s needs as identified by Policy makers, Private Sector and the Academia. He encouraged delegates to continue with the process in the development of other programs under the remaining thematic areas to be addressed by the plan.

Prof Lynn Mytelka

Prof Mytelka said that it was nice and different to have many political personalities and policy makers from the various countries among the delegates. They were important because they contributed to the diverse discussions on new and different technologies and innovations. Therefore, they would act as ‘translators’ during the policy making process.

To make sure that ideas work locally, it is important to strengthen STI policy research capacities in Africa. There is need to use local research and researchers to address local factors and conditions and build evidence-based ideas for innovation instead of simply importing ideas from elsewhere. She further noted that building on indigenous knowledge (IK) is very important and should feature more prominently in the future implementation programs. The ATPS must avoid borrowing ideas and technologies from the North and these are not necessarily the best models for development. She said that Africa has continued to pursue the modes of production that have already proven to be rather disastrous in the North, such as large scale farming with high energy costs and massive uses of fertilizers. She stressed that the ATPS Phase VI Plan should address this illusory followership which is found in other research networks in Africa. She also noted developing

intellectual property regimes for appropriating the rents from Africa's natural resources and indigenous knowledge is an important aspect that should be pursued. The process of developing the plan, she said, has been very refreshing and encouraging.

Prof Sam Wangwe

Prof Wangwe noted that the workshop had presented an opportunity to have in-depth discussion over the various aspects of a topic that was contemporary and under discussion in the global circles, i.e. climate change.

He congratulated ATPS on the quality of resource persons from within and without the Network for bringing out real issues from the grassroots. He said that the participatory exercise had dealt with the theme in depth while making contributions to influence the future work of the Network. ATPS should continue demonstrating its multi-disciplinary nature by ensuring that the knowledge gathered from various disciplines was given a realistic approach. This approach should be broader and demonstrate the power of inter-disciplinary approach to science and technology policy.

In conclusion, he noted that the discussion of theme had shown researchers the importance of considering beneficiaries as they conduct their research. It was not all about publishing the work in scholarly journals but researchers should also aim at impacting policy makers and understanding the policy process.

Finally after the remarks from the three Board members, Prof Olembo appreciated the South African Chapter National Coordinator, Dr Rubin Pillay, and the South African Chapter for hosting the conference and workshop, despite being the newest chapter in the Network. She thanked the Network members and stakeholders for the fruitful meeting and expressed delight for the new phase of the ATPS. She was delighted at the participatory sessions, re-echoing the words of Prof. Isoun that this was refreshingly different. She noted that ATPS can now move forward into the final stages of the development of the Phase VI Strategic Plan, confident that all stakeholders have been involved in shaping the plan. This, she noted, would ease the implementation of the plan and also ensure that it remains relevant to the STI policy needs of the continent.

5.2: Vote of Thanks

Dr Kevin Urama thanked all the delegates and the development partners from Macaulay, IDRC and the Royal Dutch Government for taking the time to participate in the conference and workshop. He also thanked the ATPS South Africa Chapter, University of Western Cape and the University of Cape Town for supporting the conference and workshop in Johannesburg, South Africa. He also thanked the ATPS secretariat for their commitment towards a successful meeting. The resource persons were also recognized. The Members of Parliament for Uganda and Malawi received special thanks. Finally, special mention was given to Dr Osita Ogbu, the former Director of ATPS, for honoring the invitation and

contributing to the future planning of ATPS. Dr. Urama noted that the ATPS is a product of the hard work of Dr. Osita Ogbu, his staff, the National Chapters and the ATPS Board, and the support received from development partners. He called for renewed commitment by all parties to build on the gains already achieved by the Network.

Regarding the participation and outcomes of the conference, he noted that he was very pleased. Africa, he said, has a great potential to make its fortune and grow its economies through responsible STI for climate change adaptation. The carbon markets, demand for bio-fuels, and alternative energy sources are growing phenomenally and the trend is predicted to continue. Africa holds the comparative advantage in natural resource endowments with potentials to become a global leader in the field of climate change adaptation technologies. If we do not act now, we run the risk of losing out completely. He hoped that this will not be the case and encouraged delegates to continue the dialogue to raise awareness on the need to act now.

He noted that the participatory process would continue as the national chapter coordinators and the Board of ATPS retire to consider the emerging outputs of the process and implications for the Phase VI Strategic Plan. He noted that draft Strategic Plan will be updated based on the outputs from the deliberations which were being processed concurrently, the outputs from the ATPS national chapter coordinators meeting /SWOT analyses and the final comments from the ATPS Board and presented to the ATPS AGM for final review and adoption.

6: ATPS ANNUAL GENERAL MEETING, 2007

The AGM was chaired by Prof Norah Olembo, the Chair of the ATPS Board. She thanked the membership for the active participation in the conference and workshop activities and stressed that as is the tradition of the ATPS, the annual conference and workshop is concluded by an annual general meeting. She noted that the AGM is the formal meeting of the membership of the ATPS where issues regarding the Network and its chapters, any problems encountered during the year, and plans for the future are discussed. She also noted that the meeting presents a platform for the membership to receive information from ATPS partners and chapters, and discuss any other matters of interest to the ATPS to agree a way forward. She summarized AGM as a platform where “we seat together and review what we have done and plan a way forward”. She therefore called on the membership to bring forward any ideas on how to strengthen the Network and suggestions on changes that many be necessary to improve the work of the ATPS.

She declared the meeting formally open and called for adoption of the draft agenda. The agenda included update from the 13th Board meeting, presentation of the outputs and capacity building/policy outcomes ATPS ICT program by the coordinator, Prof Melvin Ayogu; and Presentation of the draft ATPS Phase VI Strategic Plan, 2008 – 2011 by Dr. Urama, Director of ATPS, review of the year 2007, chapter performance award ceremony, and matters arising from the floor, and selection of the host for the 2008 annual conference and workshops.

Prof. Olembo gave opening remarks at the general meeting, commending the Network for its performance in 2007. *“I just want to mention that for me, this has been one of those very successful annual conference and workshop, from the point of view of strategy and variety of topics the were discussed, the quality of key note speeches, and the facilitation of the meetings”, she said.*

Dr. Urama called for additions and/or comments on the agenda and there being no comments or an addition, the agenda was unanimously adopted by the AGM.

6.1: Final Technical Report on ATPS ICT Governance Project:

“Strengthening ICT Policy in Africa: Governance, Equity and Institutional issues” by

Prof Melvin Ayogu, Dean, Faculty of Commerce, University of Cape Town, South Africa

Prof Melvin Ayogu, the Program Coordinator of the ATPS ICT Governance Program presented the final technical report to the AGM. He noted that he was invited to present the capacity building impacts of the project by the ATPS Director as it was important to members to review and appreciate project outcomes even after the scientific outputs have been delivered.

He noted that the project was initiated by a concept paper prepared at the ATPS Annual Conference in 2001. The paper provided the framework for a research agenda on the governance and equity issues around Information and Communication Technology (ICT) in Africa. This led to a pre-study workshop to brainstorm on country specific topics, overarching themes, and methodological issues.

He noted that the Program had two main goals: (i) to strengthen the capacity for ICT policymaking and implementation, and (ii). To enhance widespread and affordable access to ICTS, growth in local access infrastructure.

To achieve effective trans-disciplinarily and regional networking, the project teams included a mixture of scientists from the academia from both the physical and social science backgrounds, and private and public sector operators. The regional representation of the project teams were informed by a number of criteria:

- regional representation (East, West, North and Southern Africa);
- countries at various stages of ICT policy formulation;
- countries with various per capita income levels; and
- Internet density, public access ISP, and stages in public sector reform process.

Dr. Ayogu noted that the study covered 12 countries and the three main linguistic regions of Africa: Francophone, Anglophone and Lusophone.: Collaborators for the Program were therefore selected from Morocco, Senegal, Ghana, Nigeria, Ethiopia, Rwanda, Kenya, Uganda, Tanzania, Zambia, Zimbabwe, South Africa, and Mozambique. He noted that coordinating the Program which was funded by Ford Foundation, IDRC, World Bank infoDev, the Royal Dutch Government, and the OPEC fund, changed the way he conducts his research and evaluates research outputs.

