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A NEW ERA OF CLIMATE SERVICES

Outlining WMO's new strategy, including the proposed Global Framework for Climate Services, **Jeremiah Lengoasa** highlights their efforts in risk management and adaptation to climate change

Since we last interviewed World Meteorological Organization (WMO) many things have evolved and changed in the organisation's strategy. Could you share with *International Innovation* how WMO has developed and what new components have been introduced?

The Sixteenth World Meteorological Congress approved the WMO Strategic Plan for the period 2012-15. The approval of the Plan marked the second phase in the implementation of Results-based Management (RBM), as the fundamental concept for managing the planning, implementation and performance assessment of WMO's programme activities. The ultimate goal is to marry WMO Members' needs with advances in science and technology that enable warning to the public of the risks associated with high impact extreme weather and climate events. Such warnings can help save lives and property, and enhance quality of life

The four building blocks of WMO RBM Framework are WMO Strategic Plan (SP), WMO Operating Plan (OP), WMO Results-based Budget (RBB) and WMO Monitoring and Evaluation (M&E) System. The WMO strategic planning process begins with the integration of Members' input into a high-level planning document that defines the global societal needs, strategic thrusts, strategic priorities and expected results. The five strategic priorities for the period 2012-15 are the Global Framework for Climate Services (GFCS), WMO Information System/WMO Integrated Global Observing System (WIS/WIGOS), Disaster Risk Reduction (DRR), Aviation Meteorological Services, and Capacity Development for developing countries.

The WIS is being designed to dramatically extend WMO Members' ability to collect and disseminate data and products. What will this mean for its users and how will this improve their research?

Observational datasets are managed for two main purposes: (1) numerical weather prediction – where datasets that are routinely exchanged on an hourly basis through communication networks are processed, quality checked and used with weather simulation models by global centres in Europe, Asia, the U.S. and elsewhere; (2) climatology – where the observations are further quality checked and archived, or further exchanged through WMO and other networks for research, analysis and other national purposes.

Through the World Climate Programme (WCP), WMO coordinates data management requirements and related hardware and software technology (www.wmo.int/pages/prog/wcp/wcdmp/CDM_3_1.php).

The ongoing long-term challenge is to accelerate rescue and digitisation of old climate data which is at risk of loss in paper format, and to put these datasets in modern archiving systems. A major WMO priority is to assist developing countries to ensure all datasets are safeguarded, digitised and made readily available for application and research. For example, the NOAA National Climate Data Center (www.wmo.int/pages/prog/wcp/wcdmp/CDM_2.php) collects data through the WMO communication network and the long-term data rescue programme, and also provides a global archiving facility (www.ncdc.noaa.gov/oa/climate/cdmp/cdmp.html). WIS is a major effort to facilitate, archive, access and distribution of data and information made available to users through its Members. This system will serve as a solid foundation and a major contribution of WMO to the GFCS.

Could you expand on WMO's gamut of climate services? What added value are these bringing to the international community? What further developments in this area are set to take place?

In 2009, delegates from over 150 countries and 70 organisations attending the Third World Climate Conference unanimously agreed to establish the GFCS. These Services facilitate the coordination to enable

producers, researchers and user organisations to join forces in lifting the quality and volume of climate services worldwide, and particularly for developing countries.

The added value will be better climate risk management and adaptation to climate change. In practical terms, the GFCS will facilitate the availability of such climate information and its effective use by converting information and knowledge in support of decisions and action. It attempts to narrow the gap between the needs of climate services and their current provision – especially in climate-vulnerable developing countries. It will translate scientific advances into tools for action on the ground through downscaling global knowledge to fit national needs.

To ensure effective development and application of climate services, there is a requirement to strengthen existing capacities and build synergies to implement the following pillars of the Framework:

- User Interface Platform (UIP) – a mechanism that will provide ways for climate service users and providers to interact to facilitate the identification of user needs, provision of feedback by users on the quality and usefulness of climate services being provided, improve literacy of users on climate services and evaluate the overall effectiveness of the Framework
- Climate Services Information System (CSIS) – to facilitate the production and sharing of climate data, monitoring prediction and information products according to the needs of users and agreed principles
- Observations and Monitoring – to facilitate the observation and monitoring of critical variables and the development of standards and agreements for generating necessary climate data
- Research, Modelling and Prediction – to advance the knowledge and predictability of the climate system and facilitate the harnessing of science capabilities and results to meet the needs of users in climate services
- Capacity Development – to support systematic development of institutions, infrastructure and human resources needed for effective climate services

In terms of meeting the significant challenges posed by climate variability and change, such as humanitarian disasters and economic setbacks which can result from climate extremes, how are WMO climate services helping to mitigate these?

Climate services will help countries and organisations in long-term planning (eg. to minimise the impacts of a potential drought through the use of seasonal forecasts), emergency preparedness and response to extreme events through the use of early warning systems. Climate services will also facilitate risk assessment critical for long-term planning and emergency preparedness and response. Climate information to be provided by GFCS will support land use planning, infrastructure design and siting of critical infrastructure such as hospitals, schools, humanitarian assistance centres.

