

## Call for Submissions from UAE 2023 – Global Goal on Adaptation

### Submission from WMO

July 2024

#### Background

Following the conclusion of the Glasgow–Sharm el-Sheikh work programme (FCCC/PA/CMA/2023/L.18, para. 5), the decision to launch a two-year UAE – Belém work programme (FCCC/PA/CMA/2023/L.18, para. 39); and the invitation for Parties and observers to submit views on matters relating to the UAE – Belém work programme, WMO is hereby expressing its views on indicators for measuring progress achieved towards the targets of the framework, to identify and as needed, developing indicators and potential quantified elements for those targets under the Paragraphs 9 and 10 of the [CMA.5 Decision](#) on the global goal on adaptation and modalities of the work programme, including organization of work, timelines, inputs, outputs and involvement of stakeholders.

WMO proposes indicators in the following areas, further elaborated below, relevant to paragraphs 9–10 of Decision 2/CMA.5:

FCCC/PA/CMA/2023/L.18, para. 9

1. Indicator on Climate Services for Climate-sensitive Sectors (*Crosscutting para. 9*)
2. Indicator on Climate-induced Water Scarcity and Enhanced Climate Resilience to Water-related Hazards (*Target a*)
3. Indicator on Climate Services for Agriculture (*Target b*)
4. Indicator on the Co-production of Climate Services (*Target g*)

FCCC/PA/CMA/2023/L.18, para. 10

5. Indicator on Systematic Observation Readiness for Adaptation (*Target a*)
6. Indicator on the Number of Parties with Established Multi-hazard Early Warning Systems (*Target a*)
7. Indicator on Climate Science Information for Climate Action *or* National Adaptation Plans (*Target b*)
8. Indicator on Climate Finance for Early Warning Systems, Hydromet and Climate Services (*Target c*)
9. Indicator on High Quality and Certified Climate Services (*Target c*)

**WMO activities contribute to the science-based indicators and metrics for the targets under [FCCC/PA/CMA/2023/L.18, para. 9](#) for measuring progress to:**

## **1. Indicator on Climate Services for Climate-sensitive Sectors**

### **Formulation**

“Climate services for sectoral applications that support policy and planning in climate-sensitive sectors (e.g. food and agriculture, water, health, infrastructure, ecosystems, and other climate-sensitive sectors)”.

### **Description**

In order to strengthen efforts for adaptation, including long-term transformational and incremental adaptation, the global goal on adaptation should be inclusive in terms of adaptation approaches, and should take into account the best available science and this requires Parties to have adaptive capacity to develop climate information services. This indicator describes quantitatively if Parties develop climate information services to guide policy and planning decisions in climate-sensitive sectors.

### **Means of verification**

WMO Members regularly assess their capacity for providing climate services and documenting associated socio-economic outcomes and benefits through a “Checklist for Climate Services Implementation” that addresses functional capacities across the climate services value chain, including their services provided to the sectors. The Checklist is subject to quality management auditing.

### **Underpinning methodology**

- Checklist for Climate Services Implementation:
  - [Resolution 1 \(EC-75\)](#) on the use the climate services checklist as a basis for identifying capacity development priorities and needs by WMO Members;
  - [Resolution 21 \(Cg-18\)](#) on regular assessments of service delivery at global, regional and national scales and publishing a “State of climate services” report regularly.

### **Relevance of the indicator**

Recalling that the Conference of the Parties, serving as the meeting of the Parties to the Paris Agreement (CMA), invited WMO, through its Global Framework for Climate Services (GFCS), to regularly report on the State of Climate Services with a view to “facilitating the development and application of methodologies for assessing adaptation needs” ([Decision 11/CMA.1, 2018](#)), as part of the Methodologies for assessing adaptation needs with a view to assisting developing countries without placing undue burden on them (Decision 11/CMA 1/III para 19).

### **Data sources and availability**

- This data is currently available for 179 out of 193 WMO Member countries and is updated on a regular basis since 2018.

- [Climate services dashboard](#), will be updated ahead of COP29, for the launch of the 2024 State of Climate Services report to reflect the new dataset.