He noted that he was trained in Economics but the multi-disciplinary partnership occasioned by the ATPS ICT project soon made him realize that he needed to integrate STI policy issues in his research and policy advocacy. The project was implemented by seven Resource Persons and 31 Researchers/Practitioners with diverse professional training and backgrounds. He noted the in addition to the scientific reports/outputs, the

delegates of the project have also gained much in terms of capacity building as many of the researchers have subsequently taken up leadership roles in ICT related ministries and in the private sectors of their countries. He noted that some of the program participants are now Chief Executives of leading ICT outfits in their home countries, adding that such an outcome outweighs scientific publications. Prof. Ayogu noted that the outputs from the project are in final stages of editing for publication in a special issue of the refereed journal *Telecommunications Policy*².

Issues Arising from Prof Ayogu’s Presentation

Comments	Questions	Responses
Dr. Aredo (Ethiopia), applauded the outcome of the project, noting that he was one of the Program delegates. He wondered when the journal article would be ready in print so that the good work of the team can be disseminated.		Prof: Ayogu noted that the technical report for the project is already available at the ATPS Secretariat. However, the completing of the editorial duty for the special issue journal article is taking more time due to the associated challenges of editing a journal publication.
Prof. Chimbari wondered if there was any examples of actual policy impacts of the project in addition to effects building ICT capacity of the project team	Dr. Urama called for further comments or updates on the policy impacts of the Programme.	Mr. Aduda (Kenya) responded that basically, this was the only report of its kind that dealt with governance issues of ICT. It was actually used by the Kenya Information Society to influence the changes that have taken place within the Communication Commission of Kenya (CCK). Prof. Isoun, (former Minister for S&T in Nigeria), said that one of the project beneficiaries acted as the Director General of the Nigerian Information Technology Development Agency. Prof. Issun noted there has been a lot of development in terms of capacity, connectivity, etc.

² A leading journal in Telecommunications infrastructure policy published by Elsevier Science Publications.

6.2: ATPS Strategic Plan Presentation

Dr Urama presented the draft strategic plan. He explained that the Phase VI Strategic Plan provides a framework for guiding the activities of the African Technology Policy Studies Network (ATPS) over the period 2008-2011.

He explained that the zero draft plan was developed based on horizon scanning of the development challenges and the STI policy research arena in Africa, concept notes submitted by the national coordinators which identified key country level STI policy gaps in member states, outcomes of the SWOT analyses carried out at the regional Secretariat level in June 2007, and comments from the Network's resource persons, the Board members and other stakeholders who represents ATP's milieu. He noted that the zero draft of the plan was presented to ATPS Board in June 2007 and in November 2007, and that he has already received some review comments from ATPS partners. He added that the preliminary outcomes of the 2007 annual conference and the SWOT analyses carried out by the ATPS national chapter coordinators, and comments received from the 13th ATPS Board meeting have also been taken into account in the current zero draft Plan. The Plan, he said, "has evolved a great deal and will continue to evolve on the basis of more detailed analyses of inputs from the conference and the AGM."

The presentation, he said, provides an "opportunity to look at the key issues that may still be missing in the emergent analyses carried out to synthesis the contributions from the membership and stakeholders so far. He therefore encouraged members to make their comments, adding that the ATPS expects to conclude the participatory process at the AGM as the ATPS Phase V Plan is scheduled to end on 31 December 2007. He acknowledged all the national chapter coordinators who had taken time off their busy schedules to hold consultative meetings at the national level and submit key issues, research questions and the policy areas for ATPS to focus on in the future. He also thanked all those that continued to provide reviews of the document as it evolved.

ATPS, he said, strongly believes in effective demand driven STI policy research and practice, knowledge circulation and knowledge brokerage in Africa. In setting the strategic objectives and priorities for Phase VI, ATPS has therefore taken a participatory approach recognizing the importance of the "strategic planning process" for ownership, buy-in and effective program implementation for achieving the desired policy impacts. He stressed that the zero draft plan builds on the achievements and strengths of the network and critical analyses of the experiences and gaps identified in Phase V, 2004 – 2007. It seeks to address Africa's unique development challenges especially within the context of achieving specific social, economic and environmental development targets by 2015. As in previous plans, ATPS will continue to close the loop through outreach, knowledge brokerage and policy advocacy.

Subsequently, the new motto, revised vision and mission of the ATPS were presented for adoption by members:

Motto: “*Science and Technology Policy Research Today for Sustainable Development Tomorrow*”

Vision: “*To become the leading international centre of excellence and reference in science, technology and innovation systems research, training and capacity building, communication and sensitization, knowledge brokerage, policy advocacy and outreach in Africa*”.

Mission: “*To improve the quality of science, technology and innovation (STI) systems research and policy making in sub-Saharan Africa by strengthening capacity for science and technology (S&T) knowledge generation, communication and dissemination, use and mastery for sustainable development in Africa*”.

He further explained that the Phase VI Strategic Plan aims to improve the understanding and functioning of science, technology and innovation (STI) processes and systems to strengthen the learning capacity, social responses, and governance of S&T for addressing Africa’s development challenges, with a specific focus on the MDGs. Taking into consideration the achievements of the ATPS Phase V and ongoing activities in 2008, ATPS Phase VI will pay specific attention to a set of specific strategic goals identified in liaison with the ATPS national chapters and policy stakeholders. These include to:

- 1) Strengthen institutional and individual capacity to carry out and use cutting edge research in inter-related STI processes and systems and their implications for achieving the millennium development goals (MDGs) in Africa;
- 2) Facilitate and strengthen regional and international cooperation and partnerships on related STI research and policy issues to assist access to research environments and knowledge communities in other continents;
- 3) Support and strengthen the innovative capacity of youth and women to apply STI to relevant development policy issues in Africa;
- 4) Strengthen endogenous technical capacities to produce, use and govern sustainable technologies for achieving the MDGs in Africa;
- 5) Facilitate and support knowledge sharing on STI amongst key stakeholders for sustainable development in Africa; and
- 6) Promote the integration of S&T research and policy in African development planning and policy making processes.

These strategic goals generate three thematic and three cross-cutting strategic priorities and programs for the ATPS Phase VI. The thematic programs include:

1. Research and research capacity building,
2. International cooperation and partnership, and
3. Youth and gender empowerment.

On the other hand, the crosscutting programs include:

4. Training and sensitization,
5. Science communication and stakeholder dialogue, and
6. Outreach, knowledge brokerage and policy advocacy, respectively.

These programs are inter-twined and together with monitoring and evaluation, form the strategic framework for the Phase VI Strategic Plan. These programme priorities are elaborated in section four of this plan.

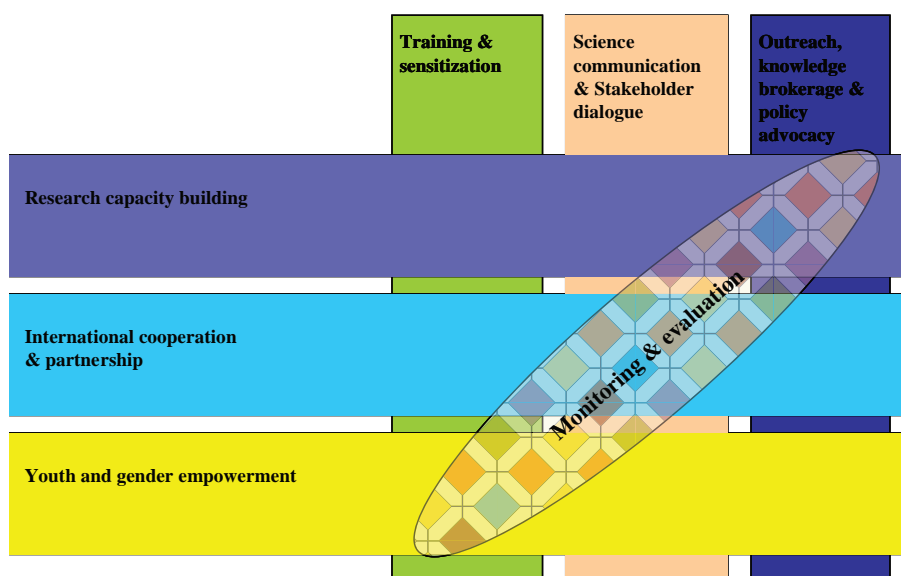


Figure 1: Strategic Framework for ATPS Phase VI showing the Strategic Priorities

Dr. Urama went further to describe each of the specific goals and objectives of the thematic and cross-cutting programmes.