How will GFCS strengthen the provision and use of climate predictions, products and information worldwide?

On the one hand, GFCS will be based on a solid set of observations, and sound climate research. Additionally, it will feature operational climate services around the world, through the CSIS. Most importantly, the GFCS will position users front and centre through the UIP, so that its observations, research and operational climate activities can increasingly respond to user needs, and provide the services users require for climate risk management and adaptation to climate change.

This will bring value to the international community through better networking between, and coordination of, the activities of the providers, increased communications between providers and users, and ultimately, improved use of climate information in climate-sensitive decisions. GFCS will foster the closing of gaps in observing systems that prevent effective climate services at national scale. The services will focus research on improving prediction and projection models to respond to user needs, and increasingly in interdisciplinary science (eg., agrometeorology, climate and health studies). Moreover, it will build capacity for climate services in countries, in National Meteorological Hydrological Services (NMHS) and in other relevant organisations; focus on helping the users increase their knowledge; and access and apply climate information and products.

To what extent do these services differ at global, regional and national levels?

At the global level, the Framework will focus on coordinating the provision of global climate monitoring and prediction products, coordinating and supporting data exchange, major capacity development initiatives, and establishing and maintaining standards and protocols. Global producing centres will receive and process nationally generated data and produce and distribute data and products to regional climate centres and NMHS/ national climate centres so that those centres can integrate that information into their forecasts and thus provide better regional and national climate services.

At the regional level, the Framework will support multilateral efforts to address regional needs, for example, through regional knowledge and data exchange, infrastructure development, research, training and the provision of services regionally to meet agreed requirements. Regional climate centres will play a central role in furnishing regional-scale climate information and products, including those provided through the Regional Climate Outlook Forums (FCOFs), and may also cater for some national needs where appropriate. Some of these regional centres already exist but still need strengthening, with others soon to be set up and some still in the planning stages.

At the national level, the Framework will focus on ensuring access to data and knowledge products, tailoring information to user requirements, ensuring effective routine use of information in planning and management along with developing sustainable capacities in these respects.

To promote interaction between your members to communicate, how is the User Interface Platform (UIP) improving information transfer for researchers? What are some of the benefits you have seen? Are policy makers listed among its users?

Policy and decision makers are very important users of climate information. They need to understand the climate features of their area, and how these are likely to evolve, for a host of practical decisions. Climate-informed policy and decision makers are also more likely to protect and build the climate infrastructure and talent-pool needed to provide them with decision-support information.

We envision an active dialogue among the providers and users of the information throughout the entire process to ensure timely, effective and proper use of the climate information in any decision or policy matter. The best examples of such a dialogue and use of science-based information are international policy for activities such as the mitigating adverse impacts of ozone depleting substances. This leads to recovery of ozone layer.

GFCS UIP should create interaction with users that will identify their needs for information and products. It will not be feasible at this time simply to pull information and products 'off-the shelf' for all needs. In some cases, additional research work will be needed to support user needs, and the GFCS research community will be responsible for taking on the challenge. An example would be user confidence in the products they are applying, and for seasonal prediction in regions outside the tropical belt, prediction skill is not of a sufficient standard – climate research is working on improvements to models and knowledge to improve on this.

Regarding observations and monitoring, is there still more to be done to ensure that climate observations are accurate? Are they currently meeting the needs that climate services require?

There are still significant gaps in observations that can be summarised as follows:

- Significant shortcomings in the quality, frequency, reliability and accuracy of reporting from many stations to national and international centres, with some stations being silent
- Problems associated with integrating remotely-sensed data with more traditional climate datasets
- Inadequate availability of information about changes in instrumentation and location, which is important for adjusting to any artificial changes in climate measurements
- Some observations (for example, in the terrestrial, ocean and satellite domains) are part of research-based funding and the activities have not yet been moved to a more permanent operational environment
- Satellite monitoring of the Earth is still incomplete, even with considerable developments in recent years. In addition, climate monitoring from space does not yet have an internationally agreed architecture
- The deep Ocean is not satisfactorily observed as yet. Recovering the historical Ocean dataset is also incomplete
- Gaps exist in the historical climate observations as a result of inconsistent observations or outdated recording systems or formats. There is scope for improving these historical records by techniques such as digitisation, data rescue and data homogenisation
- To achieve the full potential and benefits of climate services, other scientific data such as air quality, ecological and biological data are also required

Finally, can you expand on the approach taken by the Capacity Building component of the GFCS? What improvements are there still to be made as regards infrastructure, as well as the development of the necessary institutions?

The capacity development component of the Framework will focus on strengthening existing capacities in the areas of governance, management, human resources development, leadership, partnership creation, science communication, service delivery, resource mobilisation and infrastructure that are needed to enable all countries to manage climate risk effectively. On the operational side, it will focus on establishing and strengthening Regional Climate Centres, which supported by global producing centres for the provision of climate services at national level.

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