*(a) Significantly reducing climate-induced **water scarcity and enhancing climate resilience to water-related hazards** towards a climate-resilient water supply, climate-resilient sanitation and access to safe and affordable potable water for all.*

## **2. Indicators on Climate-induced Water Scarcity and Enhanced Climate Resilience to Water-related Hazards**

For countries to report on climate-induced water scarcity and hazards, there is a need to understand how climate change factors influence the hydrological cycle and therefore the status of water resources at different levels. National Meteorological and Hydrological Services (NMHSs) are collaborating to increase this understanding and monitor the effects.

### **2.1 Indicator on Climate-induced Water Scarcity**

#### **Formulation**

[Standardized Precipitation Evapotranspiration Index](#) (SPEI)

#### **Description**

As Target 9(a) specifically refers to “climate-induced” water scarcity, we suggest using drought indicators in combination with water scarcity indicators (which are driven more by non-climate induced factors). Drought is a natural climatic feature of below-average precipitation for a period of time, which leads to a temporary significant decrease in water availability (atmospheric, surface, soil, or groundwater) over a period of weeks to years. In many regions, the balance between water supply and demand is fragile, and droughts can trigger, amplify, and/or accelerate the development of an unsustainable water balance, leading to water scarcity. Therefore, drought indices are useful indicators to monitor climate-induced water scarcity. There is a range of [commonly used drought indicators/indices](#) being applied. ([IDMP, 2022](#)) The SPEI has been approved by WMO members as one of the main meteorological drought indices that countries should use to monitor and follow drought conditions. The indicator can be applied to advance monitoring, early warning, and information delivery systems. These efforts support risk-based drought management policies and preparedness plans. ([WMO and GWP 2016](#))

## **Underpinning methodology**

The SPEI uses the basis of [Standardized Precipitation Index](#) (SPI), but includes a temperature component, allowing the index to account for the effect of temperature on drought development through a basic water balance calculation. This is important to the overall water balance and water use of a region.

Resources: SPEI code is freely available and the calculations are also described in the literature, <http://sac.csic.es/spei/>; Reference: Vicente-Serrano, S.M., S. Begueria and J.I. Lopez-Moreno, 2010: A multi-scalar drought index sensitive to global warming: the Standardized Precipitation Evapotranspiration Index. *Journal of Climate*, 23:1696–1718

## **Data sources and availability**

The SPI, used as a basis for the SPEI, provides the historical precipitation records for any location to develop a probability of precipitation that can be computed at any number of timescales. Owing to the utility and flexibility of SPI, it can be calculated with data missing from the period of record for a location. The program used to calculate SPI is easy to use and readily available.

<http://sac.csic.es/spei/>

## **Potentiality to be aggregated**

The SPEI is easy to interpret, ensuring accessibility to a wide range of stakeholders, including policymakers, researchers, and the general public. It has multiple applications, addressing events that affect water resources availability, agriculture productivity, energy production, and other fields. The SPEI provides monthly updates allowing it to be used operationally, and the longer the time series of data available, the more robust the results will be. The index can be used to identify and monitor conditions associated with a variety of drought impacts.

## **Reflects regional, national and local circumstances**

The SPEI can effectively reflect regional, national, and local circumstances, making them context-specific. The output of the SPEI is applicable for all climate regimes, with the results being comparable because they are standardized.

## **2.2 Indicators on Enhanced Climate Resilience to Water-related Hazards Formulation**

“Percentage of population protected by high-quality hazard monitoring and forecasting products for enhanced climate resilience to water-related hazards”.

### **Description**

Early warnings enable timely actions that mitigate impacts, ensuring community preparedness and efficient disaster response. These indicators inform data-driven policies, guide resource allocation, and attract necessary funding for further system development. They highlight capacity-building needs, enhance



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public awareness, and measure adaptive progress to climate change. Additionally, they promote an integrated approach to risk management and foster regional cooperation. Overall, monitoring these indicators ensures that efforts to improve climate resilience are targeted, effective, and inclusive, leading to safer, more prepared communities.

