WMO OMM

World Meteorological Organization
Organisation météorologique mondiale
Organización Meteorológica Mundial
Всемирная метеорологическая организация
المنظمة العالمية للأرصاد الجوية
世界气象组织

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

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Ref.: 26875/2018-L0 LCP

Nuestra ref.: 24585/2018/CLW/CLPA/CCA/UNFCCC-COP24/2nd 1 de octubre de 2018

Anexo: 1 (disponible en inglés solamente)

Asunto: Reseña de orientación política sobre la contribución de la Organización Meteorológica Mundial al 24º período de sesiones de la Conferencia de las Partes en la Convención Marco de las Naciones Unidas sobre el Cambio Climático (CMNUCC), así como al 14º período de sesiones de la Conferencia de las Partes en calidad de Reunión de las Partes en el Protocolo de Kyoto y a la segunda parte del primer período de sesiones de la Conferencia de las Partes en calidad de reunión de las Partes en el Acuerdo de París (Katowice, Polonia, 3 a 14 de diciembre de 2018)

Finalidad: Solicitar a los representantes de los Servicios Meteorológicos e Hidrológicos Nacionales que tomen nota de la reseña de orientación política adjunta e indiquen de qué manera la Organización Meteorológica Mundial puede brindar más apoyo a esos Servicios para su participación en los procesos de la Convención Marco de las Naciones Unidas sobre el Cambio Climático

Estimado señor/Estimada señora:

A medida que se aproximan las fechas del 24º período de sesiones de la Conferencia de las Partes (CP 24) y de las reuniones conexas, me complace compartir con usted más información que puede serle útil al considerar su participación y la de su delegación nacional en esas reuniones.

En mi carta circular de fecha 13 de agosto de 2018 le informé de que la Organización Meteorológica Mundial (OMM) y sus órganos copatrocinados organizarían eventos paralelos, estarían presentes en las zonas de exposición y participarían en distintas áreas temáticas durante la CP 24. Asimismo, le proporcioné una actualización y un resumen de las decisiones relacionadas con la comunidad de la OMM que adoptaron órganos integrantes de la Convención Marco de las Naciones Unidas sobre el Cambio Climático (CMNUCC), como el Órgano Subsidiario de Asesoramiento Científico y Tecnológico (OSACT) y el Órgano Subsidiario de Ejecución (OSE). Me complace enviarle adjunta una reseña de orientación política en la que se detalla además el mandato de la OMM en el proceso de la CMNUCC con miras a poner de relieve la contribución de la ciencia y de los servicios climáticos a la ejecución del Acuerdo de París y de los Objetivos de Desarrollo Sostenible (ODS), estrechamente relacionados.

La presente reseña de orientación política contribuye a que los Servicios Meteorológicos e Hidrológicos Nacionales (SMHN) comprendan el papel que desempeñan en el contexto de las cuestiones relativas al cambio climático mundial y destaca la importancia de los mecanismos institucionales como el Marco Nacional para los Servicios Climáticos a través de los cuales pueden contribuir de manera más eficiente y holística a las actividades de adaptación y mitigación a nivel nacional. Esas contribuciones deben basarse en pruebas científicas, que se sustenten en un análisis y unas conclusiones basados en datos de alta calidad.

A los Representantes Permanentes (o Directores de los Servicios Meteorológicos o Hidrometeorológicos) de los Miembros de la OMM

copias: Asesores hidrológicos de los Representantes Permanentes

Quisiera animarle a que participe en la CP 24 en calidad de miembro de su delegación nacional para reforzar el papel que desempeñan los SMHN como contribuyentes al proceso de la CMNUCC. Si bien la OMM no podrá brindar asistencia financiera para su participación en la CP 24, le agradecería que me enviara sus sugerencias sobre cómo puede la Organización ayudar a su Servicio para que brinde apoyo a su Gobierno en la aplicación de los procesos de la CMNUCC y del Acuerdo de París. Si usted o alguien de su Servicio tiene previsto asistir a la CP 24, le agradecería que informase de su asistencia a la señora Nadia Oppliger (noppliger@wmo.int) a más tardar el **2 de noviembre de 2018**. En caso de que desee hacer alguna consulta, no dude en ponerse en contacto con el señor Amir Delju (adelju@wmo.int).

Le saluda atentamente.

