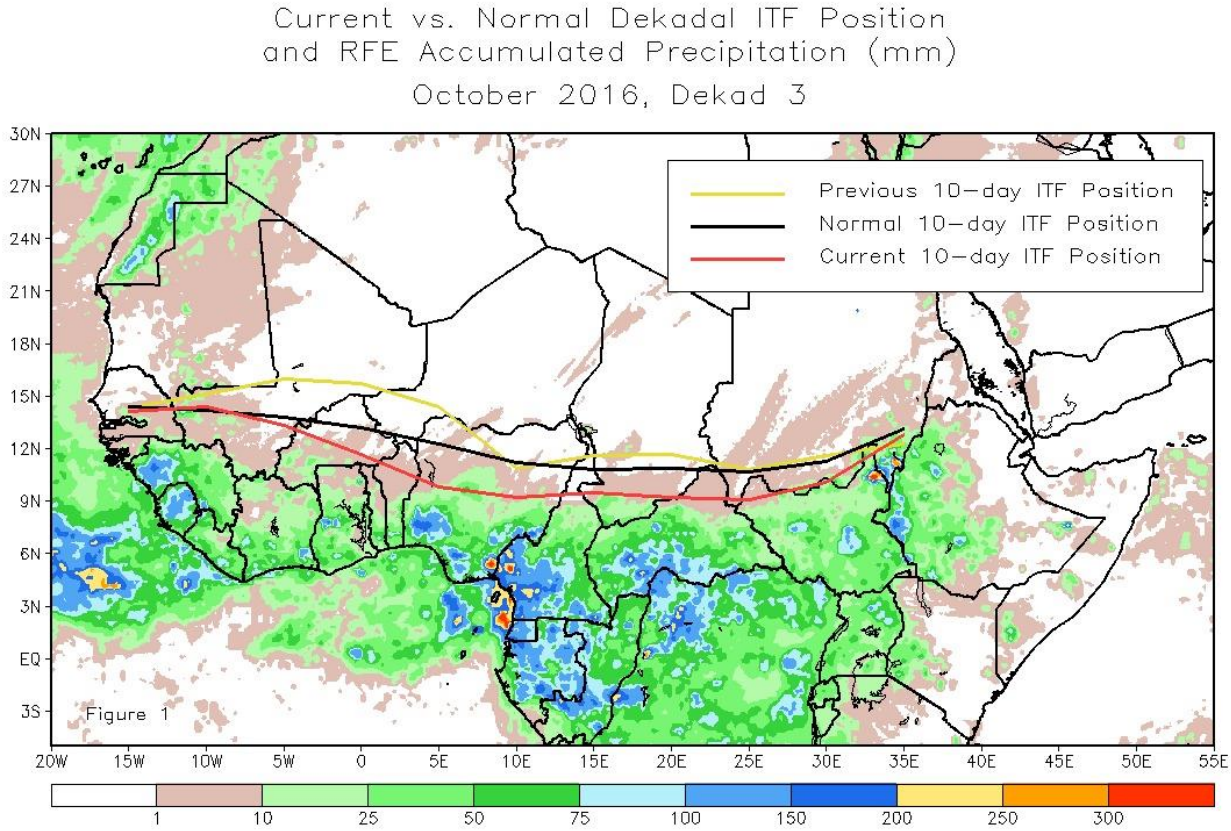
REPORT OF ISACIP WORKSHOP: SENSITIZATION WORKSHOP FOR LEGISLATORS

"WEATHER AND CLIMATE INFORMATION - RESOURCE FOR SUSTAINABLE DEVELOPMENT

Held from 12th – 13th December 2016 in Accra, Ghana



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A. BACKGROUND

Meteorology is the science, which focuses on weather and climate. But in reality it has several application areas that are of great importance to many socio economic sectors. However, many decision makers, and in particular, legislators are not well informed of the sensitive role that **Meteorological Applications could play in the socio economic development of our countries.**

The importance of the role of legislators in the management of a country's resources could be enhanced if the legislators are equipped with information and knowledge about the benefits of services that are not immediately obvious. This could enable them make informed decisions in support of sectors such as meteorological science and its applications that will contribute immensely to Sustainable Development. More importantly, laws could be promulgated that could address some of the obstacles encountered by Meteorological institutions in carrying out their mandate, mission and vision.

The most challenging task of meteorologists, climatologists and hydrologists is how to transmit their scientific predictions and forecasts, formulated in uncertain outcomes to legislators, authorities, and other user communities like the mass media and the public at large. Policy and decision makers need to formulate policies and take decisions for implementation and hence need exact information. On the other hand, NMHS's need timely and innovative resources to continuously collect, collate, analyse and disseminate reliable hydrometeorological data and information with reduced uncertainties inherent in meteorological and hydrological processes. It must be emphasised that unverified predictions can lead to an underestimation of subsequent predictions and general apathy whilst verified predictions can lead to overestimation of the risk and hence to panic. The system of information flow should in particular seek to avoid the 'WOLF' phenomenon. Herein lies the necessity to break down the complex climatic and weather dynamics into simple and understandable information to legislators in particular and user communities in general.

Climate lies at the basis of all cultures, be it cold or hot, wet or dry. There seems to be systematic and important links between weather, climate, and behaviour of people in a given society. Inclement weather increases the costs of moving from place to place. Sunlight enhances while extreme temperature depresses mood. Finally, hot weather is associated with enhanced aggression. Such attributes of climate have implications for a variety of decisions and actions across politics, hence very pertinent for legislators who are basically elected politicians. For example, hot climates and rain may reduce levels of social capital while rain does have a depressive effect upon voting rates among the poor due to raising the costs associated with voting. Moreover in the temperate climates, sunlight boosts voting in the winter and spring seasons while summer humidity depresses voting and heat in winter has a positive effect. Timely and reliable weather forecasts have therefore the propensity to inform legislators on the behavioural patterns of would be electorates in particular and the public at large.

Water availability and distribution, on the other hand, is intrinsically linked to climate dynamics. The main climatic mechanism that influences moisture input into Africa is the movement of the Inter-Tropical Convergence Zone (ITCZ) over the continent. The seasonal rainfall amounts over Africa are basically attributed to the position of the Inter-Tropical Front coupled with the strengths of the south westerly monsoons and the upper easterly air currents, and accentuated by local physiographic and orographic conditions. The distribution of rainfall over Africa therefore exhibits extreme unevenness, both spatially and temporally. Water availability is therefore unevenly distributed across the continent in time and space, creating a perceptive syndrome of WATER EVERYWHERE, WATER NOWHERE. Even though water is generally considered as life, its value

perception differs from society to society. The concepts underlying the intrinsic value of water are still debatable depending on the two indispensable attributes of water as an economic good and for its social value. The value of water in its totality encompasses the complex interactions between human beings and water as a natural resource. It has therefore different meanings for people from different societal and cultural backgrounds and in different climatic set-ups.

