WMO Submission on National Adaptation Plans (NAP)
MARCH 2014

About WMO

The World Meteorological Organization (WMO) is a specialized agency of the United Nations. It is the UN system's authoritative voice on the state and behaviour of the Earth's atmosphere, its interaction with the oceans, the climate it produces and the resulting distribution of water resources. WMO in collaboration with its 191 Member States comprising a global network of National Meteorological Hydrological Services (NMHSs), has a vast reservoir of expertise, knowledge, data and tools among its Members, Programmes, Technical Commissions, Expert Teams and partner organizations, capable of bringing strong scientific and technical capability along with local, regional and global knowledge that offers authoritative and targeted analyses for consideration by Parties and the SBSTA. Contributions could include providing expert advice, guidelines, technical inputs to workshops and seminars and also taking on operational responsibilities for the implementation of some components of specific activities.

Adaptation Activities in WMO

Adaptation to climate change and its adverse effects is of high priority for WMO. Developing countries, especially the Least Developed Countries (LDCs) and Small Island Developing States (SIDS) are highly vulnerable to impacts of climate change and climate variability. Their needs for adaptation, as is the case for all countries, should be coordinated with social and economic development in an integrated manner with a view to avoiding adverse impacts. It has also been recognized that countries are incorporating local and indigenous knowledge in their activities related to impacts, vulnerability and adaptation to climate change, with assistance from relevant international and regional organizations. WMO assists Member States, in particular the developing countries including LDCs and SIDS, to improve their understanding and assessment of impacts, vulnerability and adaptation and to make informed decisions on practical adaptation actions and measures to respond to climate change on a sound, scientific, technical and socio-economic basis, taking into account current and future climate change and variability.

Examples of WMO Initiatives

Global Framework for Climate Services (GFCS)

What is the GFCS:

The GFCS is a global partnership of governments and organizations that produce and use climate information and services. It seeks to enable researchers and the producers and users of information to join forces to improve the quality and quantity of climate services worldwide, particularly in developing countries.

The goals of the GFCS are:

- Reducing the vulnerability of society to climate-related hazards through better provision of climate services;
- Advancing the key global development goals through better provision of climate services;
- Mainstreaming the use of climate information in decision making. Promoting better uptake, understanding and awareness of the need for climate information and climate services; and demonstrating the value of the services in socio-economic, safety and sustainability terms;

- Strengthening the engagement of providers and users of climate services. Building relationships between providers and users of climate services at both the technical and decision-making levels; and
- Maximizing the utility of existing climate service infrastructure. Improving coordination, and strengthening and building this infrastructure where needed.

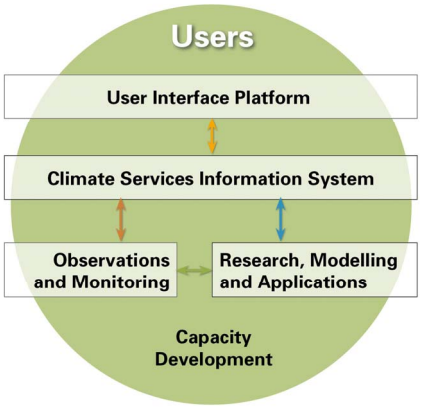
Why invest in Climate Services?

Climate services enhance development opportunities and reduce vulnerability. Climate-sensitive developing countries stand to gain the most from better climate information but are often precisely where climate services are weakest. The Framework will give priority to capacity building in these countries. Climate services are critical to preparing for climate change. Good management of climatic risks today is the foundation for managing the changed climatic risks of tomorrow. Adaptation, renewable energy, energy conservation and mitigation actions all depend on good climate information and climate services.

Climate services can improve the lives of billions of people. The widespread influence of climate and diverse uses of climate information across public policy and business decision making means that even small improvements in climate services can leverage enormous impacts, saving and improving lives. The Framework has a unique and powerful mandate to strengthen and mobilize all those with relevant interests - governments, expert organizations and user organizations to achieve synergies and leverage in climate services.

What are the Pillars of the GFCS?

- ***User Interface Platform*** — provide ways for climate service users and providers to interact and improve the effectiveness of the Framework and its climate services
- ***Climate Services Information System*** — produce and distribute climate data and information according to the needs of users and to agreed standards
- ***Observations and Monitoring*** – develop agreements and standards for generating necessary climate data.
- ***Research, Modeling and Prediction*** — harness science capabilities and results to meet the needs of climate services
- ***Capacity Building*** — support the systematic development of the institutions, infrastructure and human resources needed for effective climate services.



What are the Priority Areas of the GFCS?

The GFCS has developed four exemplars, or models, to illustrate how climate services can support decision-making in priority sectors. Building on the broad concepts of the GFCS, the exemplars provide detailed descriptions of how climate services can work in practice. They explore how to design a climate service, engage users and partners, and mobilize resources.