(P. Taalas)
Secretario General

Ref.: 26875/2018-1.0 LCP

Ref.: 23860/2018-2.1 CLW

WORLD METEOROLOGICAL ORGANIZATION

POLICY BRIEF

Transformative Climate Action: from Observations to Science to Services

Overview

Climate change negotiations under the presidency of the twenty-third Conference of Parties (COP 23) to the United Nations Framework Convention on Climate Change (UNFCCC) from Fiji were built around three Talanoa Dialogue questions: *Where are we now? Where do we want to go? And how do we get there?* The Talanoa questions provided the World Meteorological Organization (WMO) with an opportunity to report on the status of the global climate system and envision a roadmap for transformative climate action, centered on the continued and sustained provision of climate services for mitigation and adaptation in support of policy processes at a global, regional and country levels.

At a glance

- An Earth system approach provides an integrated basis from observations to scientific support for climate action;
- Observations support sciences and policy assessments;
- Science for services catalyzes innovation and investments in weather, water and climate research and operations;
- Accurate and fit-for-purpose information enables users to improve climate resilient decisions.

WMO pursues an integrated approach to the Earth system, connecting all components of the system (including atmosphere, oceans, land, hydrosphere, cryosphere and the carbon cycle) over a variety of spatial and temporal scales. This approach supports all nations, especially the most vulnerable, to become more resilient to extreme weather, climate, water and other environmental events, while pursuing the Sustainable Development Goals (SDGs), through the provision of data and of the best science-driven services (Fig. 1).

Fig. 1 - WMO contribution to the SDGs

This Policy Brief outlines how the national and global actions under WMO auspices contribute to answering the questions posed by the Talanoa Dialogue, through information and knowledge on weather, water, climate and environment. It further suggests ways through which such information can be introduced into policy making and implementation processes.

1. Where are we now?

Documenting and anticipating climate behavior

A better understanding of humankind's contribution to climate change and the nature and degree of such change allowed Parties to the UNFCCC to negotiate meaningful goals for the entry into force of the Paris Agreement (2015). Earth's temperature is one of the global indicators through which the success of Paris Agreement implementation is tracked and measured. The Paris Agreement seeks to hold the increase in the global average temperature to well below 2°C above pre-industrial levels, while pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

The global climate system in 2017

- *Global mean temperature in 2017 was approximately 1.1°C above the preindustrial era;*
- *The last five-year average global temperature is the highest on record*
- *Greenhouse Gas concentration levels reached new highs;*
- *Arctic and Antarctic sea ice is shrinking and sea-level rising;*
- *Ocean acidification continued rising.*

The WMO Statement on the State of the Global Climate in 2017, submitted to UNFCCC COP 23 in Bonn, Germany, incorporated additional indicators to describe in a more contextual way how Earth`s climate is changing. (Figure 2).

Figure 2- Headline indicators of the climate system as used in the WMO Statement (2017)

Climate science inputs for assessing climate risk

National policies, as well as, individual projects and investments, increasingly require climate observations and science inputs for understanding and addressing climate risks. A wealth of data on the past and current behavior of the climate system, as well as predictions and projections concerning its future behavior, is currently available at a global, regional and country-level scales. Given the advances

in climate prediction and climate monitoring during the last two decades, several types of data have been assisting WMO to characterize the climate system of the past, present and the future. Such information helps societies to improve their preparedness and reduce their vulnerability to weather and climate extremes. It includes;

- Global indicators of the state of the climate which must be relevant, representative, traceable, timeliness and in a limited number ;
- A set of indicators that can be used to inform management and which describes the societal impacts in future and which will help to assess if the right decision on mitigation and adaptation have been made;
- High-impact events and related indicators, associated with potentially widespread, multi-sectoral impacts.

Objective hydrological observation data is crucial for various applications, ranging from flood and drought forecasts to fact-based decision-making. WMO addresses this need through the Hydrological Status and Outlook System (HydroSOS).

Global climate indicators

Agenda 2030, adopted by the United Nations in 2015, seeks to use indicators to track progress on the various Sustainable Development Goals, including SDG 13 on combatting climate change and its impacts. WMO`s Executive Council in 2017 decided to continue promoting a single minimal set of indicators that describe climate change to further improving how we communicate about our changing climate, which were eventually discussed at the latest Climate Conference in Bonn in December 2017 (Figure 3).

