

HYDROMET GAP REPORT 2021

Executive Summary

With the past decade being the hottest on record,¹ and the increase in average global temperature already surpassing 1.2°C since pre-industrial times, it is clear that climate change is posing an existential threat. Current pledges, made in light of the Paris Agreement, are estimated to result in an average temperature increase of 3.2°C or more by the end of the century.² Developing countries, and in particular Small Island Developing States (SIDS) and Least Developed Countries (LDCs), are already experiencing the most devastating impacts from increasing weather, water and climate-related extreme events. This not only calls for ambitious mitigation measures but also for stepped-up adaptation and resilience efforts.

High-quality weather, climate, hydrological, and related environmental services ('hydromet' services) provide the foundation for effective climate adaptation and resilience action. Investments in improved weather forecasts, early warnings and climate information make massive economic sense. They create a triple dividend that includes: first, avoided losses – reliable and accurate early warning systems save lives and assets worth at least ten times their cost; second, optimized production – the estimated annual benefits of improved economic production through the application of weather forecasting in highly weather-sensitive sectors amount to about USD 96 billion;³ and third, improved long-term strategic response to climate change. The Global Commission on Adaptation estimates that strategically investing USD 1.8 trillion between 2020 and 2030 globally could generate USD 7 trillion in total net benefits.⁴ High-quality hydromet services are an essential requisite to realize these benefits.

Uniting our efforts to close the capacity gap on high-quality weather forecasts, early warning systems, and climate information as the foundation for resilient and sustainable development

The Alliance recognizes with urgency the mounting impacts of climate change especially on the world's poorest and most vulnerable countries. It shares the concern that many developing countries are facing major capacity constraints to provide hydromet services as the foundation for resilient and sustainable development. The Alliance aims to increase effectiveness and sustainability of hydromet investments through collective action. The members of the Alliance act within their respective resources and mandates and forge a collaborative partnership which recognizes and leverages respective competencies and expertise.

The Alliance was launched at UNFCCC COP25 and is comprised of the following 13 members: Adaptation Fund; African Development Bank; Asian Development Bank; Climate Investment Funds; European Bank for Reconstruction and Development; Global Environment Facility; Green Climate Fund; Islamic Development Bank; United Nations Development Programme; United Nations Environment Programme; World Bank; World Food Programme; World Meteorological Organization.



Launch of radiosonde (weather balloon) in Nadi, Fiji.

While hydromet services provide a foundational role for economic prosperity and resilient development, many countries face substantial challenges in delivering them. To more effectively support countries to address these challenges sustainably, the World Meteorological Organization (WMO) and major development and climate finance partners created the Alliance for Hydromet Development. The Alliance was launched at United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) 25 in 2019, and aims at uniting and scaling up efforts to close the capacity gap in the provision of high-quality weather forecasts, early warning systems, and climate information.

The Alliance has prioritized three activities for early collective action: First, deploying a common tool to benchmark and assess countries' hydromet capacity gaps – the Country Hydromet Diagnostics; second, creating an innovative mechanism to finance developing country surface-based weather and climate observations – the Systematic Observations Financing Facility; and third, producing a regular Hydromet Gap Report to track progress on closing the hydromet capacity gap – this is the executive summary of the first such report.

The Country Hydromet Diagnostics (CHD) are a standardized and integrated, operational tool and approach for assessing National Meteorological Services, their operating environment, and their contribution to high-quality hydromet services. They provide coherent and authoritative peer-to-peer assessments across countries.



The Diagnostics allow for a more systematic approach to strengthening countries' hydromet capacity, whereby the coordination, sequencing, and programming of investments are led by the country considering global requirements. The Diagnostics aim to inform hydromet policy and investment decision-making, guiding coordination and sequencing of investments from Alliance members and other funders. Through the Diagnostics, developing countries are expected to benefit from better targeted and aligned support as the assessment of maturity levels indicates where additional focus and investments are needed.

In partnership with 16 countries, a first round of the CHD was undertaken.ⁱ Among the assessed countries, there was a wide range of maturity across the different elements – with several countries at level 3 for the majority of elements (5 being the most mature), but many others at levels 1 or 2. The countries with the largest gaps lacked the most basic capacity in terms of equipment, skills and user engagement, despite the clear and growing risks. None of the assessed National Meteorological Services had advanced levels of a maturity for any element. However, there were also encouraging findings

i. Afghanistan, Austria, Chad, China, Côte d'Ivoire, India, Kyrgyz Republic, Liberia, Maldives, Morocco, Myanmar, North Macedonia, Sierra Leone, Switzerland, and Turkey.

ALL EFFECTIVE ACTION FOR CLIMATE ADAPTATION AND RESILIENCE REQUIRES HIGH-QUALITY WEATHER, CLIMATE, HYDROLOGICAL, AND RELATED ENVIRONMENTAL SERVICES - KNOWN AS HYDROMET SERVICES.

as several countries, despite their limited capacity, were making significant contributions to climate services. Based on the results of the Diagnostics, these countries are now able to develop programmatic hydromet interventions in collaboration with the Alliance partners.