6.2.1: Research and Research Capacity Building

The overall strategic objective of the research program is to support cutting-edge multi-disciplinary research and research capacity building projects to enhance individual and institutional capacity to generate and use new STI policy-related knowledge for addressing the MDGs in Africa. Specific attention will be paid to research that examines the impacts and relevance of indigenous and emerging science, technologies and innovations (STI) systems on achieving the MDGs in Africa.

The specific priorities of the research capacity building program includes to:

- 1) Identify and pursue thematic research into contemporary and inter-related STI policy issues of importance to achieving the MDGs in Africa;
- 2) Commission and facilitate targeted small grants research to respond to STI systems-related issues of relevance to national interests within the context of the MDGs;
- 3) Identify and award thesis grants for research capacity building in STI-related subjects targeting the MDGs in African universities and polytechnics;
- 4) Award thesis supervision grants to promote the development of quality STI education in Africa; and
- 5) Organize and implement research methodology training workshops on STI systems related subjects to enhance capacity to deliver high quality research outputs by Network members.

Under this program, ATPS continues to pursue selective research into contemporary STI policy issues that address cross-cutting questions of importance to development in the region. The essence of this type of thematic research is to seek results that can be applied widely to solve problems in the region, share country experiences, foster networking among researchers, and provide quality advice based on robust results. ATPS will continue to engage with relevant stakeholders in identifying and prioritizing specific research and policy questions to be addressed in each member country. Specific attention will be paid to all the stages of the research project cycle, including the scoping, planning, implementation and continuous evaluation to ensure adequate risk minimization and timely delivery of target outputs and policy outcomes. Each of the thematic research programs will include the three cross-cutting strategic priorities: targeted training and sensitization activities, public participation and evidence-based stakeholder dialogue, knowledge brokerage and policy advocacy. All ethical issues in contemporary STI policy research including youth and gender empowerment issues will also be taken into account. To ensure effective research capacity building, the ATPS small research grants scheme and research methodology training workshops will be an integral part of each thematic research program. This approach will ensure a targeted and effective response to specific STI policy research issues at local grassroots levels, continued capacity building for young researchers and network members³, enhanced cohesion and social responsibility in the ATPS national chapters and cost-effectiveness in research implementation and delivery. The focus and scale of each thematic research program will be informed by its strategic objectives and targeted policy outcomes.

³ The composition of the research teams for the small grants projects will be designed to encourage young researchers to learn from senior colleagues and international experts throughout the research and peer review process.

Expected outcomes

By 2011, ATPS expects to have:

- 1) Provided opportunities for African researchers to engage in high-quality peer reviewed research on STI related subjects relevant to achieving the MDGs in Africa;
- 2) Built individual and institutional capacity to generate and use STI for addressing the MDGs in Africa; and
- 3) Enhanced better understanding of STI research and policy processes in Africa.

6.2.2: International Cooperation and Partnership

The strategic goal of this program is to enable African universities, research institutions, STI associated ministries, firms and individual experts to establish contact with their counterparts in other countries, thereby facilitating access to other *knowledge communities* internationally. ATPS believes that this will promote *scientific excellence* and development of necessary *innovative skills* for the production of knowledge, technologies and innovations for development in Africa. It is now widely accepted that the international competitiveness of modern economies is linked increasingly to their ability to generate, adapt and use new knowledge. Science, technology and innovation systems (STI) are considered to be key factors contributing to achieving sustainable development, prosperity and economic growth. International cooperation in STI sharing has also proved instrumental in enhancing and enriching many other policy areas with an impact on external relations: trade, development, environment, energy, telecommunications, etc in many developing economies.

The ATPS Phase VI program on international cooperation and knowledge sharing will be a vital instrument for establishing and reinforcing platforms for co-operation amongst existing knowledge communities on bilateral, inter-regional, and international scales. Specific program initiatives will include developing, adapting and using new knowledge to address the MDGs in Africa while promoting Africa's indigenous knowledge and technologies for use elsewhere.

Ongoing STI dialogues and networks will be further enhanced locally and regionally to identify and establish priority areas of research and policy for specific development challenges to the continent, for example, sustainable energy options, sustainable management of water, biodiversity, forest ecosystems and livelihoods, and the role ICTs, biotechnology and bio-ethics, nanotechnology and non-ethics, intellectual property rights and other appropriation strategies, etc in meeting the MDGs in Africa based on lessons elsewhere. These partnership forums will promote regional integration and strengthen the coordination of STI cooperation and complementarities with activities carried out by other knowledge communities and policy instruments. Coherence between national activities on STI will also be enhanced by supporting the coordination of national programs and through multi-lateral coordination of national STI research and policy activities.

Priorities for STI cooperation with other countries and regions will be based on participatory dialogue in recognition of their specific socio-cultural and ecological conditions, research capacities and lessons from previous programs. Specific attention will be given to helping less experienced countries to rapidly acquire the necessary knowledge and technologies accumulated in Africa and in other countries of the developing world.

Specific priority will be given to strengthening dialogue between African regions to encourage public and private sector partnerships taking into account the larger framework of external relations and cooperation programs and policies.

The specific priorities of the international cooperation and partnership program include to:

- Promote thematic international cooperation actions in STI policy decision making for addressing the MDGs, based on mutual interests and benefits;
- Facilitate and support participatory dialogue amongst relevant policy makers, scientific community, civil society, private sector stakeholders and developments partners (donors, relevant ministries, etc), to identify and prioritize STI cooperation policies of mutual interest;
- Promote and strengthen the participation of targeted African countries, especially in the Francophone and Lusophone regions, in shaping STI policy research and policy agenda for Africa;
- Promote Africa's competitiveness through strategic public-private sector partnerships on selected STI issues by engaging international experts in ATPS' research programs and through strategic collaborative partnerships with like-minded institutions and private sector enterprises in Europe, Asia and America; and
- ATPS annual conferences: Thematic annual conferences will be employed to take forward emerging issues and/or review ongoing work.

It is expected that these platforms for dialogue will be designed to promote regional integration and the identification and prioritization of common research areas of mutual interest to African countries, facilitate the uptake and use of common identified research outcomes, technologies and innovations for addressing the MDGs in Africa, inform future thematic research by ATPS and like-minded organization in Africa⁴. This will also create effective bi-lateral partnerships amongst African STI institutions, government ministries, and civil society and with like-minded organizations globally.

⁴ Helping Africa to set the research and policy agenda for achieving the MDGs in the next decade on the one hand, and helping international agencies and Donors prioritize funding support to targeted needs of the continent.

6.2.3: Youth and Gender Empowerment

This program will have two strands of activities designed to mobilize youths and women to build their capacities in STI research and policy decision-making thereby empowering them to contribute positively to efforts to achieve the MDGs in sub-Saharan Africa. Two program priorities have been identified:

6.2.3.1 African Youth Forum in Science & Technology (AYFST)

Since 2005, ATPS has embarked on an African Youth Forum in Science and Technology (AYFST) program with the key objectives of creating awareness and sensitizing African youths; capacity building; peer education and mentoring; information sharing and inclusion, and empowerment of the African youth in the area of STI research and policy decision making processes.

Over 230 African youths from 21 African countries have benefited from three regional youth congresses held in Kenya, Ghana and Uganda in 2005, 2006 and 2007 respectively. The congresses focused on youth employment and youth leadership in HIV/AIDS prevention; addressing food insecurity and health for sustainable development in Africa, and more recently, the role of youths in achieving the MDGs in Africa. These programs have been very successful in creating awareness and sustaining interest amongst African youths in STI research and policy related issues in Africa, empowering the youth to participate actively in STI research, local interventions and social entrepreneurship programs. The continued engagement and dialogue among the youths is enhanced through the AYFST Website <http://www.ayfst.org>.