1. Agriculture and food security: Food security is a major concern in an era of growing populations. Agriculture is vulnerable not only to market fluctuations but to climate variability and change and natural hazards. http://gfcs.wmo.int/docs/GFCS_food_security_flyer_en.pdf

2. Disaster risk reduction: Most natural hazards are caused by weather and climate. User-friendly climate services can help countries and communities build greater resilience against floods, droughts, storms and other hydro-meteorological risks. http://gfcs.wmo.int/docs/HLT_DRR_EN.pdf

3. Health: Climate variability and climate change have important repercussions on public health. Temperature and moisture conditions influence the spread of contagious diseases while extreme events cause injury and death. GFCS examines how demand-driven climate services can empower the health community to save lives. http://gfcs.wmo.int/docs/HLT_health_EN.pdf

4. Water: Water is vital for life, but too little or too much of it can also threaten societies and economies. The amount and availability of water is strongly influenced by climate variability and change. As this exemplar makes clear, seasonal climate outlooks and other climate services and products can greatly improve water supply management. http://gfcs.wmo.int/docs/GFCS_water_community_flyer_en.pdf

Examples of two recent GFCS projects in LDCs:

The implementation of GFCS is now well underway. The "Climate Services Adaptation Programme in Africa", launched on 15 October 2013, is the first multi-agency initiative to be implemented under GFCS. It will help build integrated frameworks to develop climate services for food security, nutrition and health, as well as disaster risk reduction in Tanzania and Malawi. The programme received funding from Norway (USD 10 million) under an agreement signed on 21 November 2013 in Warsaw. "Kick-off" meetings have taken place in February 2014 in, both, Tanzania and Malawi. The meetings brought together project partners to initiate detailed activity planning at country levels, launch the process for establishing the frameworks for climate services at national level and set-up the national structures required for management of the programme. The Climate Services Adaptation Programme in Africa is implemented by seven partner organizations: WMO; the CGIAR Research Programme on Climate Change, Agriculture and Food Security (CCAFS); the Centre for International Climate and Environmental Research – Oslo (CICERO); the Chr. Michelsen Institute (CMI); the International Federation of Red Cross and Red Crescent Societies (IFRC); the World Food Programme (WFP); and the World Health Organization (WHO).

In the Pacific, the Caribbean, South Asia and the Arctic, GFCS is being implemented through a programme funded by a grant of CAD 6 138 000 from Canada. The "Programme for implementing GFCS at Regional and National Scales" has as main objective to enhance resilience in social, economic and environmental systems to climate variability and change. As a first step, a Regional consultation is being planned for Small Island Developing States in the Pacific from 31 March to 4 April 2014 in the Cook Islands. An agreement was signed on 22 February 2014 by the Secretary-General of the World Meteorological Organisation (WMO), Michel Jarraud, with the Haitian President, Michel Martelly, to improve weather, climate and hydrology forecasting within the framework of the Canadian funded project. The project will be coordinated and managed by WMO and directly contributes to GFCS implementation.

Regional Climate Outlook Forums (RCOFs) and Regional Climate Centres (RCCs)

With the establishment of the Climate Information and Prediction Services (CLIPS) project in 1995, WMO has initiated early efforts to set up specific institutional frameworks with appropriate stakeholders taking the lead, to address relevant climate change issues at the local and sector levels. The Regional Climate Outlook Forums (RCOFs), a concept conceived in 1997 with sustained support by WMO as part of CLIPS activities, need special mention. RCOFs constitute an important vehicle for developing countries In providing regional climate outlooks for the next season and beyond, and for developing a consensus product from amongst the multiple available

individual predictions. RCOFs stimulate the development of climate capacity in the NMHSs and facilitate end-user liaison and provide effective platforms to strengthen networking of climate Information providers as well as users to deal with climate related matters of common Interest, generate decisions and activities that mitigate the adverse impacts of climate variability and change and help communities to build appropriate adaptation strategies. There is a great potential for the regional climate activities that currently take place under RCOFs and through CLIPS training to expand, through the actions of the WMO regional associations and the NMHSs (facilitated by the Secretariat) to expand the use of currently available tools to more countries and to include information on climate change scenarios assembled by World Climate Research Programme (WCRP) such as climate projections created for the IPCC Fifth Assessment Report (AR5). This would enable NMHSs to more effectively contribute to their national communications to the UNFCCC and to develop or enhance their dialogue with users of climate information on climate risks and vulnerability, and would also support improved regional coordination on climate matters, standardization of tools and increased evaluation (feedback) on model outputs. To facilitate regional climate operations including regionally coordinated support to RCOFs as well as NMHSs, WMO has established a number of formally designated Regional Climate Centres (RCCs) around the world, which perform mandatory functions of long range forecasting, climate monitoring, climate data and training, along with highly recommended functions including climate change scenario development and provision, research, applications, etc. This evolution from the current state (ability in some sub-regions to establish RCCs and undertake RCOFs) would require technology transfer (to enhance computational capability) including hardware, software, models and data storage devices; stable and high-speed Internet; ability to download data through the Internet; trained climate experts; climate services toolkits; research.