Weather and climate observations ranked among the elements with the lowest average maturity levels reconfirming the fact that generating and internationally exchanging basic surface-based weather and climate observations remains a perennial challenge. This is particularly true for all LDCs and SIDS, as demonstrated by a global gap analysis undertaken by WMO.⁵ These countries are currently far from meeting the requirements of the internationally agreed Global Basic Observing Network (GBON), and the implications are severe.ⁱⁱ It is nearly impossible to provide high-quality forecasts in these countries. In addition, the lack of observations from these countries impacts the quality of forecasts across the entire globe. Satellite observations are important, but they cannot substitute for surface-based observations, and they themselves need validation from surface data. Without a substantial increase

The members of the Alliance are committed to deliver on ten specific tasks. For its initial work, the Alliance has been focusing on three priorities:

- Deploying a standardized tool to benchmark and assess countries' hydromet capacity gaps - the Country Hydromet Diagnostics.
- Creating an innovative mechanism to finance developing country surface-based weather and climate observations - the Systematic Observations Financing Facility.
- Producing a regular Hydromet Gap Report to track progress on closing the hydromet capacity gap by - this document is the executive summary of the first gap report.

ii. 193 WMO Members (states and territories) decided in 2019 to establish the Global Basic Observing Network (GBON) and to develop regulatory material for this network, with the aim of having the regulations take effect in January 2023. GBON specifies in clear, quantitative terms the commitments of the WMO Members to acquire and exchange certain observations: which parameters to measure, how often, at what horizontal and vertical resolution, when and how to exchange them, and which measurement techniques are appropriate to use.

of internationally exchanged surface-based observations, the quality of hydromet services cannot be significantly improved. These services can only be as good as the data they are built upon.

Therefore, the Alliance is committed to establishing the Systematic Observations Financing Facility (SOFF). The goal of SOFF is to strengthen climate adaptation and resilient development through the sustained collection and international exchange of high-quality surface-based weather and climate observations in compliance with the GBON. SOFF will address the persistent problem of missing foundational observations in a systematic manner. First, it will deploy a global approach with the actual international data exchange of observations as the single measure of success. Second, it will provide innovative finance – long term, results-based grant finance also in support of operations and maintenance. Third, it will enhance technical competence and effective coordination among the many stakeholders required for international data exchange. Through the combination of these features, and by leveraging its resources in close cooperation with other partners, SOFF will channel international support to substantially strengthen SIDS's and LDC's basic observing capacity and data exchange in new, more effective and sustainable ways. It is envisioned to announce SOFF at COP26 and make it operational in 2022.

Since its launch at COP25 the Alliance has advanced its work on its initial priorities. Going forward, the Alliance commits to: first, make SOFF operational; second, fine-tune the Country Hydromet Diagnostics and make them a fundamental basis for SOFF support; third, continue to engage with the private sector to explore innovative and financially viable business models to close the hydromet capacity gap; fourth, explore ways to enhance the effectiveness and range of early warning systems in a more coordinated and systematic manner; and fifth to continue increasing awareness to strengthen developing countries' hydromet capacity. The Alliance will capture lessons learned from its scaled-up work to close the hydromet capacity gap in the second Hydromet Gap Report, envisioned for 2023.

References

1. WMO (2021) 2020 was one of three warmest years on record
2. United Nations Environment Programme (2020). Emissions Gap Report 2020. Nairobi.pdf
3. Hallegatte, S. (2012). A Cost Effective Solution to Reduce Disaster Losses in Developing Countries: Hydro-Meteorological Services, Early Warning, and Evacuation. Policy Research Working Paper 6058, World Bank, Washington, DC.
4. The Global Commission on Adaptation (2019) Adapt Now: A Global Call for Leadership on Climate Resilience
5. https://library.wmo.int/doc_num.php?explnum_id=10377

ALLIANCE FOR HYDROMET DEVELOPMENT MEMBERS

ADAPTATION FUND
AFRICAN DEVELOPMENT BANK
ASIAN DEVELOPMENT BANK
CLIMATE INVESTMENT FUNDS
EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT
GLOBAL ENVIRONMENT FACILITY
GREEN CLIMATE FUND
ISLAMIC DEVELOPMENT BANK
UNITED NATIONS DEVELOPMENT PROGRAMME
UNITED NATIONS ENVIRONMENT PROGRAMME
WORLD BANK
WORLD FOOD PROGRAMME
WORLD METEOROLOGICAL ORGANIZATION

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The full report is available to download [here](#).



The World Meteorological Organization provides the Secretariat function for the Alliance that facilitates communication and knowledge sharing.

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