The specific strategic priorities of the Phase VI youth program are to:

- Mobilize the youth and empower them to harness STI for development in Africa;
- Support and facilitate regional knowledge sharing and cooperation among African youth;
- Facilitate and promote youth engagement in agriculture, science and technology, and social entrepreneurship programs in their countries,
- Facilitate STI career mentoring for African youths by their senior colleagues in Africa and in Diaspora;
- Provide targeted research training and capacity building especially in agriculture, STI research and practice to address the declining expertise and growing disinterest in the sector; and
- Promote youth involvement in ATPS research and other MDG related STI projects elsewhere.

Expected Outcomes:

The AYSFT program is expected to achieve the following outcomes by 2011.

- 1) Enhanced skills/capacities in agriculture, STI research and policy advocacy;
- 2) Improved skills in STI research and project management and implementation practices among African youths;
- 3) Increased youth participation in STI research projects and other innovative and productive interventions at local, regional and national levels;
- 4) Increased internships at various STI related research institutions and non-governmental organizations in Africa and elsewhere;
- 5) A functioning networking platform; forum [online and offline] in which the youth can exchange views and opinions; and
- 6) Increased awareness among the youth on inter-related policy issues in agriculture, science and technology and the need for multi-disciplinary approaches in STI research and policy making.

6.2.3.2 African Women in Science and Technology Forum (AWSTF)

The aim of the AWSTF is to provide a vehicle through which African women can express their ideas, contribute their expertise and participate in policy and decision-making processes in Africa. The program objectives and expected outcomes of the AWSTF mirror those of the AYFST.

6.2.4: Training and Sensitization

The broad objective of this strategic priority is to strengthen local STI capacity in Africa. In order for developing countries to progress in scientific and technological development there is need to build local capacity that can help solve the many science and technology-related problems they currently face. Training and sensitization is a cross-cutting priority within the Phase VI Strategic Plan. It forms an integral part of each of the strategic priority described above.

Universities in Africa are potentially a powerful vehicle for development. However, they are also often underutilized for this purpose. The university curriculum is often not relevant to practical development issues in their host countries because of the pressure to compete and publish internationally. ATPS will continue to encourage universities to work with industry and government to accelerate local and national technical capacity development.

The specific priorities include:

- 1) Reviewing engineering curriculum to mitigate the mismatch between what is taught in polytechnics and skills requirements in the labor market;
- 2) Identifying and awarding small grants to STI institutions including universities to promote the integration of STI policy into their curriculum;

- 3) Organizing stakeholder and parliamentary round-tables and participatory dialogue to enhance evidence based policy making in the region;
- 4) Organizing STI training for policymakers, parliamentarians and entrepreneurs to bridge the knowledge gap and build constituencies for STI policy making, particularly in relevant government ministries and with other agents of change;
- 5) Organizing training of journalists, researchers, policymakers and artists to create a pool of resource persons for evidence-based popularization of STI research and policy in Africa; and
- 6) Continuing to support science and innovation parks.

6.2.5: Science Communication and Stakeholder Dialogue

The importance of science and technology (S&T) to modern societies, and the role of a technologically informed population in promoting social and economic development have been recognized over decades.

There are several reasons why a focus on S&T to benefit the poor in Africa with ATPS Phase VI Strategy is appropriate and timely. Despite recent positive and rising per capita growth in sub-Saharan Africa (SSA), the absolute number of poor people is still rising and is projected to rise to 336 million by 2015 (World Bank, 2006). By 2015, over 90% of the poor are expected to live in either South Asia or Africa. Secondly, S&T is the most important and readily available means to empower the poor. However, S&T culture is yet to be mainstreamed at the community level in SSA, thus limiting the awareness and ability of the region's growing poor populations to recognize and apply basic scientific techniques to their daily chores, and therefore restricting their chances for innovation, growth and prosperity.

S&T policy studies in ATPS have been a vital source of knowledge and information for new strategies that can achieve visible improvement in SSA. Local and external scholars have carried out several S&T policy studies, but the extent to which policy makers and the general public have adopted the study findings and recommendations to aid development is not certain. Practical ways of communicating science through multi-media in order to transform knowledge to actual innovations for development is, therefore, becoming increasingly important.

The ATPS Phase VI strategy will, therefore, build the Network's experience in this area to close the science-policy gaps through innovative science communication strategies. This strategy will prioritize the following:

- 1) Building partnership with the mass media to promote evidence-based science reporting;
- 2) Providing and facilitating networking opportunities for S&T journalists, researchers and policy makers through joint workshops and policy forums;
- 3) Producing multi-media publications and disseminating ATPS research outputs

in user friendly formats, newspaper articles, news features, and other artistic impressions such as cartoons, etc; and

- 4) Facilitating continued publication of high quality scientific research in international journals and other ATPS publication series;

Expected Outputs:

- 1) Designing and producing a media kit;
- 2) Organizing capacity building workshops for journalists and editors;
- 3) Organizing media award schemes to promote individual journalists and media houses that promote the reporting of STI activities;
- 4) Organizing write shops for journalists, researchers and artists to reduce relevant publication on STI policy;
- 5) Organizing regional policy forums for all stakeholders;
- 6) Convening round-table discussions for policy makers and researchers
- 7) Organizing STI week to show the public the relevance of STI in their daily chores;
- 8) STI policy prize for professional scientists and communication professionals who have conducted excellent innovative projects to present STI to the public; and
- 9) Building regional and national networks/associations for STI journalists.

Expected Outcomes

- 1) Better appreciation of STI policy research by science Journalists, Policy Makers and artists;
- 2) Newspaper articles (news/feature stories) for publishing;
- 3) Science story books and cartoons for primary schools; and
- 4) ATPS Technopolicy briefs derived from the research findings.

6.2.6: Outreach, Knowledge Brokerage and Policy Advocacy

The strategic goal under this program is to promote integration of STI research and policy in African development planning and policymaking processes. The following activities will be prioritized:

- 1) Expansion of national chapters to all SSA countries by 2015;
- 2) Continued support to parliamentary round-tables and other forms of stakeholder and policy dialogue, including policy fora, e-forum on STI and participatory community dialogue on relevant policy issues;
- 3) Continued support for regional research programs, regional training and research methodology workshops;
- 4) Continued support to national chapters to organize science revival days to mainstream STI research and policy issues in public debates;
- 5) Mainstreaming STI research and policy making in Africa by building linkages with government ministries, parliamentarians, etc., and encouraging involvement of network members in STI policy debates in Africa.

Expected Outcomes

- 1) Strengthened partnerships between researchers and policy makers in the STI policy process;
- 2) Opportunities for different policy stakeholders to brainstorm on the options for accelerating the achievements of a country's STI objectives;
- 3) Sensitized leaders/policy makers on their leadership roles in promoting STI-led development;
- 4) Stronger existing ATPS chapter through training, establishment of offices, etc;
- 5) Establishment of a minimum of five new ATPS chapters focusing on Francophone and/or Lusophone African countries; and
- 6) Minimum of eight policy briefs addressing MDG-related STI policy issues published.