Surface temperature is the indicator on which the Paris Agreement is based, but to communicate about the impacts of climate change and its consequences, additional global indicators like heating of the oceans and oceans becoming more sour, melting of glaciers, rising of sea levels, decreasing of snow cover and changes in the sea-ice in the Arctic and Antarctic are equally important. Global indicators will play a significant role in the Paris Agreement's Global Stocktake, a periodic five-year review of countries' Nationally Determined Contributions (NDCs) to the Paris Agreement implementation and the NDC's collective effectiveness. These indicators capture the major outlines of climate change without either over-simplifying or over-complicating its characteristics and they can only be derived if Essential Climate Variables (ECVs), can be globally coordinated and continuously observed. Governments signing on to the Paris Agreement have to take up their responsibility and commit to a global climate observing system.

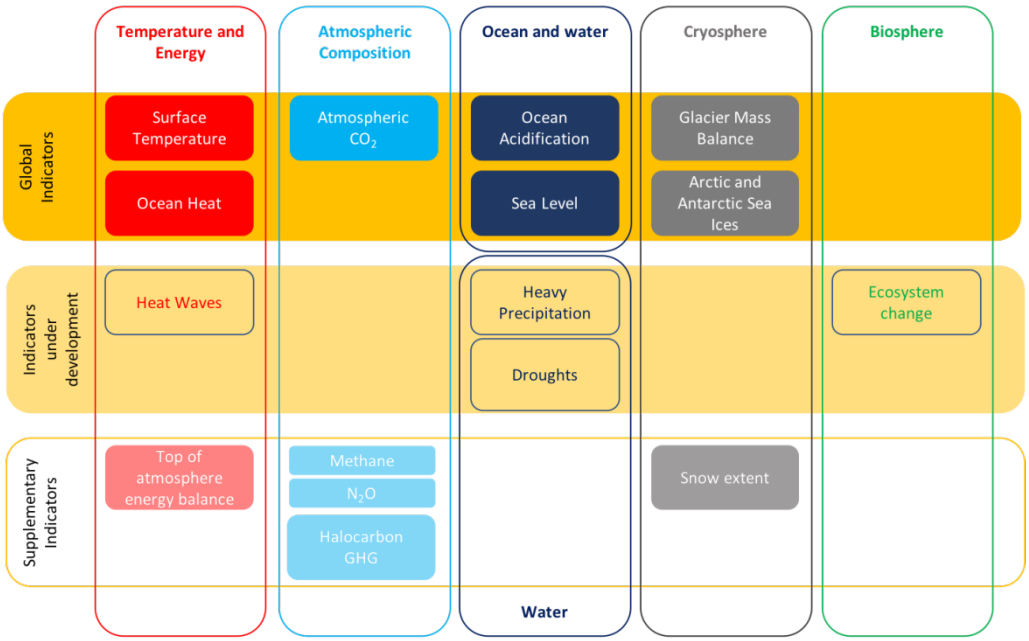

Figure 3: Global indicators as discussed at UNFCCC and further "Indicators under development" and "Supplementary indicators" proposed by the Global Climate Observing System.

NMHSs contribute to transformational climate action through:

- *Increased effectiveness and value for climate and water projects and investments;*
- *Improved quality of activities based on objective, scientific, evidence-based, data-driven conclusions and analysis;*
- *Better country capacity for climate analysis, water monitoring and delivery of climate services.*

Socio-economic based indicators

To complement the global indicators, socio-economic based indicators – are both highly diverse and context-specific. Climate affects almost every socio-economic sector to one degree or another: social (housing, education, and health), production (e.g. agriculture, tourism, industry and trade), and infrastructure (e.g. water and sanitation, energy, telecommunications, roads, railroads, airports).

For example, water is a primary medium through which climate change influences Earth's ecosystem and thus the livelihood and well-being of societies. Water is key for proactively achieving climate neutrality and resilience. The extent to which we will be able to enhance carbon sinks is dependent on the physical availability of water in the biosphere. Global water cycles will determine the effects of floods and droughts at the local level. Responding to the challenges of climate change impacts on water resources requires adaptation strategies at multiple spatial and temporal scales. The future global water architecture will need to be built on a solid scientific data base that will inform political processes and help governments directing development into sustainable futures. Countries will be urged to improve their water resources management systems and implement "no regrets" strategies, which have positive development outcomes that are resilient to climate change.

Integrating climate information and socio-economic characteristics enables the identification and preparation of context-specific climate variables and indicators that will complement global indicators, which can be used on a widespread basis across a region or set of countries with common

characteristics. For example, water basins information, although not covering the global scale, is critical for local sustainable water management and mitigating negative effects of floods and droughts, as well as to reduce risks of conflicts in water sharing either between different sectors or among countries. Sharing information and knowledge is critical to make this happen. WMO's global network of Regional Climate Centers assists in gaining efficiencies in the preparation of region-specific climate information, by integrating national, regional and global data sets and exchange thereof among countries on a regional basis.