Historically, water was available in ample supply and therefore was treated as a free good, and continued to remain so even with increases in population and economic growth. As a consequence, many rivers and groundwater sources have become polluted and water is now a scarce resource. Water has been traditionally provided to meet demand. However, it is becoming prohibitively expensive to resort to large-scale infrastructural solutions for providing water to meet ever-increasing demands. Generally, the range of value perspectives will vary to some extent on a case-by-case basis and on the stakeholder groups involved. (Note that value perspectives are not the same as stakeholder perspectives, and in fact are often shared across stakeholder groups.) Some examples of value perspectives include:

- Environmental Values
- Social Values
- Public Health Values
- Economic Values
- Production (including Agriculture) and Product Use Values
- Political Values
- Gender Values

In order to provide quantitative expressions of the value attributes, ACMAD, Regional Weather and Climate Centres and NMHS's must be adequately resourced to deliver timely, reliable and continuous data and information to end user communities for up-to-date designs of water resources systems, mitigation of hydrometeorological disasters and climate change mitigation and adaptation interventions. The overall socio economic value of weather and climate data and information will then be further enhanced by the reduction of opportunity costs due to improper design and management of climate related infrastructural systems within the framework of sustainable development.

B. Workshop for Legislators on weather & climate information
THEME: Weather and Climate Information – Resource for Sustainable Development
December 12-13, 2016

In order to sensitize Legislators about the use of weather and climate information in decision-making towards sustainable development, the African Centre of Meteorological Applications for Development (ACMAD) convened the workshop as a platform for two worlds of science and legislature, as policy and decision makers, to interact and share knowledge on the relevance of weather and climate information as a resource in different socio-economic sectors for sustainable development in Africa. The importance of the role of legislators in the management of a country's resources could be enhanced if the legislators are equipped with information and knowledge about the benefits of services that are not immediately obvious. This could enable them make informed decisions in support of sectors such as meteorological science and its applications that will contribute immensely to Sustainable Development. More importantly, laws could be promulgated that could address some of the obstacles encountered by Meteorological institutions in carrying out their mandate, mission and vision.

1. Objectives

The objectives of this workshop were:

- To raise awareness of legislators on the value of meteorological information and applications for sustainable development in developing countries**.**
- To make some recommendations that will help overcome problems encountered by actors in the process of generating products and services. Issues include observation networks, data policies and sharing, dissemination issues, tools and support, environmental policies, etc.
- To establish the need to prepare laws in support of Meteorological sciences and its applications for sustainable development.

2. Presentations and Discussions

The workshop spanned two days and was broken into three thematic sessions, each consisted of topical presentations that gave an insight into physical and socio economic aspects of weather and climate in Africa and prospects of consensus building with legislators towards establishing networks of legislators at the national, sub regional and continental levels. There were two main outputs in the form of recommendations and a declaration in the form of resolutions. The main thrust of the presentations was directed at informing the legislators about the need to acquaint themselves with the diverse roles weather and climate data and information play in the lives of millions of African citizenry and in the much needed sustainable socio-economic development. Presentations and ensuing discussions under three sessions, including a panel discussion led by five legislators are hereby summarised as below.

a. Session 1: Sensitization of weather and climate information as resources for development

Climate and weather information find use in almost all socioeconomic sectors, bearing in mind that the primary producers of weather and climate information in our countries are the National Meteorological and Hydrological Services (NMHSs). The NMHS is a fundamental part of the national

infrastructure and plays an important role in supporting vital socio-economic functions such as in agriculture and food security, water resources, health, energy, transportation, and many more for sustainable development of African societies. This role obligates the NMHSs to provide better early warning services to reduce disaster risks, and support national development and life-supporting activities that are related to weather and climate. It also requires conducting systematic observations and data gathering that form the foundation for the monitoring and prediction of weather, climate, water and related environmental conditions, as well as the issuance of warnings, alerts and advisories. An effective and efficient service delivery of Weather, Climate, Water information is critical as well as the collaboration with the media to deliver forecasts and warnings to the last mile user communities and foster international cooperation through exchange of meteorological data and products that enables real-time forecasting activities.

However, there is marked disparity in the sparse networks for systematic observations in Africa that do not adequately represent the weather and climate conditions affecting our countries. The sparse observation networks ultimately affect the quality and range of services that NMHSs can provide. Moreover, the introduction of innovative modern technologies into the monitoring and prediction activities of NMHSs is largely very slow or absent in most African countries. It is important to bring this deplorable condition in Africa to the attention of our legislators.

i. Essence of Climate and Weather Information

The essence of data is to affect a decision. The direct value of meteorological and hydrological data finds its expressions in planning and development, project design, management of water resources systems and risk reduction. The socio economic benefits of climate data and information can be directly estimated for their impacts on design and management of planning, design and management of policies and projects. Opportunity costs due to failure and destruction of infrastructure, loss of life and property due to lack of reliable and timely information constitute the socio economic costs of the expected data and information.

The need for better understanding and application of weather and climate information in Africa is therefore more compelling now than ever before, because the continent is currently experiencing severe weather events and extreme climate conditions with negative impacts on the welfare of millions of the people. Violent and hazardous weather events and climate episodes have become more frequent and widespread. The implication of this is that the traditional forecasting of climate patterns using indigenous knowledge is no longer reliable for planning by rural farmers and other vulnerable communities whose economic activities depend on weather and climate. Persistent droughts and flooding, delay in onset of rains, early cessation of the rains and short rainy season including pronounced dry spells have caused low agricultural productivity for a continent that is dependent on rain fed agriculture. Inadequate water resources resulting from reduction in quantity of river flow and lakes, except during periods of flood, have resulted in fewer water supplies for use in agriculture, lower hydropower generation and other users. There is already an increasing incidence of diseases, and a rising number of heat waves. Indeed, one of the greatest challenges to mankind in contemporary times is the increasing frequency of severe weather and extreme climate events, which often result in destruction of physical infrastructure, loss of lives and means of livelihood, as well as displacement of persons. These are obvious threats to socio-economic development and are setting back years of achievement in sustainable development. These losses in productivity and destruction of infrastructure in terms of cost give indications of the opportunity costs of lack of useful data and information. The cost of taking action is usually less than the cost of no action.

ii. Socio Economic Benefits of Weather and Climate Information

Socio economic benefits of weather and climate information are intrinsically linked to the availability of continuous, reliable and timely meteorological data. Weather and climate information to the agricultural community help to improve production; reduce losses and risks, reduce costs and increase efficiency in the use of water and energy, among others. In the aviation industry, products and services contribute to the safety of aviation and economic operation of the sector both nationally and internationally. The measurements and forecasts of conditions en route and at, or in the approach to, terminal aerodromes are useful for minimizing aircraft operating costs. Early warnings and alerts of extreme events provided, when coupled with effective emergency response systems, contribute to reducing the impact of these events on lives and property. Other areas include; forecasts and warnings of floods, water levels and discharge within river basins, watersheds and coastal areas; marine meteorological forecasts and warnings of coastal and open ocean conditions that are vitally important for marine transport and operations, safety of life and property in coastal areas and for operations of ports and harbours. In the health sector, the provision of products such as daily forecasts of temperature, humidity and air-quality as well as long-range predictions and severe weather warnings, helps in monitoring disease outbreaks and is important for planning and providing public health; etc. Therefore, the integration of weather, climate, water and related environmental information into national planning and development policies is an essential element in reducing the risks associated with severe weather and extreme climate events

iii. Impacts of Extreme Events/climate change on different sectors (e.g. Agriculture, Water, Disaster Risk Reduction, Infrastructure)