### **Data sources and availability**

WMO collects data of countries capabilities and resilience to water-related hazards through multiple methods. The data collected are a combination of quantitative and qualitative data, with an emphasis on ensuring data quality and objectivity.

Data Collection Methods:

- WMO Hydrological Status and Outlook Services (Regional and National)
- Matrix/Online Assessment tool for End-to-End Flood Forecasting and Early Warning Systems (WMO No. 1286)
- WMO Regular Data Collection Campaign (2020, 2024)
- WMO Hydro Survey

EW4All Dashboard: <https://wmo.int/activities/monitoring-and-evaluation-merp/early-warnings-all-dashboard>

Global Flash Flood Guidance System (FFGS) Status: <https://experience.arcgis.com/experience/bb4357054fb5475a9a4cf688c4180454/page/FFGS-Status/?views=Flash-Flood-Component%2CFlash-Flood-Component>

### **Means of verification**

The data can be verified through peer-review, cross-referencing with other data collection methods and ad-hoc validation.

### **Underpinning methodology**

Under the Early Warnings for All (EW4All) initiative a Monitoring and Evaluation Working Group (WG-M&E), co-led by UNDRR and WMO, aims to ensure coordinated monitoring, data-driven decisions, and transparency and accountability of the implementation of the Early Warnings for All initiative. Several indicators within the [EW4All framework](#) directly contribute to tracking resilience to water-related hazards, including related to monitoring resilience to water-related hazards, as well as crosscutting indicators (for meteorology, hydrology, climatology). Together these direct and indirect indicators, considerations and crosscutting aspects provide a comprehensive overview of the status of the countries capacity to forecast, monitor and warn, and eventually to protect their population and build adaptation and resilience against climate induced water-related hazards.

(b) Attaining **climate-resilient food and agricultural production** and supply and distribution of food, as well as increasing sustainable and regenerative production and equitable access to adequate food and nutrition for all.

### **3. Indicator on Climate Services for Agriculture**

#### **Formulation**

Number or proportion of people (disaggregated by gender, indigenous status, disability status, age group) receiving tailored climate services for the agriculture sector, to inform agricultural resilience and adaptation actions.

#### **Sub-indicator**

No of countries providing tailored climate services for the agriculture sector to inform agricultural resilience and adaptation actions.

#### **Description**

This would be a simple process indicator to understand the level of provision of climate services to the agriculture sector.

#### **Relevance of the indicator**

The importance of climate services to resilience and adaptation in the agriculture sector is highlighted in WMOs previous submission, noting that:

1. agriculture features prominently in the NAPs of many developing countries, both in terms of vulnerability to climate change (impacts on crop yields, pasture availability, livestock productivity, post-harvest losses) as well as prioritization of adaptation actions.
2. agriculture also features prominently in the NDCs, firstly as a major GHG emitter and secondly as an area for obtaining co-benefits in terms of mitigation and adaptation, therefore, contributing to the mitigation and resilience goals of the Paris Agreement.

Climate services play a key role in adaptation in agriculture. CS on different timescales can inform seasonal agricultural adaptation for farmers and long-term adaptation planning for agricultural investments by Ministries of Agriculture. Enhancing the application of climate services (including seasonal forecasts, decadal predictions and long-term climate projections) coupled with impact and vulnerability assessments (e.g., crop yield modelling, crop suitability mapping under different climate scenarios, crop specific vulnerability assessments) are key aspects for understanding and identifying strategies for adaptation and resilience in the sector.

#### **Underpinning methodology**

This would be a simple process indicator to understand the level of provision of climate services to the agriculture sector. The information would be gathered based on the "Checklist for Climate Services Implementation" that WMO administers to national meteorological and hydrological services annually to assesses country capacities across the climate services value chain and WMO Members' contribution to the NAPs process.