High-impact events

Global environmental change shifts the context conditions for all hazards and risk analysis leading to changing frequencies, intensities, and durations of weather and climate extremes. This category of input data and products represents events (sometimes also known as extreme events) potentially associated with significant, widespread and multi-sectoral impacts. Such events have the common property of being characterizable in terms of magnitude, location, duration, timing and frequency of occurrence. Many are related to the water cycle, with implications for vulnerability to geophysical hazards, and for multi-hazard interaction.

Like the socio-economic based indicators above, different types of events affect different classes of societal assets and groups differently. Assignment of a unique identifier to each event, as is called for by Resolution 9 (Cg-17), would provide a reference, for use by the relevant authorities, with which to link the event to any associated loss and damage, contributing to Article 8 of the Paris Agreement, on averting, minimizing and addressing loss and damage. In the meantime, data on prior occurrence of such events is available at a variety of spatial scales, and for a variety of time periods, in national, regional and global data sets. WMO provides international coordination on climate change detection and on the development of relevant indices, in order to assess future risks of high impact events, as well as to provide useful information on climate extremes by translating raw data into information for decision making in climate adaptation and other applications.

2. Where do we want to go?

High quality climate services provide science based approach for national adaptation planning

The Paris Agreement calls for "Strengthening scientific knowledge on climate, including research, systematic observation of the climate system and early warning systems, in a manner that informs climate services and supports decision-making (Article 7, paragraph 7 (c))". Appropriate science-based information will reduce risks and maximize climate-related opportunities especially when coupled with the necessary institutional, infrastructure, and human capacity to transform and communicate this information for decision-making and improved stakeholder outcomes. The role of National Meteorological and Hydrological Services (NMHSs) in that regard will be pivotal in sustaining national climate and hydrological observations and provide relevant information as input for governmental submissions to the UNFCCC (National Adaptation Plans (NAPs), and NDCs) and for the preparation of climate finance investments. The advancement of 2030 Agenda as well as the implementation of NAPs can be evaluated in the light of climate and hydrological baseline data. This helps countries to assess mitigation and adaptation measures against the background of changes in the energy, carbon and water cycles, allowing adjustment of national development priorities.

The principle of best available science, when continuously applied, including through on-going research, will provide for continued enhancement of increasingly relevant climate data and products for use at multiple scales in support of decision making for adaptation and mitigation. The Global Framework for Climate Services (GFCS) provides guidance and structure for enhancing coordination, linkage and implementation of salient, actionable and user-driven climate services.

Capacity gaps for high quality climate services:

1. *The capacity to deal with climate-related risks is lacking in many countries;*
2. *The availability and quality of climate and water data are inadequate in many parts of the world;*
3. *The quality of climate services needs improvement to match user requirements;*
4. *Access to climate services needs to be established and improved in most countries;*
5. *Users and providers need to interact more effectively.*

WMO is working to initiate a standardized approach building on a climate data (global indicators, socio-economic based indicators and high impact events) that would facilitate aggregation of local and national conditions into WMO reports and IPCC global assessments, by improving climate research, enriching the national, regional and global data sets as well as national observing systems to detect climate variability and change. An operational system based on global comparable climate and water data and information will allow assessment of climate change in the context of a potentially changing hydrological cycle, increasing the knowledge on drought and floods and improving anticipation of crisis situations and conflicts.

Although many of the foundational capabilities and climate service infrastructures exist or are being established, many countries still lack policies, institutions or human resources with the right skills or practices to enable them to take advantage of new or existing climate data and products or create national user interface groups to establish national dialogue on these issues. Five key challenges have been identified through widespread consultation with WMO Members (see box). In its 48th session (May 2018), the Subsidiary Body for Implementation (SBI) of the UNFCCC invited WMO to continue directing its capacity-building efforts to support developing countries on the analysis of climate data and the development and application of climate change scenarios in vulnerability and risk assessment.

3. How do we get there?

National Frameworks for Climate Services (NFCS) ensure that the best climate science will support policy decisions and investments to address the risks and adapt to a changing climate.