The well-known variability of climatic fluxes over the continent can sometimes assume dramatic proportions leading to frequent occurrences of floods and droughts. In physical terms hazards are extreme rare events and cannot be prevented whilst their social impacts as disasters can be mitigated, reduced and/or prevented. A disaster is said to occur when an extreme event coincides with a vulnerable physical and socio-economic set up, surpassing society's ability to control or survive the consequences. Within a given physical milieu the climate, geology, and the socio-economic entity interact to determine the susceptibility of the territory to natural disasters. The livelihoods of millions of "Ecosystem" people of Africa are critically dependent on a highly variable climate and, it is therefore essential that climate variability and associated risks are managed intelligently, as an integral part of the development process. Managing Risks due to hydroclimatic extreme events for sustainable development should therefore entail incorporating the prediction of anomalous climate variability into the general socioeconomic development process.

More often than not, it is wrongly assumed that floods and drought are about the opposite signs of the climatic process. In reality, they are triggered by different physical dynamics of weather and climate. Flood is an extreme event specific, hydrological in essence, and can be persistent and pervasive. Drought on the other hand is hydro-climatically a non-event, slow in nature, and can exert impact vulnerabilities over a large expanse of territory. The main problem of predictability of hydroclimatic processes is posed by the uncertainty inherent in the perception and understanding of the physical mechanisms triggering the variability in climatic fluxes and in the hydrological cycle due to insufficient and unreliable data in time and space.

Generally, drought can be defined as a moisture deficiency resulting in a loss of beneficial use of water by human activities and by the managed and unmanaged ecosystems upon which such human activities depend for sustenance. Droughts can occur in different physical and social environments such as:

- Meteorological - designated period of time with precipitation less than a specified amount
- Hydrological - a period when stream flows are unable to supply established users under a given water management system like hydropower and water supply.
- Agricultural - lack of moisture at different times in the growing season to meet crops water needs at various stages of plant growth leading to lower yields, lack of good harvests and possible food shortages.
- Socio-economic - supply and demand of specific goods due to lack of sufficient stocks to cover the drought period.

Vulnerability of society due to floods is exacerbated as population density increases and exert pressure on land coupled with unplanned urbanisation and lack of relevant infrastructure. Floods usually impact:

- Settlements and Installations in Flood Plains and at mountain slopes and feet
- Dams and Reservoirs
- Erosion, Sedimentation and Landslides
- Farms and Plantations
- Roads and Bridges

One way to measure the impact of a disaster is to look at changes in Gross National Product (GNP) or Gross Domestic Product (GDP). Measures of GDP over time show that economic downturns often materialize after a drought. For example, in the year after the 1984 droughts in Sub-Saharan Africa, the GDP for Mali, Niger, and Ethiopia fell by 9 percent, 18 percent, and 7 percent, respectively. Zimbabwe's GDP declined 3 percent after the 1983 drought.

b. Session 2: Climate Variability and Climate Change (Adaptation)c

The climate of Africa exhibits high interannual and interdecadal variability across the continent with subregional differential accentuations in magnitude and frequency. The main influencing factors include anomalous excursions of the ITCZ, variations in Sea Surface Temperatures (SSTs), the El Nino Southern Oscillation (ENSO) and prevailing sub regional winds. The ENSO is considered as the most dominant perturbation responsible for interannual climate variability over eastern and southern Africa. Eastern Africa is in phase with warm ENSO episodes, whereas southern Africa is negatively correlated with these events. Even though ENSO is not the dominant factor controlling rainfall in the Sahel and similar areas of West Africa it appears to influence year-to-year variations and reduces rainfall. The key factor that is responsible for interannual variability of the climate over northern Africa is the North Atlantic Oscillation (NAO). The intensification of climate variability resulting in frequent extreme climate anomalies is attributed to the ongoing climate change phenomenon, especially changes in climate variability through droughts and floods. Historically and traditionally Africans have adapted to patterns of climate variability through land-use systems that minimize risk, with agricultural calendars that are closely tuned to typical conditions and choices of crops and

animal husbandry that best reflect prevailing conditions. But the present ongoing rapid changes in climate variability poses new challenges to confront the imminent severe disruption of production systems and livelihoods, especially the poor who directly depend on climate and ecosystems for their socio economic activities. .There is an urgent need for NMHSs to intensify data collection activities at the relevant time scales and spatial sufficiency in order to improve predictive tools for the climate variability of today, necessary for the climate change of tomorrow.

i. Global Targets (e.g. Sendai, CoP21, SDGs, Agenda 2063) – Climate Financing

It is also clear that Africa cannot do it all by itself and should therefore take advantage of global and continental policy programmes and targets which, more often than not, serve as a vehicle for accelerated actions to national, sub-regional and regional actions. It requires strong political commitment to these initiatives towards the development and dissemination of tools for integrating environmental, social and economic objectives, and making trade-offs between them. There is therefore the need to enhance coherence between the international programmes and African initiatives by identifying synergies, and developing sustainable development criteria which can be widely applied to development plans and processes for implementation on the ground, by supporting activities of local authorities, organizations and communities in their local context, and improving feedback mechanisms from local to national and international levels. For example, a comparative analysis on the SDGs and Agenda 2063 indicate that there is a convergence of about 63% and that the First Ten-year Implementation Plan for Agenda 2063 is the vehicle for implementing the SDGs.

Conference of Parties CoP21

The international political response to climate change began at the Rio Earth Summit in 1992, where the 'Rio Convention' included the adoption of the UN Framework Convention on Climate Change (UNFCCC). This convention set out a framework for action aimed at stabilising atmospheric concentrations of greenhouse gases (GHGs) to avoid "dangerous anthropogenic interference with the climate system." The UNFCCC now has a near-universal membership of 195 parties. The main objective of the annual Conference of Parties (COP) is to review the Convention's implementation. The first COP took place in Berlin in 1995 and significant meetings since then have included COP3 where the Kyoto Protocol was adopted, COP11 where the Montreal Action Plan was produced, COP15 in Copenhagen where an agreement to succeed Kyoto Protocol was unfortunately not realised and COP17 in Durban where the Green Climate Fund was created.

In 2015, COP21, also known as the 2015 Paris Climate Conference, for the first time in over 20 years of UN negotiations, was poised to achieve a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C.The conference was expected to attract close to 50,000 participants including 25,000 official delegates from government, intergovernmental organisations, UN agencies, NGOs and civil society. This was also the largest number of Heads of State and Government ever hosted in the history of France: over 150 Heads of State and Government from around the world (including Barack Obama from the US, Xi Jinping from China, Narendra Modi from India and Vladimir Putin from Russia). About 117 ministers responsible for international climate negotiations attended the High-Level Segment which launched the following initiatives:

- the Mission Innovation (Clean Tech) initiative. This is a commitment by States to double their research and development budgets by 2020 and by private investors to increase their own investments.