### **Means of verification**

At best, though possibly not yet data ready, information could be gathered about the number or proportion of people receiving tailored climate services for the agriculture sector. However, most simply and possibly more data readily, information can be gathered at national level through a simple yes/no question added to the Checklist for Climate Services Implementation to determine whether national meteorological and hydrological services provide tailored climate services to the agriculture sector. Further details can possibly be requested about the level of provision of these services (national to local level), timescales and types of services provided.

### **Potentiality to be aggregated**

This indicator can be aggregated with information about country capacities in relation to the generation and use of climate information. Since 2018, WMO has regularly undertaken this review through a "Checklist for Climate Services Implementation" that assesses country capacities across the climate services value chain and WMO Members' contribution to the NAPs process. Tailored questions can possibly be included to gather information on various aspects of climate services delivery. This could also link with indicators proposed below on coproduction of climate services.

*(g) Protecting cultural heritage from the impacts of climate-related risks by developing adaptive strategies for preserving **cultural practices and heritage sites** and by designing climate-resilient infrastructure, guided by **traditional knowledge, Indigenous Peoples' knowledge and local knowledge systems**.*

## **4. Indicator on the Co-production of Climate Services**

### **Formulation**

"Number of countries that conduct co-production of climate services and climate change information with indigenous knowledge holders as well as local, gender, youth, and diversity inclusive perspectives".

### **Sub-indicator**

Number or proportion of people (disaggregated by gender, indigenous status, disability status, age group) are involved in the production of climate services for adaptation.

### **Description**

This indicator helps to understand the level of involvement of local people and indigenous knowledge holders in the co-design of climate services ensuring climate action that builds on traditional knowledge, Indigenous Peoples' knowledge and local knowledge systems. It also reports on Indigenous people's access and contributions to the design of climate services, ensuring a

widespread access to information that can support adaptation, particularly in developing countries.

### **Relevance of the indicator**

The Decision 3/CP.27 related to the Sharm el-Sheikh joint work on implementation of climate action on agriculture and food security, acknowledges that the increasing frequency of extreme weather events has exposed millions of people, especially small-scale farmers, those from low-income households, indigenous peoples, women and youth in developing countries, to acute food and water insecurity. Decision 9/CP.27 also notes that the best available science, as well as traditional, indigenous and local knowledge, should be taken into account in addressing the priority gaps and needs referred to in enhancing the process of formulating and implementing national adaptation plans for developing countries.

This indicator will monitor the effective and continued integration of indigenous knowledge along with scientific, and technical knowledge and the crucial role of local communities and indigenous peoples, youth and women, in addressing and responding to climate change through multilevel, transdisciplinary and cooperative action.

### **Underpinning methodology**

The [Step-by-step Guidelines for Establishing a National Framework for Climate Services](#) (WMO-No. 1206) explains how to initiate and develop a functional NFCS that will serve as a key coordination mechanism to bring together the local, national, regional and global stakeholders needed for successful generation and delivery of co-designed and co-produced climate services with and for users, effectively linking climate knowledge with action on the ground at national and local levels.

The WMO methodology for [Developing the Climate Science Information for Climate Action \(WMO-No. 1287\)](#) shows how to bring together different actors involved in the process of production of climate science information to discuss and better understand the co-design of climate services that can enable climate action. The methodology discusses how to leverage context-specific local knowledge through a stakeholder-driven, country-owned approach which helps to determine what climate actions are the most viable and effective in local contexts.

The Checklist for Climate Services Implementation will be the key means of gathering information on this indicator. WMO Members regularly assess their capacity for providing climate services and documenting associated socio-economic outcomes and benefits through a "Checklist for Climate Services Implementation" that addresses functional capacities across the climate services value chain, including the establishment of multi-stakeholder user-interface platforms.



### **Means of verification**

The number of countries that include and actively engage with Indigenous knowledge holders and enable their contribution to the design and implementation of climate information services through the WMO Checklist for Climate Services Implementation. Information about the National Frameworks of Climate Services (user-interface platforms) can also be used to assess how national multistakeholder processes are effective in integrating indigenous people's knowledge and perspectives in the design and delivery of climate services.