Establishment of National Frameworks for Climate Services

The pathway towards achieving a science-based, nationally sustained and inclusive climate action will heavily depend on the partnership and collaboration within and across national borders. This includes the integration of national, regional and global data-sets, and capitalizing on regional synergies, as well as constant dialogue with stakeholders in all climate sensitive sectors from government Ministries to the private sector, from non-governmental organizations (NGOs) to civil society. An NFCS can be a key mechanism in support of the development and application of climate services. It ensures identification of priorities through consultative processes involving representatives of providers and sectoral users of climate services that inform

What is a National Framework for Climate Services (NFCS)?
An NFCS is an institutional mechanism to coordinate, facilitate and strengthen collaboration among national institutions to improve the co-production, tailoring, delivery and use of science-based climate predictions and services.

action by various stakeholders to achieve effective development, delivery, application and sustainability of climate services.

NMHSs should pursue a long term vision for the effective and innovative use of climate information backed by solid institutional and infrastructural capacities. A WMO Guideline for National Meteorological and Hydrological Services (NMHSs) on Capacity Development for Climate Services (in preparation) offers NMHSs and other climate service providers up-to-date information on the various available resources, strategies, procedures and best practices available to help develop capacities to those challenges. WMO also contributes to the development of technical capacities of NMHSs by providing capacity building support to developing countries on the analysis of climate data and the development and application of climate change scenarios in vulnerability and risk assessment.

Global coordination and partnering on key international, regional and national climate services

WMO is partnering with many United Nations and other international agencies on climate and water related activities to ensure provision of strong and coherent support to Member States in addressing climate change as an integral part of the implementation of the transformative 2030 Agenda for Sustainable Development. To this end, the United Nations system is strengthening its coordinated approach to the "Common Core Principles for a UN System-wide Approach to Climate Action". The principles have been designed to guide a system-wide approach and inform and strengthen the system's collective support to climate change action under the 2030 Agenda for Sustainable Development, the UNFCCC process, and the implementation of the Paris Agreement at the global, regional and national and sub-national level.

Information on the sources and sinks of the greenhouse gases

The NDCs are important tools for reaching the objectives of the Paris Agreement. The mitigation component of NDCs is based on the self-reported emissions compiled in accordance with the IPCC Guidelines for National Greenhouse Gas Inventories. The inventories have associated uncertainties and require many sources on the statistical information as an input. The transparency mechanism under the Paris Agreement requires more frequent update of the national inventories and in more transparent way. At the same time, the impact on temperature is controlled by atmospheric concentrations of greenhouse gases which are formed as a balance between natural and anthropogenic sources and sinks. Hence, atmospheric concentrations contain information on both sources and sinks of the greenhouse gases, it can be used to improve the knowledge/reduce the uncertainty of the national emission inventories. To assist Members in obtaining such information, WMO initiated development of the Integrated Global Greenhouse Gas Information System (IG3IS) that uses atmospheric observations of greenhouse gases and analysis tools and combines them with the socio-economic data to provide improved information on the state of national emissions and their geographic distribution. IG3IS has a potential to assist with timely update of the national emission estimates. The approach is currently being incorporated in the 2019 update of the IPCC Guidelines for National Greenhouse Gas Inventories. The IG3IS represents one of the important science-based tools that directly supports policy making. Use of the atmospheric observations and analysis allows for identification of the emission mitigation opportunities that could not have been found by the other means (e.g. identification of methane leakages). IG3IS provides spatially resolved information on emission that can guide the reduction actions on sub-national, urban and facility scales and it can qualify the effect of the taken actions on the emissions. The best practices based on the implementation of the IG3IS approach through pilot studies

are documented in the IG3IS Science Implementation Plan, that guides the Members on establishment of the IG3IS services in their countries.

Research support to operation and decision making

Research is crucial for continually improving the scientific quality of climate information, providing an evidence base for the impacts of climate variability and climate change and for the cost-effectiveness of using climate information and to support climate mitigation actions. The improved cooperation between research and operations can be realized through collaborative and multi-disciplinary interaction between NMHSs, universities, and other research and scientific institutions, and the development of decision support tools.

Open access and exchange of climate data and products

The WMO institutional network of NMHSs, regional and global centers and partners maintains an enormous inventory of potentially relevant data, methodological material and products generated and exchanged on a free and unrestricted basis under WMO auspices. It makes every efforts to ensure that these methods and data are readily accessible for the purposes of transformative climate action. In addition, WMO enhances the knowledge of NMHSs and other stakeholders in accessing, processing, analyzing and interpreting these methods and data.

The availability of platforms for structured access to the data and methods will assist all stakeholders to access the necessary climate information. This can build upon existing activities of WMO such as the Climate Services Toolkit (CST), WMO Regional Climate Centres (RCCs), Global Producing Centres (GPCs), on the ECV inventory established by space agencies, and other data centres can supply additional data and products to complement and fill gaps in those available locally, as well as complementary expertise for processing, analyzing and interpreting them. WMO has recently established the HydroSOS, a global reference data and information system that facilitates fact-based planning of operational water management systems, climate change adaptation and mitigation measures, seasonal and decadal quantification of water-related risks.