Dr. Urama went ahead to present a draft strategy for the implementation of the ATPS Phase VI Strategic Plan for comments by the AGM. The strategy which involved detailed plans for thematic and non-thematic (facilitative) program activities is summarised in Figure 2

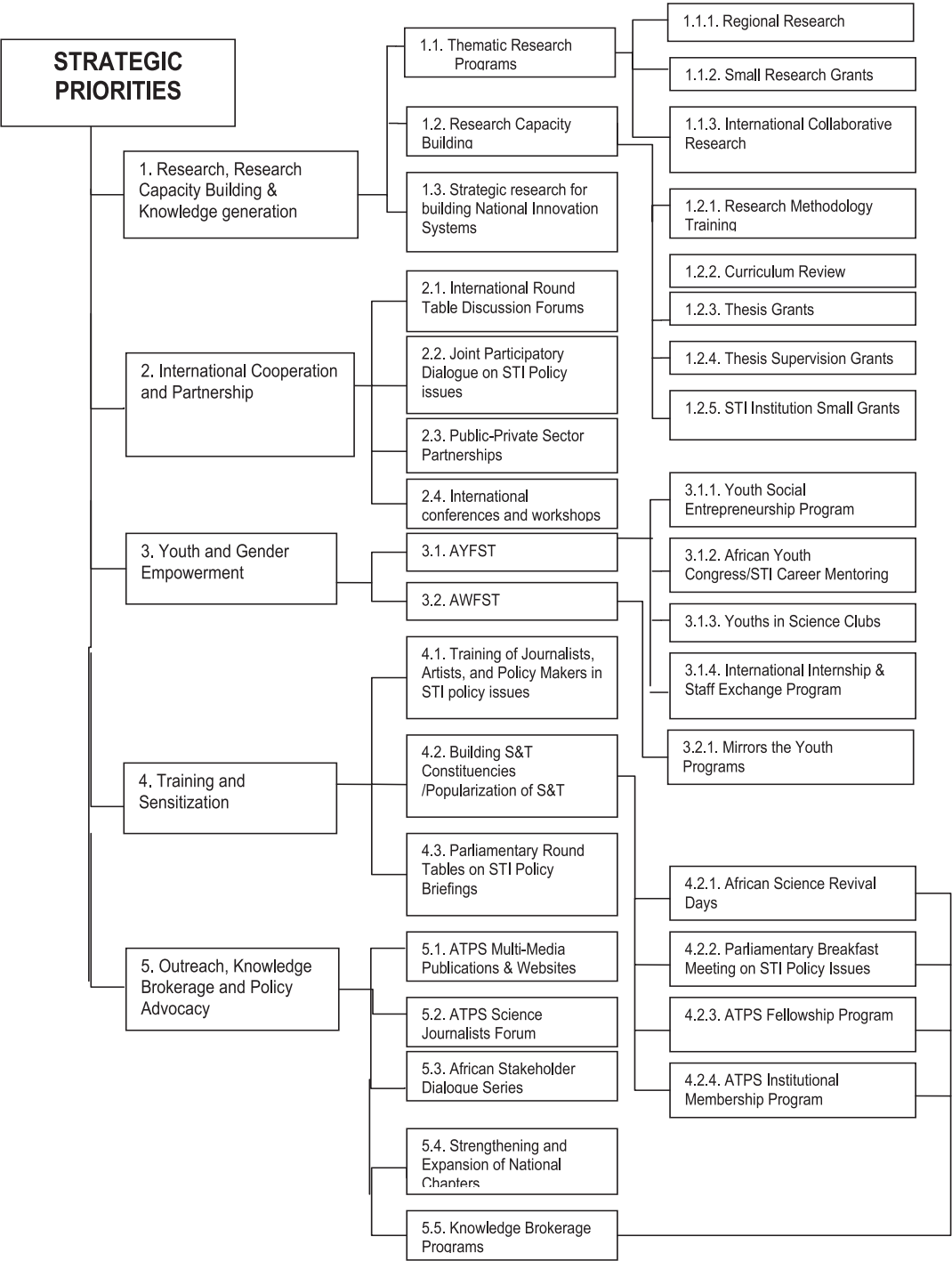


Figure 2: ATPS Phase VI strategic priorities

Dr. Urama concluded his presentation of the ATPS Phase VI Strategic Plan, 2008 – 2011 by presenting the organizational frameworks for the ATPS and the Secretariat, both of which he said, have been approved by the ATPS board. The new structure responds to the implementation needs of the ATPS Phase VI Strategic Plan and aims to enhance a more participatory, less hierarchical Network management structure. He reminded the AGM that the presentation of the plan at the meeting marks the final stage of the participatory process of developing the plan. He therefore called on the membership to make final comments on the strategic plan and reminded them that the plan would be updated and circulated to the national chapter coordinators for final comments before it will be returned to the Board for final approval. He noted that the plan is scheduled to be concluded by mid-December 2007 so that it can be made available to potential donors as the ATPS Phase V plan, ends on 31 December 2007. It was therefore necessary to commence the Phase VI Plan in January 2008.

Issues Arising from Dr. Urama's Presentation of the Zero Draft Phase VI Strategic

Comments	Questions	Responses
Participant: I have one small clarification request. It regards the International Collaboration Program where you mentioned external institutional collaborations. From experience, a number of African government officials tend to look at outside interventions (e.g. the biotechnology Program in Kenya), as an American agenda and they do not seem to like that. This is an area you may want to review carefully to avoid such feelings.		Dr. Urama noted the comment and promised that it will be taken into consideration in the revision process. He noted that in the globalizing knowledge community, it was not advisable to completely ignore existing wealth of knowledge held in relevant institutions in the North and/or in other regions such as Asia, Australia, etc. The program is designed to foster collaboration rather than competition amongst STI institutions in Africa in the first instance, and then liaise with other knowledge communities outside Africa to respond to development challenges both at the local, national, regional and global levels. Some challenges such as climate change is global in nature and a global perspective is important.

Comments	Questions	Responses
	<p>Prof. Thali (Lesotho) and Benson (Zimbabwe) wondered how the outcomes of the ATPS national coordinator’s SWOT analyses would be integrated in the plan since it is already drafted to this stage?</p>	<p>Referring to the slide where he described the participatory process of developing the plan, Dr. Urama reminded the meeting that the presentation is based on a zero draft produced on the basis of concept notes submitted by the national chapters and subsequent iterations with the Board, SWOT analyses at the Secretarial level, and comments from the national chapters and other Resource Persons who responded to calls for concept notes and comments by the Secretariat. He noted that he was updating the zero draft strategic plan on the basis of the outcomes of the 2007 conference. He also assured the AGM that the outcomes of the national chapter’s SWOT analyses and all comments received from the membership will be taken into account in the final plan. It was however necessary to present the zero draft plan to the general assembly for final review comments as this was the last opportunity for the general assembly to meet before the commencement of the Phase VI Plan in January 2008. He assured the meeting that the outputs the national coordinator’s SWOT analyses and the updated Strategic Plan will also be circulated to all the national chapters for final comments and adoption before the plan is finalized. He encouraged members to liaise with their national chapters to ensure that their comments are</p>

Comments	Questions	Responses
		transmitted to the Secretariat in time for these to be addressed in the final plan. He stressed the need to respond in time as time was of essence.
<p>Ms. Pound expounded on Dr. Dube's question, noting that during the SWOT analyses, the national Coordinators had identified the strengths of the Network that needs building on, and also weaknesses that needs urgent attention. The two that came out as top priority were issues around strengthening the chapters and funding for chapters.</p>	<p>Dr. Dube (Swaziland) – clarified that the questions by Dr. Thali and Benson Zwizwai regards some urgent actions which were identified in the national chapter SWOT analyses which needs to be implemented. He wondered if these actions will still be included in the final strategic plan.</p>	<p>Dr Urama explained that these issues had already been identified by the Secretariat SWOT analyses carried out in June 2007, the report or which has been circulated to chapter coordinators. He referred again to the strategic priorities of the Plan which specifically discussed the issue of strengthening and expansion of the national chapters. He noted again that the presentation is only a zero draft plan based on contributions received so far. He reminded the assembly that all chapters were invited to submit concept notes in March/April 2008 and the issues presented in the zero draft plan are based on submission received from the chapters as well as from other stakeholders. All chapters will receive the updated plan for final review. He called for members to review this section and forward comments on how best this strategic goal can be best achieved in the new plan.</p>

There being no further questions, Prof. Olembo recorded her delight in the stage the strategic planning process had reached, noting that it has been a long and drawn out participatory process. She enjoined members to continue to engage in the process as the zero draft plan is being finalized in the coming weeks.