### **Team of experts**

WMO Task Team on Indigenous and Local knowledge and Weather and Climate Services (TT-ILK) under SC-AGR and Expert Team on Capacity Development for Climate Services (ET-CDC). WMO-FAO-UNESCO Team on

### **Potentiality to be aggregated**

This indicator can be aggregated with information about the generation and use of climate science information for climate action at the national and sub-national level to monitor whether the science basis can be assessed as inclusive, participatory and transdisciplinary.

### **FCCC/PA/CMA/2023/L.18, para. 10**

*(a) Impact, vulnerability and risk assessment*

**GCOS provides a separate submission.**

## **5. Indicator on Systematic Observation Readiness for Adaptation**

"Basic weather and climate data are collected and internationally exchanged to to underpin effective development and climate policy and implementation of adaptation responses".

### **Description**

In order to save lives and livelihoods as well as protect property across the whole globe, the availability of basic weather and climate observations from the most data sparse areas must be improved. Basic data are vital for weather forecasts, early warning systems and climate information services. The lack of such observations limits countries' capacity to provide well-informed, high-quality weather and climate services, which contribute to climate change adaptation plans, building resilience.

### **Data sources and availability**

In 2021, the 193 countries and territories of the the World Meteorological Organization agreed to a set of basic global weather and climate data that all countries must generate and internationally exchange, the landmark agreement on the Global Basic Observing Network (GBON).

The World Meteorological Congress in 2021 also decided to create the Systematic Observations Financing Facility (SOFF) jointly with UNDP and UNEP. SOFF has been created as a specialized UN Fund to support in particular Least Developed Countries (LDC) and Small Island Developing States (SIDS) with grant-based finance and technical assistance to achieve sustained GBON compliance. The WMO Integrated Global Observing System (WIGOS) Data Quality Monitoring System (WDQMS) webtool is a resource developed by the World Meteorological Organization WMO and hosted by the European Centre for Medium-Range Weather Forecasts (ECMWF), to monitor the performance of all WIGOS observing components. This module monitors the availability and quality of this observational data based on near-real-time monitoring information from the four participating global Numerical Weather Prediction (NWP) centres. The Global Basic Observing Network (GBON) module monitors GBON stations according to the GBON compliance criteria.

### **Means of verification**

[The WMO GBON Compliance App](#) for monitoring and reporting for GBON surface and upper-air stations. To be considered, a station needs to have reported, as monitored by WDQMS, at least 80% of expected observations on at least 80% of days during the month.

### **Relevance of the indicator**

The current gaps in global surface-based data significantly impact the quality of weather and climate services locally, regionally, and globally. GBON and SOFF work to improve the availability of the essential surface-based observational data, which are expected to enhance the quality of weather forecasts, thus helping improve the safety and well-being of citizens throughout the world and bring socioeconomic benefits.

Collecting and sharing surface weather and climate data can capture highly heterogeneous topography with several microclimates, and climate cycles. Better data informs better forecasts and services, which can help improve early warning systems and national adaptation plans.

### **Reflects regional, national and local circumstances**

## **6. Indicator on the Number of Parties with Established Multi-hazard Early Warning Systems**

### **Formulation**

“Number of people who access effective, end-to-end, early warning systems for extreme climate, weather, and water events”.

### **Description**

The highest level of measurement of the effectiveness of an early warning system is measured against the casualty and livelihood loss risk. Namely, the risk of losing one's life and livelihood to an extreme event. This is measured by Member States under the SDG Goal 1 on Poverty and the Sendai Framework on Disaster Risk Reduction Targets 1 and 2.

The proposed indicator on access to early warning systems for extreme climate and weather events is one level of aggregation down and measures the effectiveness of an early warning system against the number of people potentially impacted by the extreme events affecting the country and region to whom warnings are disseminated so they can take action to protect their lives and livelihoods.

Measuring this requires the aggregation of several indicators on early warning service delivery and accessibility, referred to as end-to-end (risk information availability and tools, monitoring and forecasting, warning communications and preparedness to respond). The UN (UNDRR, WMO and ITU) and the IFRC develop these indicators, assist countries to monitor them and aggregate them in the context of the EW4All and its maturity index.

