

***THE ROLE AND OPERATION OF  
NATIONAL METEOROLOGICAL AND  
HYDROLOGICAL SERVICES***

***A Statement by the  
World Meteorological Organization  
for Decision-Makers***



**World Meteorological Organization  
Weather • Climate • Water**

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AND HYDROLOGICAL SERVICES  
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1. This statement by the World Meteorological Organization (WMO) is to urge decision-makers to enhance their support to National Meteorological and Hydrological Services to fulfil their mandates and deliver services that contribute to meeting societal needs and national development goals.

**Key Social and Economic Drivers**

2. Population safety and security, water and food security, economic growth and sustainable development, increasing prosperity, enhancing resilience to disasters and climate change, and improving public health, are issues of fundamental importance of every government. To deal with these issues, governments have to develop and implement effective policies that take into consideration the challenges of climate variability and change, and promote fundamental tenets of societal and environmental governance. However, with regard to societal well-being and economic growth, it is common knowledge that we are challenged by variations in our natural environment, made worse by changes in the climate, which threaten sustainable development of human societies through increased occurrence of severe weather and extreme climate events causing disasters and compromising food security, reduce availability of clean fresh water, cause displacement of populations, and the rise and spread of diseases, among other impacts. This is further compounded by growing urbanization and the expansion of human habitation into previously unoccupied high risk places, such as arid zones, mountain slopes, flood plains and the coastal zones prone to inundations, exposing populations to food insecurity, air and waterborne diseases, heat stress, drought, landslides, floods, storm surges and tsunamis.

3. Over the past decade, disasters from natural hazards have exacted a heavy toll. Globally, over 700 000 people lost their lives, over 1.8 million were injured, and more than 24 million were made homeless as a result of recorded disasters. Overall, almost 1.7 billion people were affected by disasters in various ways. The total economic loss was more than US\$ 1.4 trillion. In addition, between 2008 and 2012, 144 million were displaced by disasters. Only with a clear understanding of the risks associated with severe weather and extreme climate events, multi-hazard early warnings, integration of weather and climate information into decision-making and adequate disaster risk reduction and mitigation efforts can we develop resilient societies and sustain economic growth. For every dollar invested in early warnings issued by NMHSs, at least seven dollars of losses are offset.

4. Not all WMO Members' NMHSs have the required scientific, technological and human resources capabilities to monitor, forecast and issue warnings of severe weather and extreme climate events. The ability of NMHSs to provide high quality weather, climate, hydrological and related environmental services depends upon: (a) the availability of modern infrastructure and adequate, well trained human resources to gather, process, archive and exchange data and products; (b) their capacity to maintain high standards of observations and data; (c) their participation and access to research that leads to improved monitoring, predictions and understanding of the changes in weather, climate, water and the related environmental conditions at all spatial and temporal scales; (d) their capability to prepare and deliver high quality early warnings and impact-based forecasts of weather-, climate- and water-related hazards; and (e) their understanding and integrating the needs of various user communities, including emergency management authorities, into forecasts and warning programmes.

**The role of National Meteorological and Hydrological Services**

5. Investment in weather, hydrological and climate services has a significant contribution to efforts to save lives and property, minimize economic losses and sustain the natural environment.

The Convention of the World Meteorological Organization reaffirms “the vital importance of the mission of the National Meteorological, Hydrometeorological and Hydrological Services in observing and understanding weather and climate and in providing meteorological, hydrological and related services in support of relevant national needs which should include: (a) protection of life and property; (b) safeguarding the environment; (c) contributing to sustainable development; (d) promoting long-term observation and collection of meteorological, hydrological and climatological data, including related environmental data; (e) promotion of endogenous capacity-building; (f) meeting international commitments; and (g) contributing to international cooperation.”

6. As has been the case since the beginning of the modern era of societal and environmental management, knowledge of weather, hydrological and climate processes is key to all aspects of human endeavours as observed from their influence on cultures, traditions and development paths of societies. It is within this framework that NMHSs in various countries have been well positioned to monitor, forecast and issue warnings on a wide range of weather-, climate- and water-related events that affect human life and socioeconomic development. For example, with regard to natural hazards, NMHSs have been tasked to monitor and provide warnings of individual events, and to sensitize the population on their impacts to save lives, enhance resilience of societies, sustain productivity and economic growth, and reduce damage to property.