Dr. Urama thanked members for their comments and confirmed that the ATPS Secretariat will liaise with the national chapters to finalize the plan in the coming weeks. He requested the national chapter coordinators to kindly respond in time as the plan needs to be completed by mid-December to avoid keeping development partners waiting and/or delayed implementation. “We need to make sure that in January 2008, we have a Strategic Plan and funding to be able to continue with activities...” He encouraged national chapters to remain active in making contributions and using the knowledge networking resources provided by the ATPS such as the national coordinator’s e-fora, mailing lists, and discussion boards on the ATPS website, etc. He commended the national chapters who have been actively participating in these activities, especially those who carried out their national scale consultations to provide concept notes and inputs into the strategic planning process when the call for concept notes was issued by the Secretariat in March/April 2007. He noted that the participatory process of developing the plan has been drawn out, involving all national chapters, the AYPST, the ATPS Board and also international resource persons, policymakers and ATPS development partners. He stressed that what remained was to build in the outputs from the annual conference, the SWOT analyses by the Chapters and all the comments that were received during the AGM. He stressed that the final Strategic Plan will have to be reviewed and adopted by all the chapters and the ATPS Board before it can be made available to development partners.

He also encouraged members who have been identified to take forward the development of concept notes on the thematic Programs on climate change identified during the meeting, to liaise with the Secretariat to ensure effective follow up activities.

6.3 ATPS Membership database

Dr. Urama reminded the national chapters of the need to update the central database of ATPS membership. He called on national coordinators to kindly submit an update of ATPS members at their respective chapters to the Secretariat as per the request sent to the national chapters before the meeting.

6.4 The ATPS 2007 Conference and Workshop

It was agreed that Senegal would host the 2008 ATPS conference and workshop. The Secretariat would liaise with the Senegal National Chapter Coordinator to make final recommendations to the 14th ATPS Board.

6.5 ATPS Award Ceremony

At the 2007 ATPS annual general meeting, it was unanimously agreed that the ATPS Chapter Performance Awards be postponed to 2008 as the “Market Place Display” of chapter activities and STI policy impacts during the year was replaced by the national Chapters’ SWOT analyses.

6.6 Update on the ATPS 13th Board meeting

Prof. Olembo, Chair of the ATPS Board, provided an update on the highlights of the 13th ATPS Board meeting held on 21 November 2007. She announced that, after due deliberations and evaluation of the performance of the ATPS Director, Dr. Kevin Urama, the 13th ATPS Board unanimously decided to confirm his appointment as the Executive Director of ATPS effective from 21 November 2007. She noted that the board was unanimous in recognizing Dr. Urama’s hard work and the renewed efforts to take the Network forward since he assumed office in September 2007. She specifically applauded the efforts to strengthen ATPS presence through north-south and south-south institutional collaborations. She reckoned that this was crucial to ensuring that ATPS will continue to play its role as a knowledge broker, effectively in the globalizing world. She requested all network members to support Dr. Urama, the Secretariat and the national chapter coordinators as they seek to take ATPS forward in its new strategic Phase, 2008 – 2011. She also encouraged delegates to continue to make their contributions to the building of the Network.

She also announced that the Board had appointed two new Board members: Prof. Brian Heap and Mr. Akossi Bendjo and noted that details will be provided by the Secretariat.

6.7 Closing Remarks

Prof. Olembo, the Chair of the ATPS Board, gave the closing remarks. She acknowledged the presence and support of ATPS development partners, IDRC, the Royal Dutch Government for actively participating in the conference, workshops and the AGM. She specifically paid tributes to Mr. Jeroen Rijniers, the Senior Policy Officer of the Royal Dutch Government’s Cultural Co-operation, Education and Research Department, for staying through all the activities at the conference and workshops. She noted that the ATPS relationship with the Royal Dutch Government has been very fruitful and hoped that this will continue. She also acknowledged Ms. Jean Woo, who participated in the first few days of the conference. Next to receive applause from Prof. Olembo were the international collaborators including Dr. Robin Matthews of the Macaulay Institute, and other keynote speakers who had given excellent presentations at the conference, and the distinguished members of Parliament in attendance. She thanked all the ATPS membership and stakeholders for accepting the invitation to the AGM and participating actively in the meeting. She concluded by noting that she has spoken on the behalf of the ATPS Board members present as there was need to spare time for the closing dinner. She summed up her gratitude to all in the following words: “we have been very impressed

with the presentations and I think we have really seen a way forward in our work from the deliberations during the last three days...With that I say thank you and Goodbye”.

There being no further matters for discussion, Dr. Urama invited Prof. Obua to give a final vote of thanks on the behalf of the AGM. He invited the meeting to the conference closing dinner organized in honour of the services of the former ATPS Executive Director, Dr. Osita Ogbu, and other longstanding/outgoing national chapter coordinators: Prof. Matsella, Prof. Aredo, and Dr. George Essegby.

6.7.1 Vote of Thanks

The vote of thanks was given by Prof. Obua, ATPS Uganda national chapter coordinator. He aligned himself with the vote of thanks already given at the conference closing session by the ATPS Board members and Director of ATPS. “What I am going to do is simply re-echo those individuals and institutions in their various capacities that have been acknowledged for their contributions that led to the success of the 2007 annual conference and workshop”. He thanked the ATPS Board, Secretariat staff and the development partners for supporting the conference, and the various Resource persons who carried out various tasks during the conference and workshops. He also thanked Dr. Rubin Pillay, ATPS South Africa national coordinator and the South African Government for welcoming the ATPS to South Africa, noting that the South African chapter has done a good job in hosting the conference.

Annex 1: NATIONAL COORDINATORS MEETING AND SWOT ANALYSIS

The ATPS National Coordinators' meeting took place on 21 November 2007 in *King Shaka*, Birchwood Hotel and Conference Centre, Johannesburg, South Africa.

Dr Kevin Urama, the ATPS Executive Director, chaired the meeting. Ms Lily Aduke, the Communications and Outreach Manager, ATPS, also attended the meeting and acted as the rapporteur. In addition, national coordinators from 14 national chapters were also present. The minutes of the meeting is held in the national coordinator's files.

The highlights of the meeting include the national coordinators SWOT analyses facilitated by Ms. Diana Pound of Dialogue Matters, UK.

Dr. Urama, who convened the SWOT analyses, described the goals and objectives of the exercise to the national chapter coordinators. He noted that it was organized as a follow-up to the SWOT analyses of the operations of the ATPS Secretariat, carried out as part of the participatory process for developing the ATPS Phase VI Strategic Plan. He encouraged the national chapter coordinators to be frank and objective in identifying the strengths, weaknesses, opportunities and threats/challenges to the Network from their perspective as national chapter heads. He noted that the national chapters form the hub of the ATPS. Even though the development challenges and policy priorities of the national chapters who responded to the ATPS request for concept notes had been taken into account in the draft ATPS Phase VI strategic plan, there may be operational issues regarding the performance of the national chapters which should be taken into account in the final Phase VI Strategic Plan, 2008 – 2011. He therefore encouraged the chapter heads to be objective in the exercise, noting that he will not be present during the exercise. The Facilitator is a Professional in the field and would therefore treat all contributions in confidence. Dr. Urama noted that the contributions will be analyzed through emergent analyses and the results will be built into the ATPS Phase VI Strategic Plan. After this introduction, and attending to some other matters arising from the floor, Dr. Urama handed over the facilitation of the SWOT analyses exercise to Ms. Pound.

The report of the national coordinator's SWOT analyses submitted to the ATPS by Dialogue Matters, UK be made available on request.