### **Relevance of the indicator**

Paris Agreement Article 7 on enhancing action on adaptation calls on Parties to strengthen their cooperation and to enhance action for early warning systems. 88% of LDCs and SIDS that submitted their Nationally Determined Contributions (NDCs) to the Paris Agreement identified early warning systems as a priority. IPCC AR6, SPM.C.2.13 identifies early warning as an adaptation option that has broad applicability across sectors and provides benefits to other adaptation options (high confidence).

The Climate Risk and Early Warning Systems (CREWS), a dedicated financing mechanism for early warning systems, established by Member States as a contribution to the UN Secretary-General's climate change action agenda, measures the effectiveness of its financing in LDCs and SIDS against these indicators. SOFF is a foundational element and delivery vehicle of the EW4All initiative and strengthens the data foundation of effective early warnings.

The proposed indicator and its monitoring is aligned with other global agreements (SDGs and Sendai Framework for Disaster Risk Reduction), and relevant regional frameworks.

### **Underpinning methodology**

The Early Warning System Maturity Index monitors the effectiveness of early warning systems based on an index of indicators, on their relevance, the applicability across different contexts and their measurability. Effectiveness is expressed in terms of levels, with scales (from 'less than basic' to 'advanced').

These indicators are aligned with the existing monitoring of the four elements of an effective early warning system, the Sendai Framework monitor, and related regional early warning policies and frameworks.

The applicability of the indicators is tested through the monitoring of the effectiveness of CREWS and other financing mechanisms investments in countries.

## **Means of verification**

The EW4All Maturity Index.

The Sendai Framework for Disaster Risk Reduction target monitor.

## **Team of experts**

Expertise on measuring the effectiveness of early warning systems is available in WMO's Expert Team for Early-Warning Services (ET-EWS), a subsidiary body of the Services Commission (SERCOM), and in the UNDRR Bonn Office and the CREWS Secretariat.

## **Potentiality to be aggregated**

*(b) Planning: by 2030 all Parties have in place country-driven, gender-responsive, participatory and fully transparent **national adaptation plans**, policy instruments, and planning processes and/or strategies, covering, as appropriate, ecosystems, sectors, people and vulnerable communities, and have mainstreamed adaptation in all relevant strategies and plans.*

## **7. Indicator on Climate Science Information for Climate Action or National Adaptation Plans**

### **Formulation**

"Climate action decisions, including national adaptation plans, policies and investment plans, that are based on the best available weather, water and climate science information, including through the relevant knowledge and climate information products convened by Regional and National Climate Forums."

### **Description**

This indicator can describe the use of available observationally based, reanalysis and models to develop a justification for a national adaptation plan, climate policy or project funding based on climate risks and needs, by providing means to monitor the implementation and effectiveness of climate-related projects such as adaptation measures.

The indicator is qualitative since it is based on the integration of science information into policy documents as well as quantitative since it also fosters the generation and inclusion of measurable state of the climate indicators in the policy instruments and is based on the number of Regional and Climate Forums that support the generation of climate science based policy, plans and investments.

### **Means of verification**

Review of the science basis sections of NAPs and policy instruments submitted by Parties to the UNFCCC. This review has been regularly undertaken at a basic level by WMO through a "Checklist for Climate Services Implementation" that assesses country capacities across the climate services value chain as well as WMO Members' contribution to the NAPs process.

## **Underpinning methodology**

WMO methodology for [Developing the Climate Science Information for Climate Action \(WMO-No. 1287\)](#), data, tools and associated technical resources for enhancing the climate science basis for National Adaptation Plans (NAPs), climate policies, projects and investments. The technical guidance on climate science information for climate action points to a variety of technical resources that support the formulation and implementation of climate action based on measurable climate indicators and indices:

1. An online [Climate Information Platform \(CIP\)](#) that provides access to projections of 28 pre-calculated climate and water indicators at a regional model scale, derived from fully coupled global and regional climate models.
2. Online access to [Climpact](#) – for calculation of over 70 indices associated with climate impacts, from historical daily temperature and precipitation data.
3. Online access to [Climdex](#) – for downloading and analysis of pre-calculated indices from global and regional observed and modelled climate extremes. The Climdex indices help to understand patterns in temperature and precipitation extremes, how they change from year to year or from place to place.