- the Solar Alliance. This is a shared platform for cooperation between the countries with considerable solar resources that are leading the project: Brazil, Peru, Ethiopia, Mauritius, Nigeria, the Netherlands, Indonesia, UAE and Fiji.
- There was also a carbon pricing panel, chaired by the World Bank and the IMF, in the presence of the American and Chinese Presidents in particular. This event enabled committed world leaders to encourage their peers to support carbon pricing on an international scale. It was the first meeting on the subject among leaders at this level.

Another high level of ambition was to reach an agreement on financial support for countries of the South, and burden sharing between developed and developing countries on climate change mitigation and adaptation.

Sustainable Development Goals (SDGs) 2030

The concept of sustainable development was first brought to the forefront of natural resources development within a sustainable environment at the United Nations Conference on Environment and Development, held in Rio de Janeiro, 1992. Unlike the just ended Millennium Development Goals (MDG), the SDGs were formulated in a framework of broad principles relevant to both developed and developing countries. It consists of 17 goals and most applicable to climate and water issues are:

Goal 2: End hunger, achieve food security and adequate nutrition for all, and promote sustainable agriculture
Goal 6: Secure water and sanitation for all for a sustainable world
Goal 13: Promote actions at all levels to address climate change
Goal 14: Attain conservation and sustainable use of marine resources, oceans and seas
Goal 15: Protect and restore terrestrial ecosystems and halt all biodiversity loss

Within the general framework of accelerated socio-economic development of African countries, there are also cross cutting goals with climate and water, including:

Goal 1: End poverty in all its forms everywhere
Goal 3: Attain healthy life for all at all ages
Goal 7: Ensure access to affordable, sustainable, and reliable modern energy services for all
Goal 8: Promote strong, inclusive and sustainable economic growth and decent work for all
Goal 9: Promote sustainable industrialization
Goal 11: Build inclusive, safe and sustainable cities and human settlements
Goal 13: Promote actions at all levels to address climate change
Goal 17: Strengthen and enhance the means of implementation and global partnership for sustainable development

AGENDA 2063 – A global strategy to optimize use of Africa's resources for the benefits of all Africans

Agenda 2063 – *a shared strategic framework for inclusive growth and sustainable development* – was developed through a people-driven process and was adopted, in January of 2015, in Addis Ababa, Ethiopia by the 24th African Union (AU) Assembly of Heads of State and Government, following 18 months of extensive consultations with all formations. The Framework Document seeks to accelerate Africa's political, social, economic and technological transformation while

continuing the Pan African drive for self-determination, freedom, progress and collective prosperity.

1. Agenda 2063 is anchored on the AU vision and is based on the seven aspirations derived from the consultations, namely:
2. *A prosperous Africa based on inclusive growth and sustainable development;*
3. *An integrated continent, politically united, based on the ideals of Pan Africanism and the vision of Africa's Renaissance;*
4. *An Africa of good governance, respect for human rights, justice and the rule of law;*
5. *A peaceful and secure Africa;*
6. *An Africa with a strong cultural identity, common heritage, values and ethics;*
7. *An Africa whose development is people-driven, relying on the potential of African people, especially its women and youth, and caring for children; and*
8. *Africa as a strong, united, resilient and influential global player and partner.*

Aspiration 1: *A Prosperous Africa, based on Inclusive Growth and Sustainable Development*
Relevant to weather and climate, this aspiration states, inter alia that: "radically transforming African agriculture to enable the continent to feed itself and be a major player as a net food exporter; exploiting the vast potential of Africa's blue/ocean economy; and finally putting in place measures to sustainably manage the continent's rich biodiversity, forests, land and waters and using mainly adaptive measures to address Climate change risks."

Goal 5: Modern Agriculture for increased productivity and production:
- Agricultural productivity and production

Goal 6: Blue/ ocean economy for accelerated economic growth
- Marine resources and Energy
- Ports Operations and Marine Transport

Goal 7: Environmentally sustainable and climate resilient economies and communities
- Bio-diversity, conservation and sustainable natural resource management.
- Water security
- Climate resilience and natural disasters preparedness and prevention
- Renewable energy

Aspiration 2: *An integrated continent politically united and based on the ideals of Pan Africanism and the vision for Africa's Renaissance*
Goal10: World Class Infrastructure criss-crosses Africa
- Communications and Infrastructure Connectivity

Key Transformational Outcomes by 2023
The Agenda has been programmed over a series of five ten year implementation plans developed to realize the vision of the "Africa We Want By 2063".

The targets covering the period 2013-2023, is the first of the series and relevant amongst them are:

- Nine out of ten persons will have access to safe drinking water and sanitation; electricity supply and internet connectivity will be up by 50% and cities will be recycling at least 50% of the waste they generate.

- The beginnings of value addition blue economy – fisheries, eco-friendly coastal tourism, marine bio-technology products and port operations- will emerge.
- At least 17% of terrestrial and inland water and 10% of coastal and marine areas would have been preserved and 30% of farmers, fisher folks and pastoralist will be practicing climate resilient production systems.
- The inception gains from the economic transformation will go hand in hand with improved environmental conditions. At least 17% of terrestrial and inland water and 10% of coastal and marine areas would have been preserved. All trans boundary natural resources would have been shared equitability and would be exploited to the benefit of the African Citizenry. Lastly a third of farmers, fisher folks and pastoralists will be practicing climate resilient production systems.
- The foundations of a world class infrastructure – transport, energy, water, e-connectivity will be noticeable in the continental economic system
- ⍰⍰Regional power pools boosted by at least 50% increase in power generation and the INGA (INGA means?) dam will be operational and will contribute to the powering of the industrial transformation of the continent and comfort of the citizenry.

Third World Conference for Disaster Risk Reduction (Sendai)

The close collaboration between, AUC, WMO and the United Nations International Strategy for Disaster Reduction (UNISDR) in combating the Weather and Climate related disasters in the African Region was well appreciated for its role in **encouraging** the need to integrate disaster risk reduction (DRR) and climate change adaptation (CCA) for enhanced coherence in tackling climate risks and disasters in the continent. In the aftermath of the Hyogo Framework of Action (HFA) (2005-2015), a post 2015 framework for DRR was established during the Third World Conference for Disaster Risk Reduction (Sendai, Japan, March 2015), which emphasizes the need to employ the principle of Common but Differentiated Responsibilities (CBDR) in the management of multi-hazard / hydro-meteorological disaster risks.

ACMAD should seize the opportunity to initiate steps to promote AMCOMET Members to work closely with the AUC, Regional Economic Communities (RECs), WMO and UNISDR for synergy in addressing weather and climate induced risks and vulnerabilities.

Monitoring for Environment and Security in Africa (MESA)

The Monitoring for Environment and Security in Africa (MESA) Programme is funded by the European Development Fund (EDF), and implemented by the African Union Commission (AUC), through the participating Regional Economic Communities (RECs) and Regional Implementing Centres (RICs). MESA will upgrade over 50 PUMA 2010 satellite reception stations installed in the NMHSs and regional centres, into new PUMA 2015 stations, ensuring continuous access to satellite and various meteorological data. The MESA Programme will also provide training, through four regional training centres, to all beneficiary NMHSs for the operation of these stations and exploitation of the received information.

ii. Mainstreaming Climate Variability and Climate Change Issues into Africa's Development Policies and Practices.