Climate Data Management and Observations

Lack of adequate and reliable climate data is considered to be a major constraint in developing an accurate understanding of the current and future climate variability and change, particularly in the developing and least developed countries. NMHSs, through the WMO, coordinate their efforts in capacity building, training, research and development to address this gap and provide reliable climate observations, which can be transformed into useful products for stakeholders to make use in the development of their adaptation strategies. NMHSs can contribute significantly through the development and use of Modern Climate Data Management Systems (CDMSs) and through *'rescue'* of historical records that are at risk of deterioration, in order to secure complete and safe long-term climate records. Improved climate observations are vital to address climate related issues. Through its various programmes WMO can provide a platform for a coordinated global framework for obtaining climate data needed for climate change detection and its impacts on vulnerable sectors, research, policy information and national economic development. These include networks measuring the classical Essential Climate Variables as well as the chemical variables greenhouse gases and aerosols, as recognized by the Global Climate Observing System (GCOS).

Climate Modeling, Scenarios and Downscaling; including CORDEX

WMO spearheads global efforts to bridge the existing gaps between developed and developing countries in their understanding of climate change impacts through capacity building and regular updates of occurrence of extreme events and associated damages. In particular, the application of the regional climate models in developing countries need adequate local observational data for model evaluation, and regional expertise to diagnose and interpret the simulated regional features. Regional climate models provide more useful local information needed by policy makers and planners on adaptation policies and to enhance the capacity of communities to cope with the future. Since fine resolution climate change information for use in impact studies can also be obtained via sophisticated statistical downscaling methods, WMO initiates coordinated efforts to use these methods to develop and implement useful and plausible regional scale climate scenarios. The World Climate Research Programme (WCRP) is leading a major worldwide effort, the *Coordinated Regional Climate Downscaling Experiment (CORDEX)* to address the provisioning of regional climate information for decision-making. The CORDEX framework promotes the evaluation and improvement of Regional Climate Downscaling (RCD) products, and facilitates their integration into the Global Framework for Climate Services (GFCS), and their use in Vulnerability,

Impact and Adaptation (VIA) applications. Building on the initial success in Africa, CORDEX is now developing regional research capacity over all land regions of the world and the Arctic, in close collaboration with relevant stakeholders. Some of the CORDEX regions are already self-organizing; however, in a number of regions of the world, access to reliable regional climate change information is still extremely limited. It is in those vulnerable regions that the collaborations developed through CORDEX are expected to deliver the largest benefits.

African Ministerial Conference on Meteorology (AMCOMET)

In April 2010, the First Conference of Ministers Responsible for Meteorology in Africa established the African Ministerial Conference on Meteorology (AMCOMET) as a high level mechanism for the development of meteorology and its applications in Africa. African Ministers recognized that weather and climate are central to the socio-economic development of any country, and as such deserve strong support at the highest possible level of government. Ministers further recognized that sound governance of the science of meteorology and its related applications must be streamlined in national development agendas to promote cooperation, security, socio-economic development and poverty eradication on a pan-African level. By establishing AMCOMET, the Ministers committed themselves to:

- Strengthen National Meteorological Services by providing them with the resources and appropriate institutional frameworks to enable them to execute their functions, particularly in observations, forecasting and applications;
- Recognize the role of meteorological services as a fundamental component of the national development infrastructure and ensure that meteorological information is a permanent parameter and feature in national current and future plans, programmes and policies in the key sectors of the country's economy;
- Regard national meteorological services as strategic national assets which contribute to national security, principal of which are transport, food, water, energy and health in addition to being vital to sustainable development particularly poverty reduction efforts, climate change mitigation and adaptation and disaster risk reduction; and
- Ensure that all sub regions of the continent are active and are adequately resourced.

The Integrated African Strategy, through its Strategic Pillars, underscores the necessity of increased political support and recognition of NMHSs, the urgent need for enhanced weather and climate service delivery, the increased support for the provision weather and climate services for climate change adaptation and mitigation, and the strengthening of partnerships with relevant institutions and funding mechanisms. Furthermore, it will provide a key support to the implementation of the Global Framework for Climate Services (GFCS) in Africa, including its priority areas, namely, agriculture and food security, health, water resources and disaster risk reduction.

Strategic Pillars of AMCOMET

- **SP1:** Increase Political Support and Recognition of NMHSs and related WMO Regional
- Climate Centres
- **SP2:** Enhance the Production and Delivery of Weather and Climate Services for Sustainable Development
- **SP3:** Improve Access to Meteorological Services in particular for the Marine and Aviation Sectors
- **SP4:** Support the Provision of Weather and Climate Services for Climate Change Adaptation and Mitigation
- **SP5:** Strengthen partnerships with relevant institutions and funding mechanisms

Conclusion

WMO commits itself to facilitate dissemination and use of knowledge on applications of climate science for adaptation purposes and will make every effort to enhance partnership among stakeholders in this activity. WMO's priorities in the face of such challenges are clear. They are to

strengthen scientific and technical programmes, to address crosscutting issues such as adaptation to pursue strategic alliances and partnership in all sectors and to redouble efforts to upgrade the capacity of networks and mobilize resources which are needed to operate ably.

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