## **Relevance of the indicator**

Recalling that the Conference of the Parties, serving as the meeting of the Parties to the Paris Agreement (CMA), invited WMO, through its Global Framework for Climate Services (GFCS), to regularly inform the Subsidiary Body for Scientific and Technological Advice about its activities aimed at improving the availability and accessibility of comprehensive climate information, including observational data, and about how it facilitates the provision and dissemination of the most up-to-date climate model predictions and projections (Decision 11/CMA 1/III para 19).

This indicator is particularly relevant to least developed countries (LDCs), small island developing states (SIDS) and developing countries since it provides information on the capacity and skills to interpret, formulate and effectively articulate climate science analyses and identify and select the most effective climate actions to address climate impacts.

## **Potentiality to be aggregated**

This indicator can be aggregated with information about country capacity levels in relation to the generation and use of climate science information for action as well as the ability to use climate science to design effective investments and unlock climate finance.

*(c) Implementation: by 2030 all Parties have progressed in **implementing their national adaptation plans**, policies and strategies and, as a result, have reduced the social and economic impacts of the key climate hazards identified in the assessments referred to in paragraph 10(a) above.*

## **8. Indicator on Climate Finance for Early Warning Systems, Hydromet and Climate Services**

### **Formulation**

"Number of early warning systems, hydro-met systems and climate information services related projects funded by Multilateral Development Banks (MDBs) and climate finance institutions leading to improved adaptation outcomes."

### **Relevance of the indicator**

The 28th session of the Conference of the Parties (COP28) through the Glasgow Climate Pact (Decision 1/CMA.3) recognized that adaptation finance will have to be significantly scaled up beyond the doubling to support the urgent and evolving need to accelerate adaptation and build resilience in developing countries. Climate finance should consider the need to support the implementation of current Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs), increase ambition and accelerate action.

Since 2019, WMO through its State of Climate Services reports, has been highlighting the need for investments to strengthen the climate science basis for both mitigation and adaptation, particularly in the areas of climate services for agriculture and food security risk information and early warning systems, climate services for water resource management, climate services for energy and climate services for health.

### **Means of verification**

EW4All finance tracking tool developed by WMO and UNDRR: WMO and UNDRR jointly collaborate to collect and compile investment data on EWS as a contribution to the EW4All initiative launched by the UN Secretary-General in 2022. The so called EW4All finance tracking tool includes more than 300 projects from Multilateral Development Banks and Climate Finance Institutions. The analysis of the database of ongoing and pipeline projects that relate to early warning systems and hydromet investments, highlight a significant gap in NMHSs involvement in such projects.

### **Potentiality to be aggregated**

The indicator has the potential to be aggregated with the data on the indicator on adaptive capacity to develop high-quality and certified climate information services that are crucial to the implementation of the Global Goal on Adaptation to identify gaps in financing and at the same time identify investments that have led to outcomes/benefits in advancing adaptive capacities.

## 9. Indicator on High Quality and Certified Climate Services

“Parties have adaptive capacity to develop high-quality and certified climate information services that are crucial to the implementation of the Global Goal on Adaptation”.

### Sub-indicator

An indication if these climate information services are quality controlled.

### Description

This indicator is related to related to [Decision 11/CMA.1, 2018](#). In order to strengthen efforts for adaptation, including long-term transformational and incremental adaptation, the global goal on adaptation should be inclusive in terms of adaptation approaches, and should take into account the best available science and this requires Parties to have adaptive capacity to develop climate information services. This indicator describes quantitatively and qualitatively Parties’ capacities for Impact, vulnerability and risk assessment to develop and use climate information services to inform National Adaptation Plans and have the capacity to implement them.