Floods and Droughts in Africa are normally linked to the fluctuations in frequency-magnitude relationship of the climatic fluxes over the sub region, attributed to among others, the anomalous behaviour of the Inter Tropical Convergence Zone (ITCZ) and Sea Surface Temperatures (SST's) over

the Indian and the Atlantic Oceans, induced by the El Nino Southern Oscillation (ENSO) and exacerbated by intensifying climate variability and change. The challenge of mainstreaming impacts of climate variability and change is to fuse early warning of both short-lived natural disasters and long-term hazards associated with environmental change, improved preparedness, adaptation, mitigation of their adverse effects and the integration of disaster management into the framework of Integrated Climate, water and environment monitoring systems towards an overall socio-economic development planning at all levels. This implies developing effective and reliable disaster management strategies for coping with extremes of climate, the growing water scarcity, and the shrinking and disappearance of water bodies.

There is the need to establish Early Warning Systems (EWS) at national, regional and continental levels within emergency preparedness strategic plans, involving the following key processes:

- Collection of data and information on the occurrence and impacts of the hazards and vulnerability
- Processing and analyzing the data to generate early warning information
- Dissemination of decision-making information to users
- Guiding timely and effective response to official warnings
- Reaction of authorities and public to alert and warning messages

Emergency preparedness is a strategic planning of risk reduction interventions put in place before the hazard strikes with set of actions necessary for protecting life, infrastructure and ecosystems. The key role of early warning system is to provide a complex of predictions and forecasts of an extreme event with the aim of enhancing the forecast lead time to obtain socially optimal time for disaster mitigation. The effectiveness of such emergency plans will largely depend on the gains to be made for enhancing the lead time of real time forecast which will allow emergency preparedness plans and strategies to be put in action before the arrival of the hazard. This entails …

In order to obtain some socially necessary lead time for timely disaster management interventions, it is imperative to extend investigations to cover the behavioural patterns of rainfall extremes and/or anomalies and directed towards the climatic and atmospheric mechanisms at synoptic and mesoscales scales that could trigger such anomalies. This approach may lead to the identification of predictors for rainfall anomalies based on teleconnections of extreme events both inside and outside the northern and southern hemispheric regions of Africa. This can then pave the way to couple climatic and meteorological real time forecasting with specific system forecasting for enhanced lead time:

- Anomalous excursions of the Intertropical convergence zone (ITCZ) which affects regional climate fluctuations
- Spatial Coherence of Rainfall Anomalies
- (Intra and inter?) Teleconnections of Rainfall Anomalies
- Indian and Atlantic Oceans Sea Surface Temperatures induced by the global ENSO tele-connection and correlates to El Nino and La Nina Events - a warmer Indian Ocean leads to an increased frequency of tropical cyclones and strengthened equatorial surface westerlies
- Modification of the frequency-magnitude relationships due to Climate Change - Higher intensity and lower duration rainfall events.
- Sub-regional Storm Tracking System for real time forecasting of extreme rainfalls.
- Timely prediction of seasonal rainfall

This is one of the surest way to integrate disasters of weather and climate origin with socio-economic development plans of African countries susceptible to severe impacts of climate variability and change.

Adapting Africa's Infrastructure to Climate Variability and Change

The urgency to formulate adaptation strategies for infrastructure plans and investments to reduce the risk of climate variability and change have been quantitatively analysed in a document prepared by the World Bank in collaboration with the United Nations Economic Commission for Africa (UNECA). The document, entitled **Enhancing the Climate Resilience of Africa's Infrastructure,** quantifies the impacts of climate change on hydropower and irrigation infrastructure and identifies adaptation options as well as recommendations for increasing climate resilience. While ignoring climate change could result in planning and designing infrastructure unsuitable for future climates, the study points to a risk of adapting to climate change in the wrong way, which could be as significant to the damages when not adapting.

"The solution to this dilemma is to identify an adaptation strategy that balances the risk of inaction with the risk of wrong action, taking into account the preferences of decision makers and attitudes toward risks, the time to act is now so that adaption to climate change in infrastructure is realized and becomes a component of all investment plans."

Decision-makers need information and tools to create adaptation plans responsive to their particular situations. The report provides actionable steps to increase resilience in Africa's infrastructure. This includes providing technical guidelines on integrating climate change into planning and design of infrastructure. To bring down the cost of analysis needed to integrate climate considerations into infrastructure development, it suggests creating an open data repository. The report recommends a climate resilience project preparation facility to support plans for infrastructure investments, and training programs for professionals involved in planning and design. Finally, an observatory on climate-resilient infrastructure development would be helpful to retain visibility of technical work at the policy level.

ACMAD is called upon to seize the opportunity to take a technical and leadership role in capturing the capacity building and the climate-resilient infrastructure development observatory, not only to boost up its visibility but also facilitate its mobilisation drive for resources.

Finally, it is noted that: *"Climate change requires new approaches that will help make infrastructure investments in Africa more resilient to the uncertain climate of the future. No action is not an option,"*

iii. The role of climate institutions (ACMAD, ICPAC, SADC-CSC, AGRHYMET, ECPAC) in the production of Climate information and services for development

The evolving establishment of the African Ministerial Conference on Meteorology (AMCOMET) by the African Union Commission (AUC) and the World Meteorological Organisation necessitates the realignment of the architecture of weather and climate institutions at all levels. AMCOMET is basically a continental political forum of ministers of African countries responsible for meteorological service provision. ACMAD is also continental but scientific and technical in essence and has a multidisciplinary competence in weather and climate information and its applications in all relevant sectors of society. There are a number of regional weather and climate centres. Mandates and/or missions of some of these institutions cover the following:

African Ministerial Conference on Meteorology (AMCOMET)

AMCOMET Called for

- Development of an African Strategy on Meteorology to effectively meet government and societal needs and requirements for weather and climate information and services. The document has been completed.
- This will bring Enhanced awareness of the value of meteorology for sustainable development

- Mission of AMCOMET
  - Provide political leadership, policy direction and advocacy in the provision of weather, water and climate information and services that meet government and societal needs

African Centre of Meteorological Applications for Development (ACMAD)

- Provision of weather and climate information and for the promotion of sustainable development of Africa (notably within the context of national strategies for poverty eradication), in the fields of agriculture, water resources, health, public safety and renewable energy.
- Carries out mission through capacity building for the 54 NMHSs, in weather prediction, climate monitoring (extreme events, etc), transfer of technology (telecommunications, computing and rural communication) and in research.

Centre Regional de Formation et d'Application en Agrométéorologie et Hydrologie Opérationelle (AGRHYMET)

Agrhymet's Mandate

- The Centre Regional de Formation et d'Application en Agrométéorologie et Hydrologie Opérationelle (AGRHYMET) is a specialised institution of the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS) with the mission of promoting information and training related to food security, desertification control and the management of natural and water resources.