**Annex 2: ATPS ANNUAL CONFERENCE AND WORKSHOP:
 A PHOTO STORY**



Participants select groups of expertise for the privatization exercise



Participants engage in a brainstorming session for visioning what the ATPS could do to make a difference in building Africa's capacity to adapt to climate change



Outcomes from Group 1: Climate change, food security and African agriculture; Group 2: Climate change, biodiversity loss and fragile ecosystems; Group 3: Climate change, water scarcity and environmental sustainability; and Group 4: Climate change and human health



Ms Diana Pound, Facilitator, Dialogue Matters, UK outlines procedurals for expert group meetings



Expert group on Climate change and human health prioritise programmes for ATPS Phase VI



Expert group on Climate change, biodiversity loss and fragile ecosystems (from second left, Dr Mumba Musonda, WWF; Prof Turner Isoun, Nigeria; and extreme left Ms Jean Woo, IDRC) prioritise programmes for ATPS Phase VI



Expert group on Climate change, water scarcity and environmental sustainability, prioritise programmes for ATPS Phase VI



Expert group on Climate change, food security and African agriculture prioritise programmes for ATPS Phase VI



A development partner, Ms Jean Woo, Programme Officer, Innovation Policy and Science, IDRC examines thematic priority outcomes



Ms Pound, Facilitator, sorts outcomes of the deliberative process

Annex 3: CONFERENCE AND WORKSHOP PROGRAMME

Monday, 19 November 2007

Venue: KINGSHAKA

Opening Session

Chair: Prof. Chris Tapscott, Dean, Faculty of Economic Management Sciences, University of Western Cape, South Africa

08:30 - 09:30 Welcome remarks from Dr. Rubin Pillay, *National Coordinator, ATPS South Africa*
Brief remarks from:
Dr. Kevin Urama, *Director, ATPS*
Dr Osita Ogbu, *former Executive Director, ATPS and Former Economic Adviser to The President and Chief Executive, National Planning Commission, Federal Republic of Nigeria.*
Dr. Jeroen Rijniers, *The Royal Dutch Government Representative*
Ms. Jean Woo, *IDRC Representative*
Prof. Turner Isoun, *Former Minister for Science and Technology, Federal Republic of Nigeria and Member, ATPS Board*
Prof. Norah Olembo, *Chair, ATPS Board and Former IDRC Governor.*

09:30 - 10:00 **Opening Key Note Address:** - *Climate Change and Land Use Change: Implications for African Development, by Dr. Robin Matthews, The Macaulay Institute, UK*

10:00 - 10:30 TEA/COFFEE BREAK and PHOTO SESSION

Session I – Role of Science and Technology in Climate Adaptation in Africa

Chair: Prof Lynn Mytelka, Member, ATPS Board / Eng Lourino Chemane, National Coordinator, ATPS Mozambique

10:30 - 11:00 Presentation 1 – Impacts of a Changing Climate in Africa and Strategies for Adaptation and Mitigation by *Dr. Gilbert Ouma, IGAD Climate Prediction and Application Centre (ICPAC), Nairobi, Kenya*

11:00 - 11:30 Presentation 2 - Changement Climatique - Impacts Sur Les Ressources en Eau et la Production Agricole en Afrique De L'ouest et du Centre : Le cas du

Cameroun et de la Cote d'Ivoire par *Prof. Gabriel Tchatat, African Network for Climate Community, Cameroon*

- 11:30 - 12:00 Presentation 3 - How to Use Innovative Financing Mechanisms to Mitigate Climate Change Induced Natural Disasters in Africa by *Prof Femi Olokesusi, ATPS Associate National Coordinator, Nigeria*
- 12:00 - 13:00 Open Discussion
Facilitator: *Diana Pound, Dialogue Matters, UK*
- 13:00 - 14:30 LUNCH

Session II: Experiences and Evidence from the Field

Chair: *Prof Oliver Saasa, Member, ATPS Board / Dr Roch Mongbo, National Coordinator, ATPS Benin*

- 14:30 - 15:00 Climate Change Impact on African Agriculture and Implications for Food Security in the Continent by *Dr. A. M. Manyatsi, University of Swaziland*
- 15:00 - 15:30 Perte de Biodiversité et Ecosystèmes Fragiles: Cas du Mali par *Dr. Abdoulaye Bayoko, Spécialiste de la physique de l'atmosphère et Dr. Mahamane Halidou Maïga, Spécialiste de la biodiversité, Université de Bamako, Mali*
- 15:30 - 16:00 TEA/COFFEE BREAK
- 16:00 - 16:30 Adaptation of local communities to climate change within a water scarce region: The case of Lake Bogoria catchment in Kenya by *Dr Mumba Musonda, World Wide Fund for Nature (WWF), Kenya*
- 16:30 – 17:00 Coping with Impacts of Climate Change on Health by *Prof Moses Chimbari, University Lake Kariba Research Station, Zimbabwe*
- 17:00 - 18:00 Round Table Discussion
Chair: Prof Lynn Mytelka and Prof Eric Eboh, African Institute of Applied Economics, Nsukka-Enugu, Nigeria

Cocktail Reception

Venue: KINGSHAKA

- 19:00 - 21:00 Cocktail Reception hosted by ATPS South Africa Chapter
Brief remarks by Rector, University of Western Cape, South Africa.

Tuesday, 20 November 2007

Session III: Working Group Sessions

Chair: Dr Julius Mangisoni *National Coordinator, ATPS Cote d'Ivoire* / Dr Arsene Kouadio, *National Coordinator, ATPS Cote d'Ivoire*

09:00 – 11:00

Working Group Sessions

Overall Facilitators: Diana Pound *Dialogue Matters, UK* and Lily Aduke, *Communications & Outreach Manager, ATPS*

WG1: *Climate Change, Agriculture and Food Security*

Venue: VIRGINIA

Chair: Prof Michael Madukwe, *National Coordinator, ATPS Nigeria*

Facilitator: Dr. Musa Dube and Dr. Absolom Manyatsi, *University of Swaziland*

The Impact of Climate Change on the Water Resources and Agricultural production

Rapporteur: Dr Spirit Tlali, *National Coordinator, ATPS Lesotho*

WG2: *Climate Change, Biodiversity Loss and Fragile Ecosystems*

Venue: RAND

Chair: Prof Joseph Obua, *National Coordinator, ATPS Uganda*

Facilitator: Ms. Hulda Gideon, *COSTECH, Tanzania*

Impacts of Climate Change on Biodiversity Loss and Fragile Ecosystems in Tanzania

Rapporteur: Dr Markos Tibbo, *National Coordinator, ATPS Ethiopia*

WG3: *Climate Change, Water Scarcity and Environmental Sustainability*

Venue: KINGSHAKA

Chair: Dr George Essegbey, *National Coordinator, ATPS Ghana*

Facilitator: Prof Eric Eboh, *Institute of Applied Economics, Nigeria*

Resource Degradation, Poverty and Growth: Implications for climate change adaptation

Rapporteur: Ms Bitrina Diyamett, *National Coordinator, ATPS Tanzania*

WG4: *Climate Change and its Effects on Health*

Venue: KINGSHAKA

Chair: Prof Ndeso Atanga, *National Coordinator, ATPS Cameroon*

Facilitator: Mr Guei Emile, *Cote d'Ivoire*

Le Captage du Methane a la de charge d'Abidjan –Akouedo

Rapporteur: Dr Papa Ndiaye, *National Coordinator, ATPS Senegal*

11:00 - 11:30

TEA/COFFEE BREAK

11:30 - 13:00

Working Group Sessions *continued*

13:00 - 14:00

LUNCH

Session IV: Working Group Reports

Chair: Dr Julius Mangisoni *National Coordinator, ATPS Cote d'Ivoire*/ Dr Arsène Kouadio, *National Coordinator, ATPS Cote d'Ivoire*

Facilitator: Mr. Maurice Bolo, *Senior Research Officer, ATPS*

14:00 - 14:20 Report from Working Group 1

14:20 - 14:40 Report from Working Group 2

14:40 - 15:00 Report from Working Group 3

15:00 - 15:20 Report from Working Group 4

15:20 - 15:50 TEA/COFFEE BREAK

Chair: Prof. Sam Wangwe, *ATPS Board Member* / Prof. Melvin Ayogu, *Dean, Faculty of Commerce, University of Cape Town*

15:50 - 16:50 Panel Discussions on WG reports and prioritization of research, capacity building and policy needs identified. (Panel members to be nominated by the working groups)

Session V – Way Forward

Chair: Dr Musa Dube, *National Coordinator, ATPS Swaziland*/ Ms Charlotte Wonani, *National Coordinator, ATPS Zambia*