Strengthening the value chain for climate decision making

Climate science products and services at different spatial and temporal scales are increasingly becoming central elements in the preparation of climate rationales for transformative climate action. A climate rationale provides the scientific underpinning for evidence-based climate action decision making, ensuring that the linkages between climate and climate impacts and between action and societal benefits is fully grounded in the best available climate observations, data and science. It helps to delineate the value chain and the theory of change through which climate science, data and products inform decisions to effectively address the risks and adapt to a changing climate. In this regard, the flow of information across global to local scales is essential and must be facilitated for the achievement of resilience and adaptation to climate risk. For an effective delivery of climate information, and its utilization, appropriate operational institutional mechanisms should be put in place and strengthened to generate, exchange and disseminate information nationally, regionally and globally. Services generated by such operational systems are applicable to all climate finance investments (international, domestic, public or private). And, as described in previous sections, they create value beyond the implementation of individual projects and activities.

Public-Private Engagement

The World Meteorological Organization has established a goal of expanding the cooperation between the various stakeholders participating in the global weather enterprise. This is in-line with the UN Sustainable Development Agenda 2030 which emphasizes the need for more partnerships between public and private sectors as a necessity for achieving the ambitious Sustainable Development Goals (SDG). The achievement of the 2030 SDGs will require different sectors and actors working together in an integrated manner by pooling financial resources, knowledge and expertise. The new development era with 17 intertwined SDGs and 169 associated targets as a blue print for achieving the sustainable 'Future We Want', cross sectorial and innovative multi-stakeholder partnerships will play a crucial role for meeting the targets by the year 2030. Sustainable Development Goal 17, which reads "Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development", recognizes multi-stakeholder partnerships as important vehicles for mobilizing and sharing knowledge, expertise technologies and financial resources to support the achievement of the SDGs in all countries, particularly developing countries. Goal 17 further seeks to encourage and promote effective partnerships between public, private and academic sectors, as well as civil society, building on the experience and resourcing strategies of partnerships. The 70th Session of the Executive Council (June 2018) and the 18th World Meteorological Congress (June 2019) will develop further the guidance and policies needed by Members to strongly encourage and enable mutually beneficial partnerships and engagement between all sectors and stakeholders bringing tangible benefits to industries, peoples and society as a whole.

4. In Summary

The WMO pathway to transformative climate action is driven by an integrated approach to addressing increasing threats of extreme weather and climate, freshwater and ocean stress, air quality and environmental degradation. Climate science should be transformed into climate services as to strengthen resilience, mitigation and adaptation. This is achieved through the provision of actionable, accessible and authoritative information such as globally coordinated observations, the WMO climate science products in support of the international agenda on sustainable development, disaster risk reduction and climate change.

Public-private engagement is increasingly important for ensuring that WMO remains fit-for-purpose in face of the growing role of the private sector, technological advances, big data, crowdsourcing and artificial intelligence. At the same time, NMHSs and other WMO centres directly support climate smart decision-making at national level, enhancing preparedness and reducing losses of life and property from hydro-meteorological extremes, and strengthening the socioeconomic value of weather, climate and hydrological services.

Further reading

1. WMO (in draft), Guidelines for National Meteorological and Hydrological Services on Capacity Development for Climate Services;
2. WMO (2018), Step-by-step Guide for establishing a National Framework for Climate Services; (WMO 1206),
3. WMO (2017), WMO Statement on the State of the Global Climate in 2017; (WMO 1212),
4. WMO (2017), The Role of National Meteorological and Hydrological Services (NMHSs) in National Adaptation Plans (NAPs);
5. WMO (2017), WMO Greenhouse Gas Bulletin - No. 13: The State of Greenhouse Gases in the Atmosphere Based on Global Observations through 2016; (WMO)
6. WMO Bulletin Vol. 66(1)- 2017, An Integrated Global Greenhouse Gas Information System (IG3IS)
7. WMO (2016), Climate Services for Supporting Climate Change Adaptation: Supplement to the Technical Guidelines for the National Adaptation Plan Process; (WMO 1170),
8. UNFCCC (2015), Paris Agreement;
9. UNFCCC (2012), National Adaptation Plans: Technical Guidelines for the National Adaptation Plan Process.

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