The Centre informs and train people on Sahelian food security, desertification control and water control and management (http://www.agrhymet.ne/eng/presentation.html#)

- Formed in 1974.
- Countries AGRHYMET is responsible for: Benin, Burkina Faso, Cape Verde, Chad, Ivory Coast, Gambia, Guinea Bissau, Mali, Mauritania, Niger, Senegal and Togo.

IGAD Climate Prediction and Applications Centre (ICPAC)

ICPAC's Mandate:

In 1989, twenty four countries in Eastern and Southern Africa established a Drought Monitoring Centre with its headquarters in Nairobi (the DMCN) and a sub centre in Harare (DMCH) in response to the devastating weather related disasters. In October 2003, the Heads of State and Governments of the Intergovernmental Authority on Development (IGAD) held their 10th Summit in Kampala, Uganda, where DMCN was adopted as a specialized IGAD institution. The name of the institution was at the same time changed to IGAD Climate Prediction and Applications Centre (ICPAC) in order

to better reflect all of its mandates, mission and objectives within the IGAD system. A Protocol integrating the institution fully into IGAD was however signed on 13 April 2007.
Countries ICPAC is responsible for: Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Sudan, Uganda, Burundi, Rwanda and Tanzania.
These two institutions are mandated to provide climate and seasonal forecasting services in their respective region
(https://www.eumetsat.int/website/home/AboutUs/InternationalCooperation/Africa/CooperationwithAfricanInstitutions/index.html)

Southern Africa Development Community - Climate Services Centre

SADC-CSC's Mandate

- The Climate Services Centre was established in 1990 as the Drought Monitoring Centre. There are four such centres covering the whole of Africa, with the SADC Climate Services Centre being the only one in the SADC region. Being a SADC programme, the Centre falls within the Infrastructure and Services (I&S) Directorate.
- The **SADC Climate Services Centre** provides operational, regional services for monitoring and predicting extremes in climate condition. The Centre develops and disseminates **meteorological, environmental** and **hydro-meteorological** products. The Centre's products contribute to improved **disaster risk management** in the region, and help to ensure Member States are better prepared for weather and climate disasters, conservation and protection of natural resources.
- The Centre provides training in climate prediction for personnel in the National Meteorological/Hydrological Services (NMHSs). Training also covers the end- users in the various weather –sensitive economic sectors such as agriculture, health, energy, water resources management and transport in the region in application of the climate products and services (http://www.sadc.int/sadc-secretariat/services-centres/climate-services-centre/)

Countries responsible for:
Angola, **Botswana**, **Congo** (DR), **Lesotho**,**Malawi**, **Mauritius**, **Mozambique**, **Namibia**, Seychelles, South Africa, **Swaziland**, Tanzania, Zambia and Zimbabwe

Economic Community of Central Africa States (ECCAS) Climate Prediction and Applications Centre (ECPAC)

This centre is relatively new, having been established by the Ministerial Conference of Central Africa in April 2015. A meeting of experts in charge of meteorology of Central Africa, at a meeting in October 2014, in Ndjamena, Chad, validated the Implementation Plan of the proposed Regional Climate Centre for Central Africa. and The Heads of State and Government of Central African States at its 16th Conference in November 2014 approved the strategy and implementation plan for the establishment of a Regional Climate Centre (RCC) in Central Africa and requested the Secretary-General of the Economic Community of Central African States (ECCAS) to organize a meeting of Ministers in Charge of Meteorology for its adoption which was held in April 2015, in Yaoundé, Cameroon. The ECCAS and CEMAC, in collaboration with the AMCOMET Secretariat, the African Union Commission (AUC), WMO and other relevant stakeholders, have taken the necessary steps towards the finalization of the establishment of the Regional Climate Centre for Central Africa.

The centre is to be operational with the African Development Bank funded Satellite and Weather Information for Disaster Resilience in Africa (SAWIDRA) Project that is supposed to start in 2017.

c. Session 3: Network of Legislators for "Meteorology (Weather and Climate Services) for Sustainable Development"

The issue about the ability of weather and climate institutions to communicate with parliamentarians is of paramount importance. It is obvious that the legislators are quite aware of the obvious, in terms of hydroclimatic extreme events, leading to floods, droughts, seasonal crop failures, drop in hydropower production and others but the question of costs and socio economic values of data collection is still not well understood and appreciated. There is also a general negative impression of legislators and the public at large about weather forecasts communicated in the mass media, newspapers, radio and television.

The weather and climate service providers must realise that the general information is intended for a non-specialised audience of fairly large size. There are plenty of accounts of warnings which, although received by the authorities and the target population, have not been appropriately understood and/or acted upon. At times people do not recognise a warning as such, or they understand it but do not believe it, or they understand the "what is happening" section of a warning, but not the "what to do" section. In all such cases, what needs to be explored is a social relational failure, not a technological one.

Since politicians are elective, they normally assess the opportunity involved in any decision they take and the impacts on their constituents and electorates, especially as a consequence of the alarms not been realised. There is uncertainty in the opportunities which leads to the fact that in the process of evaluation of the risk the authorities tend to overestimate political, sociological and economic situations, which may be less important from a scientific point of view. For example, a place at high risk with a very small population density will be treated with less interest by the authorities than a place at a smaller risk, but with a very high density of inhabitants.

The relationship between weather and climate providers and operators of mass media is equally important since the mass media influences the understanding and perceptions of both the authorities and the public. The mass media publish what they term as news and not what is necessarily factual as scientists would communicate. In the final analysis, it is a communication gap between the world of scientists and the world of social actors and the mass media. The onus of closing the gap lies with meteorologists to simplify their scientific language of probabilities in order to communicate the uncertainties inherent in the prediction and forecast of weather and climatic fluxes, especially in times of hydroclimatic extreme events. Weather and climate service providers are therefore called upon to involve sociologists specialised in disasters who focus on patterns of individual and collective action and looks for similarities and differences, even independent of the origin of the hazard by linking the concepts of disaster and system vulnerability. Not only is vulnerability conceptualised as "a system's capacity to absorb and recover from the occurrence of a hazardous event" but it is also thought of as the degree of control that is (or is not) exercised over the event itself. It is equally important that NMHSs, regional centres and the continental centre (ACMAD) must be seen as the main credible sources of weather and climate information and also be more visible by taking proactive leading role during moments of hydroclimatic extreme situations, issuing regular and timely weather bulletins.

i. Legal framework for resource mobilization: National dialogue platform and "special climate fund"

Legal and legislative issues regarding the institutional arrangements for NMHSs were raised and amply discussed under a session of panel discussion led by five selected legislators. Parliamentarians, generally play a dual role as policy framers and decision makers in parliament and also serve as vehicles for change and socio-economic development both at the national and community levels. Parliamentarians are therefore interested in measures that will promote economic development in all sectors including agriculture, hydropower, water supply, health, biodiversity, ecosystems, health, environmental sustainability and others. In fact, mainstreaming meteorological and hydrological information into these socio-economic development plans through legislative institutional frameworks shall surely be accompanied by sustainable funding for NMHSs. Acquainting legislators with the necessary knowledge and information on both direct and indirect attributes of weather and climate indispensable for economic growth is in the right direction with particular emphasis on the need for continuous, regular and timely collection, archiving and dissemination of meteorological and hydrological data.