16:50 - 17:30 Presentation of Conference Conclusions and Recommendations

17:30 - 18:00 Closing Ceremony
Closing Remarks by ATPS Board Members

Hon. Prof. Turner Isoun

Prof. Lynn Mytelka

Prof. Oliver Saasa

Prof. Sam Wangwe

Closing Remarks from Dr. Kevin Urama, Director, ATPS

Closing Remarks from Prof. Norah Olembo, Chair, ATPS Board

Wednesday 21 November 2007

Venue: KINGSHAKA

Chair: Dr. Kevin Urama: *National Coordinator's meeting /SWOT Analysis*

08:30 - 10:30 ATPS National Coordinators' meeting
(A separate agenda to be circulated to the concerned delegates)

10:00 - 10:30 TEA/COFFEE BREAK

Overall Facilitators: Diana Pound *Dialogue Matters, UK* and Lily Aduke, *Communications & Outreach Manager, ATPS*

- | | |
|---------------|---|
| 10:30 - 13:00 | ATPS National Coordinators' SWOT analyses
<i>(Concurrent with Board Meeting – A separate agenda to be circulated to the concerned delegates)</i> |
| 13:00 - 14:00 | LUNCH |
| 14:00 - 16:00 | ATPS National Coordinators' SWOT analyses <i>(continued)</i> |
| 16:00 - 16:30 | TEA/COFFEE BREAK |

OTHER SESSIONS

ATPS BUSINESS SESSION - BOARD MEETING

Wednesday, 21 November 2007

Venue: RAND

Chair: Prof. Norah Olembo, *Chair, ATPS Board*

- | | |
|---------------|--|
| 10:30 - 13:00 | ATPS Board Meeting <i>(Concurrent with National Coordinators' SWOT Analysis)</i> |
| 13:00 - 14:00 | LUNCH |
| 14:00 - 16:00 | ATPS Board Meeting <i>(continued)</i> |
| 16:00 - 16:30 | TEA/COFFEE BREAK |

OTHER SESSIONS

ATPS BUSINESS SESSION - ANNUAL GENERAL MEETING

Wednesday, 21 November 2007**Venue: KINGSHAKA****Chair:** Prof. Norah Olembo, *Chair, ATPS Board*

16:30 - 18:00 ATPS Annual General Meeting (*A separate agenda to be circulated at the venue*)

END OF DAY THREE**Closing Dinner****Venue: TBA****Thursday 22 November 2007**

ATPS Water and Environment/ATPS Health Innovation Systems Sessions (Separate agenda to be circulated to concerned delegates)

A. ATPS Water and Environment**Chair:** Dr. Kevin Urama, *Director, ATPS*

Resource Persons/Lead Discussants: Prof Francis Mutua, *University of Nairobi*/Dr Musa Dube, *National Coordinator, ATPS Swaziland*

This session will involve:

- a) Presentation of Survey Reports by Water and Environment baseline studies team, and*
- b) Presentation of Final Reports by the Regional Review study teams: SADC, Great Lakes and Horn of Africa and ECOWAS regions*
- c) Presentations of Selected Small Grants Case Studies: Benin, Lesotho, Uganda and Malawi*

B. ATPS Health Innovation Systems**Chair:** Dr George Essegbey, *National Coordinator, ATPS Ghana*

Resource Person/Lead Discussant: Dr Rubin Pillay, *National Coordinator, ATPS South Africa*

Presentation of progress reports by the country teams working on HIS case studies

Cote d'Ivoire, Kenya, Lesotho, Nigeria, Senegal, South Africa, Swaziland, Tanzania and Uganda

ANNEX 4: LIST OF DELEGATES



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ABOUT THE AFRICAN TECHNOLOGY POLICY STUDIES NETWORK

The African Technology Policy Studies Network (ATPS) is a multi-disciplinary network of researchers, policy makers, actors in the private sector and other end users generating, promoting and strengthening science, technology and innovation (STI) policies for African development. With a regional secretariat in Nairobi, the network operates through national chapters in 23 countries, with an expansion plan to cover the entire sub-Saharan Africa (SSA).

The strategic objective of the network is to build Africa's STI capacity through a six pronged approach: STI Research and Research Capacity Building; International Cooperation and Partnerships; Youth and Gender Empowerment; Training and Sensitization; Science Communications and Stakeholder Dialogue, and Outreach, Knowledge Brokerage and Policy Advocacy. ATPS is committed to translation of research results to sustainable technologies and innovations for development through a number of proactive measures to disseminate research results to policy makers, legislators, the organized private sector, civil society, mass media and stakeholder groups. These include publications, dialogue and advocacy. Among its range of publications are the Working Paper Series (WPS), Research Paper Series (RPS), Special Paper Series (SPS), Technopolicy Briefs, Workshop Reports, and Newsletters. ATPS is also engaging journalists to disseminate science through national newspapers and other media.

ATPS has been supported by a growing number of donors including the Royal Dutch Government, the International Development Research Centre (IDRC), the Carnegie Corporation of New York, the Rockefeller Foundation, the World Bank, the OPEC Fund, Ford Foundation, Coca-Cola Eastern Africa, the African Development Bank, InfoDev, the Nigerian Government, etc. In collaboration with like minded institutions, ATPS also participate in consortia based joint projects under the auspices of the EU Framework 6 and Framework 7 programs as well as other sources.

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List of Abbreviations and Acronyms

AGM	Annual General Meeting
AIAE	African Institute for Applied Economics
AIDS	Acquired Immune Deficiency Syndrome
ASEE	African Society for Ecological Economics
ATPS	African Technology Policy Studies Network
AU	African Union
AYFST	African Youth Forum in Science and Technology
AWSTF	African Women in Science & Technology Forum
BBC	British Broadcasting Corporation
BOD	Bio-oxygen Demand
BTA	Biotechnology Trust Africa
CBOs	Community Based Organizations
CCAA	Climate Change Adaptation in Africa
CCK	Communication Commission of Kenya
CDM	Clean Development Mechanism
COMESA	Common Market for Eastern and Southern Africa
CTA	Technical Centre for Agricultural and Rural Cooperation
DFID	Department for International Development
DMC	Drought Monitoring Center
DRR	Disaster Risk Reduction
ESRI	Economic and Social Research Institute
EU	European Union
GAA	Global Amphibian Assessment
GCM	General Circulation Models
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GHA	Great Lakes and Horn of Africa
GHG	Green House Gas
GIS	Geographic Information Systems
HIV	Human Immuno-deficiency Virus
ICPAC	IGAD Climate Prediction and Application Centre
ICT	Information and Communication Technology
IDNDR	International Decade for National Disaster Reduction

IDRC	International Development Research Center
IFMs	Innovative Financing Mechanisms
IFPRI	International Food Policy Research Institute
IGAD	Inter Governmental Authority on Development
IK	Indigenous Knowledge
ILRI	International Livestock Research Institute
IPCC	Inter-governmental Panel on Climate Change
IWMI	International Water Management Institute
IWSD	Water and Sanitation Development
KIPPRA	Kenya Institute for Public Policy Research and Analysis
LDCF	Least Developed Countries Fund
MDGs	Millennium Development Goals
MIT	Massachusetts Institute of Technology
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organisation
NBI	Nile Basin Initiative
NEMA	National Environmental Management Authority
NEPAD	New Partnership for Africa's Development (NEPAD)
NGOs	Non-Governmental Organizations
OPEC	Organisation of the Petroleum Exporting Countries
PAR	Participatory Action Research
PPP	Public Private Partnerships
R&D	Research and Development
SADC	Southern African Development Community
SCCF	Special Climate Change Fund
SSA	Sub-Saharan Africa
S&T	Science and Technology
STI	Science, Technology and Innovation
SWOT	Strength, Weaknesses, Opportunities and Threats
UCT	University of Cape Town
UK	United Kingdom
UK-POST	UK Parliamentary Office for Science and Technology
UN	United Nations
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCCs-CDM	United Nations Framework Convention for Climate Change's Clean Development Mechanism
UWC	University of Western Cape
W&E	Water and Environment
WatBal	Water Balance Model

WATERNET	Water Network
WHO	World Health Organization
WRI	Water Research Institute
WRUA	Water Resources Users Associations
WWF-EARO	World Wide Fund - East African Regional Office

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