### Means of verification

WMO Members regularly assess their capacity for providing climate services and documenting associated socio-economic outcomes and benefits through a “Checklist for Climate Services Implementation” that addresses functional capacities across the climate services value chain. The Checklist is subject to quality management auditing.

### Underpinning methodology

- Resolution 64 (Cg-17) — Development of a results-based framework for WMO support to the implementation of the Global Framework for Climate Services, and [6 \(EC-67\)](#) — A mechanism to advance WMO contribution to the Global Framework for Climate Services, and [Decision 16 \(EC-68\)](#) — Country-focused results-based framework and mechanism for WMO contributions to the Global Framework for Climate Services, a mechanism was created to guide WMO contributions to the Global Framework for Climate Services (GFCS).
- Checklist for Climate Services Implementation:
  - [Resolution 1 \(EC-75\)](#) on the use the climate services checklist as a basis for identifying capacity development priorities and needs by WMO Members;
  - [Resolution 21 \(Cg-18\)](#) on regular assessments of service delivery at global, regional and national scales and publishing a “State of climate services” report regularly; and
  - [Resolution 10 \(Cg-19\)](#) on WMO Strategy for service delivery.
- WMO Capacity development strategy, as the basis for the Climate Services capacity level assessment and the development of the checklist questions:

<https://library.wmo.int/records/item/54629-wmo-capacity-development-strategy-and-implementation-plan>

- Functional capacities assessed by the checklist are organized into six groups: Governance, Basic Systems, the User Interface, Capacity Development, Provision and Application of Climate Services, and Monitoring and Evaluation of socio-economic benefits. Many of these functional capacities constitute “basic”, “essential”, “full” or “advanced” functionalities. The percentages of “yes” and “no” responses to the checklist questions in each group for each capacity level provide a basis for assessing country capacities and needs in each area, and for categorizing the overall level of service provided by the Member according to WMO criteria.
- WMO Expert team on Capacity development for climate services is mandated by WMO Services Commission to verify and validate the climate services capacity levels.

### **Relevance of the indicator**

Recalling that the Conference of the Parties, serving as the meeting of the Parties to the Paris Agreement (CMA), invited WMO, through its Global Framework for Climate Services (GFCS), to regularly report on the State of Climate Services with a view to “facilitating the development and application of methodologies for assessing adaptation needs” ([Decision 11/CMA.1, 2018](#)), as part of the Methodologies for assessing adaptation needs with a view to assisting developing countries without placing undue burden on them (Decision 11/CMA 1/III para 19).

This indicator is particularly relevant to least developed countries (LDCs), small island developing states (SIDS) and developing countries since it provides information on the capacity and skills to conduct up-to-date assessments of climate hazards, climate change impacts and identify and select the most effective climate actions to address climate impacts (as per decision addressed to WMO CMA1.11/2018).

### **Data sources and availability**

- This data is currently available for 179 out of 193 WMO Member countries and has been updated on a regular basis since 2018.
- [Climate services dashboard](#), will be updated ahead of COP29, for the launch of the 2024 State of Climate Services report is launched to reflect the new dataset.

### **Reflects regional, national and local circumstances**

Recalling CMA 1.11/2018 and [Resolution 21 \(Cg-18\)](#) the data is used for “regular assessments of service delivery at global, regional and national scales and publishing a “[State of climate services](#)” report on annual basis” as well the Climate policy sections of the WMO flagship reports of the State of the Climate in [Africa](#), [Asia](#), [South West Pacific](#), [Europe](#) and [Latin America and Caribbean](#).



### **Potentiality to be aggregated**

This indicator can be aggregated with information about use of climate science information for action as well as the information on investments on climate finance, to identify gaps of climate adaptation finance to support enhancement of Parties adaptive capacities.

### **Team of experts**

Expertise on assessing/verifying the adaptive capacity is available in WMO's Expert Team on Capacity Development for Climate Services (ET-CDC), as a subsidiary body of the Services Commission (SERCOM).

### **Areas potentially not covered by existing indicators and for which the development of new indicators may be needed**

- Indicator on the assessment of socio-economic benefits of climate services