Towards autonomous NMHS Institutions

The legal frameworks for institutional set-ups of National Meteorological and Hydrological Services (NMHSs) in Africa differs from country to country. They are either services under a direct responsibility of a ministry, an agency with semi autonomous status or an autonomous authority. Every status has its corresponding sources of funding. Services are fully under national budgetary allocation through a designated ministry, covering both management and operations. Agencies normally receive budgetary subvention to cover management whilst depending upon Internally Generated Funds (IGF) for their operations. Authorities enjoy more autonomy with regard to both management and operation relying mostly on IGF. With increasing responsibilities in the face of the growing complexities of weather and climate information due to increasing climate variability and climate change, the transformation into agencies or authorities is a better option. There are persistent challenges to cost recovery of meteorological services from users, particularly from aviation and marine sectors, which is necessary to help boost the revenue base of NMHSs and the need to develop a comprehensive framework for cost recovery for all stakeholders who are users of weather and climate data, products and services. The legislators are therefore called upon to be part of this transformation process by initiating and facilitating legislative laws and institutional framework in this regard. Provision should be made for NMHSs to initiate actions to form alliances with various users of climatological information under a National Weather and Climate Platform (NWCP) that will:

- ensure NMHSs produce demand-driven products and services
- create a place for users to express their needs
- promote a Hybrid of Global Framework for Climate Services (GFCS) User-Interface and Climate Research for Development in Africa (CR4D) Institutional Collaborative Platform (ICP)
- afford NMHS to gather needs of users from platform and engage appropriate authorities to develop policies, strategies, programs and projects (involving research, operations and applications communities)
- facilitate NMHSs to co-design products and services with users

Mobilisation of Special Climate Fund

The success of the NWCP will largely depend upon availability and mobilisation of funds. Two main approaches have been identified, either through taxation or user levies. Taxes can be imposed on

vehicular and aviation fuel and also on development projects. Due to negative connotations of the word “tax” in the public eye, legislators would prefer a system of levies on selected climate products and users. The main users of products and services of NMHSs include sectors like aviation, hydropower, agriculture and irrigation, water supply, disaster management, environmental protection and many others. The proceeds of this special climate fund can then be managed as a National Climate Facility (NCF) as follows:

- provide funds to support NMHSs and Clean Development Projects
- Mobilises funds outside national budget and brings savings to national budget.
- Allocate funds for counterpart co-financing as required in international development funding (at national, regional and continental level)
- The Facility is mandated to manage funds and ensure NMHSs and beneficiaries are accountable
- The Facility is under the control of the dialogue platform
- The Facility only manages money and should not run its own programs or projects
- Staff of the Facility should include people with expertise in weather and climate
- Countries to liaise with AfDB to ensure that the Facility functions within and according to AfDB rules and regulations and to reduce effects of political changes in countries.

The continuing support rendered by some leading member countries of the World Meteorological Organisation (WMO) was well acknowledged and appreciated for the financial and/or in-kind contribution to AMCOMET and related activities in the region; and **welcome** their continued activities and support. Another source of funding is derived from the Clim-Dev Africa Special Fund (CDSF), hosted at the African Development Bank (AfDB), which pools the resources mobilized from donors to finance climate-resilient development programmes across Africa, including the generation and wide dissemination of climate information. It is hoped that the AUC would continue the process to facilitate collaboration between AMCOMET, the African Ministers’ Council on Water (AMCOW) and the African Ministerial Conference on Environment (AMCEN) on converging issues related to the sustainable development of the continent.
These tasks have set the ball rolling for the dialogue between weather and climate data and information providers and legislators. The legislators present at the workshop have decided to serve as the nucleus of the network to be known as Network of Green Legislators (NGL) and pledged to amplify it by attracting other parliamentarians, especially those already identified with environmental groups.

3. Conclusions and Recommendations

The high level of deliberations and the active exchange of ideas achieved during the present workshop has broken the myth surrounding the intricate problem of communication between the scientific world of meteorologists and the socio political world of parliamentarians. The legislators were acquainted with the necessary knowledge and information on both direct and indirect attributes of weather and climate indispensable for economic growth which was well received and appreciated with particular emphasis on the need for continuous, regular and timely collection, archiving and dissemination of meteorological and hydrological data. The key role of early warning system is to provide a complex of predictions and forecasts of an extreme event with the aim of enhancing the forecast lead time to obtain socially optimal time for disaster mitigation. The

effectiveness of such emergency plans will largely depend on the gains to be made for enhancing the lead time of real time forecast which will allow emergency preparedness plans and strategies to be put in action before the arrival of the hazard.

There is the urgency to formulate adaptation strategies for infrastructure plans and investments to reduce the risk of climate variability and change in order to integrate disasters of weather and climate origin with socio-economic development plans of African countries susceptible to severe impacts of climate variability and change.

It is clear that authorities and decision makers need information and tools to formulate and facilitate the enactment of legislative policies and strategic frameworks for adaptation plans responsive to extreme climatic conditions. The success in guaranteeing continuous and reliable data and information depends on the extent at which weather and climate institutions would be funded for increasing human, institutional and technological capacities commensurate with the growing complexities and demands of the changing climate.

Finally, a nucleus of legislators has emerged as a network to kick start the much called for Network of Green Legislators, giving the hope that the needs and aspirations of meteorological and hydrological institutions would receive better considerations by African parliamentarians in particular and the authorities in general.

4. Recommendations of the Workshop on "Weather and Climate Information – Resource for Development"

December 12-13, 2016

The workshop on "Weather and Climate Information – resource for Development" organized for African Legislators by The African Centre of Meteorological Applications for Development (ACMAD) and the Ghana Meteorological Agency (GMet) in the framework of the African Development Bank (AfDB) funded Institutional Support to African Climate Institutions Project (ISACIP) in Accra, Ghana from 12-13 December 2016;

Affirms that weather and climate information, fundamental as they are to development, is a resource, by its adequate and equitable access, will greatly enhance the achievements of global targets (i.e. policy initiatives) such as integrated African Strategy on Meteorology (Climate and weather services), the Paris agreement, the African regional strategy for Disaster Risk Reduction and its programme of action, the Sendai Framework for disaster risk reduction, the draft Africa Climate Change strategy, the High level work programme on Climate Action in Africa, and the SDGs and AU Agenda 2063.