7. NMHSs are the official authoritative source, and in most countries, a single voice, on weather warnings in their respective countries, and, in many, they are also responsible for climate, hydrology, air quality, seismic and tsunami warnings and for space weather. To reduce and mitigate disasters requires NMHSs to provide quick, timely, accurate, broadly disseminated and understandable information as well as high quality services to inform governments and the public to take appropriate actions in response to warnings. NMHSs, within the framework of WMO, are working to improve the delivery and quality of services to help governments improve decision-making to enhance the resilience of populations to climate variability and change, enhance food production, improve water resource management, improve health outcomes, develop renewable energy, enable populations to adapt to climate variability and change, reduce risks and mitigate natural hazards and sustain development. By helping governments and the people to avert potential disasters and maximize opportunities for sustainable development, NMHSs are one of the main components of the risk information management, crisis management and development infrastructure of countries in their nation-building endeavours and indeed a contributor to sustainable development, particularly efforts to end poverty, enhance food security, and improve health outcomes, and access to renewable energy and clean water. NMHSs are working together with the public and private sectors to implement multi-hazard early warning systems, which aim to further significantly reduce the number of fatalities caused by weather-, water- and climate-related natural disasters.

8. NMHSs are the national reference point for compliance with the WMO standards. The critical deficiencies that have impacts on safety, nationally and internationally, by preventing Members from providing the required global, regional or national services should be resolved. They affect the ability of the entire global community to attain sustainable development, disaster risk reduction, and safety of transport in air, on land and sea, food security, sustainable management of water resources, manage climate risks, adapt to climate change and build resilient societies. NMHSs should be provided with adequate human, technical and financial resources to implement and operate modern infrastructure for gathering, processing, exchanging observations, data, and products to enable them to deliver high quality weather, climate, hydrological and related environmental services at sub-national, national, regional and global levels.

9. Cooperation amongst various organizations is essential for providing governments with these services. Partnerships between NMHSs and academia, government departments, international and non-governmental organizations, and where appropriate and possible, the private sector and civil society, help society make better decisions based on more complete and accurate weather, water and climate information. These partnerships provide better data coverage and information processing, higher resolution models, and more precise and useful specialized products for societal benefits, including opportunities to better support government and other

decision-makers regarding safety, economy, and security. NMHSs should work with these partnerships to develop appropriate national frameworks that facilitate the gathering and sharing of data, and expertise to make the information easy to access in real-time, in useful forms, and at low cost.

## **Future Requirements**

10. NMHSs are expected to play a key role and committed to the implementation of the Global Framework for Climate Services (GFCS) to realize the milestones indicated in the implementation plan that include developing and delivering services for agriculture and food security, water, health and disaster risk reduction initially; expanding climate services to other priority areas in the following years; and ensuring access to improved climate services throughout the world and across all climate-sensitive sectors.

11. In the year 2000, through the internationally agreed development goals, including those contained within the Millennium Declaration, the international community set forth specific targets to be reached by 2015. Beyond the year 2015, the sustainable development goals to succeed the Millennium Declaration, as well as post-2015 Disaster Risk Reduction Framework and the United Nations Framework Convention on Climate Change, will have a significant influence on the demands from NMHSs for user-oriented weather, hydrological, climate and related environmental services to meet the evolving needs of governments, partners and other decision-makers to achieve sustainable development. To ensure that evolving needs of societies are met, it is essential that governments and partners invest more in meteorology and hydrology to take advantage of the myriad advances in science and technology provided by NMHSs and their partners, that include the provision of multi-hazard early warnings and related services, 24 hours a day, 365 days a year, and climate services through the GFCS, which when properly applied can provide societies with the underpinning information to reduce and mitigate the impacts of natural hazards, and maximize the benefits from weather- and climate-related opportunities. WMO enables international cooperation, which is essential, both between countries and within the larger UN framework.

12. Access to good communication ensures that information is available on time wherever it is needed. Governments must recognize the importance of investing in the infrastructure and human resources essential for continuous monitoring of the environment in a harmonized and standardized way through WMO global regulatory framework. They should continuously support NMHSs to implement and operate essential infrastructure, and to modernize and develop this infrastructure to comply with WMO standards.

13. It is essential that societies be prepared to act appropriately in response to warnings. Education and training is paramount for improving preparedness, response and recovery. Early warning systems for natural hazards work only if governments have appropriate systems and their public know how to respond. Information must be easy to access, understand and use. Proactive and effective communication to the public, highlighting the intrinsic uncertainty in forecasts and warnings, is also essential.

14. To be effective, governments and other decision-makers must recognize NMHSs, as part of the international network coordinated through WMO, and as one of the essential driving forces for enhancing safety and well-being of society, ending poverty, sustaining development and economic growth, improving access to clean drinking water, enhancing food production, achieving good health outcomes, mitigating and adapting to climate change, exploiting renewable energy sources and increasing the prosperity of the world's citizens.

15. In order to strengthen the sustainability and competitiveness of NMHSs, governments are encouraged to put in place policies that would facilitate the recovery of costs for meteorological and hydrological services provided by them, particularly from aviation and marine sectors.