Is concerned that phenomena such as climate change and variability as well as human factors, population growth, competition for water and pollution increasingly threaten the sustainability of weather and climate sensitive sectors in Africa and hence the livelihood of many poor living in Africa, especially women and children

Nevertheless, is convinced that dedicated programmes, such as ClimDev-Africa that focus on building and expanding capacity in meteorological sciences and related technologies will take the necessary measures to mitigate the human and economic losses associated with the lack of appropriate use of weather and climate information:

WE, THE PARTICIPANTS, HEREBY CALL ON DECISION-MAKERS AND STAKEHOLDERS TO IMPLEMENT THE FOLLOWING RECOMMENDATIONS AND ACTIONS:

The workshop recommends that:

Parliaments of Africa:

1) There should be a legal framework for service charges on relevant services (e.g. Aviation, Ports and Harbour, Transportation) and development projects among others, to generate funds ("special climate fund") under a National Climate Facility (NCF) to support the NMHSs and associated institutions
2) There should be a legal framework to facilitate the establishment of public-private partnerships through relevant legal frameworks. This will improve the communication of weather and climate information and services for development
3) Existing declarations be implemented to ensure the NMHS are transformed from services to agencies. This is to facilitate cost recovery, human capacity development, autonomy in financial decisions, modernization of the NMHSs, among others

Legislatures at the workshop:

1) Weather and climate groups (network of Green legislators) be established (probably within existing environmental groups in parliaments) at national, regional and continental levels
2) The network of parliamentarians established at this meeting follow up on existing declarations (e.g. Nairobi April 2010 regarding AMCOMET) to ensure the appropriate involvement of Heads of State.

ACMAD and NMHSs:

1) National dialogue platform (hybrid of Global Framework for Climate Services (GFCS) User-Interface and Climate Research for Development in Africa (CR4D) Institutional Collaborative Platform (ICP) be created. This is to facilitate interaction among stakeholders that will enable the National Meteorological and Hydrological Services (NMHSs) provide demand driven services
2) the NCF (i.e. organism to manage the fund) will not run any programs or projects. The NCF only receives the funds and disburses these funds according to programs and projects.
3) NMHS: Some of the funding under the NCF should be set aside to provide co-financing that attracts international development funding from national to continental levels. This is in response to emerging challenges from donors. For example, Global Monitoring of Environment and Security (GMES) and Africa
4) NMHS: The community should also be sensitized about the importance of meteorology
5) NMHS: The NMHSs develop their own Strategic Plans with the help of the World Meteorological Organization template
6) NMHS: Countries endeavor to pay their contributions to ACMAD to enable ACMAD play its role on the continent
7) Climate related projects should support the implementation of regional and global targets, such as the integrated African Regional Strategy for Disaster Risk Reduction and its programme of action, the Sendai Framework for Disaster Risk Reduction, the Draft Africa Climate Change Strategy, the High-Level work on Climate Action in Africa, the Sustainable Development Goals (SDGs), and the AU Agenda 2063.
8) ACMAD: ACMAD makes a presentation at the AU Heads of State Summit and other sub-regional summits, including sensitization of the Pan-African Parliament
9) ACMAD: The report of this workshop be circulated among various parliaments
10) ACMAD: ACMAD should support NMHSs to evaluate their needs with appropriate costs. This should then be submitted to parliament.
11) ACMAD should use the network created here to get in touch with influential Heads of State who will be ambassadors of this initiative
12) ACMAD: There should be a follow up within one year, to assess the extent to which recommendations have been implemented
13) ACMAD: ACMAD should identify best practices in other countries where their NMHSs get a significant level of funding and make the information available to other NMHSs. Examples of countries with strong NMHSs include Morocco, Nigeria, Kenya, Senegal and South Africa.

African Development Bank:

1) Financial Institutions (e.g. African Development Bank and ClimDev Special Fund) should expand or improve their engagement of required technical expertise from the weather and climate community to strengthen their climate related programs and projects formulation and management

Acknowledgements

The workshop wishes to thank the African Development Bank and the government of Ghana for their support in organizing this workshop.

C. AGENDA OF ISACIP WORKSHOP

SENSITIZATION WORKSHOP FOR LEGISLATORS

"WEATHER AND CLIMATE INFORMATION, RESOURCE FOR SUSTAINABLE DEVELOPMENT"

------12th -13th December 2016 (Accra-Ghana)

N°	Time	Subject / Title of presentation	Presenter / comments
DAY1: OPENING CEREMONY and ORIENTATION of the WORKSHOP			
1	0900-0930	OPENING CEREMONY:	Ghana Authorities/ ACMAD
2	0930-1000	Group photo and health Break and Setting the Working Groups	
3	1000-1015	Sensitization workshop within ISACIP: Workshop objectives	B. Lamptey (ACMAD)
DAY 1: Session 1: Sensitization on weather and climate information as resources for development **Co-Chair/Moderator:** UNECA **Rapporteur: UMA**			
4	1015-1030	Keynote address: How climate and weather are used in different sectors (Use in rainfed, irrigation) – Including climate variability and projections, Extreme events due to climate change	WMO
5	1030-1045	Economic benefit of meteorological services (Loss and Damage, Recovery cost a lot, the economic benefits - Technique developed by World Bank – software available	Prof. Kwabena Anaman
6	1045-1100	Impacts of Extreme Events/climate change on different sectors (Agric, Water, DRR, Infrastructure)	WMO
7	1100-1115	Discussion/Recommendation – National Special Climate Fund	
8	1115-1130	The role of climate institutions (ACMAD, ICPAC, SADC-CSC, AGRHYMET, ECPAC) in the production of Climate information and services for development.	ACMAD
9	1130-1145	Role and status of NMHSs	Dauda Konate/
10	1145-1245	Countries Experiences:	
11	1245-1300	DISCUSSION/Recommendation	
12	1300-1430	LUNCH BREAK	
13	**DAY 1: Session 2: Climate Variability and Climate Change (Adaptation)c** **Chair/Moderator:** AFDB **Rapporteur: SADC**		
14	1430-1445	Keynote: AUC – Global Targets (e.g. Sendai, CoP21, SDGs, Agenda 2063) – Climate Financing	
15	1445-1500	Mainstreaming Climate Variability and Climate Change Issues into Africa's Development Policies and Practices.	Prof. John Muthama
16	1500-1600	Countries Experiences –	

17	1600-1615	DISCUSSION/Recommendations	
18	1615-1630	Health Break	
19	1630-1645	Presentation on variability (example of seasonal forecast) /CR4D	
20	1645-1715	Summary/Discussion	
21		END OF DAY Cocktail (venue to be determined)	
▪ **DAY2: <u>Session 3: Network of Legislators for "Meteorology (Weather and Climate Services) for Sustainable Development"</u>** **<u>Chair/Moderator:</u>** Hon. Wilber Ottichillo (Kenya)/Luganda **<u>Rapporteur: IGAD</u>** ▪			
22	0900-0915	Recap of Day 1	
23	0915-1015	- Introduction to the Panel Discussion - Panel discussion: Role of parliament in setting up an automous NMHSs	
24	1015-1030	- HEALTH BREAK	
25	1030-1130	Introduction to Panel Discussion Panel Discussion: Legal framework for resource mobilization: National dialogue platform and "special climate fund"	
26	1130-1245	Summary/Conclusions and recommendations	
27	1245-1300	Closing Ceremony/Way forward	
28	1300-1400	LUNCH BREAK	
29		END OF DAY	

D. List of Participants

Workshop for Legislators on Weather and Climate information

12th – 13th December 2016

ACCRA – GHANA

ACMAD

Liste de presence
Workshop for Legislators on Weather and Climate information
12 Décembre 2016
ACCRA GHANA

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