SOFF
Systematic Observations
Financing Facility

Weather and climate information for the global public good

Systematic Observations Financing Facility (SOFF)

Terms of Reference
EXECUTIVE SUMMARY

WMO

UNDP

UN environment programme

Foreword

The climate crisis is rapidly accelerating. The Sixth Assessment Report of the United Nations (UN) Intergovernmental Panel on Climate Change (IPCC) provides evidence of intensifying climate change intensifying across the globe and of the need to act with much greater urgency. Greenhouse gas emissions have been growing more rapidly than ever expected and the impacts are now visible everywhere, including record-breaking temperatures, and increased floods and wildfires. Indeed, according to the World Meteorological Organization (WMO) Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes, the number of disasters has increased by a factor of five over the past five decades, and economic losses have increased sevenfold with average daily losses of USD 383 million.

Thus, there is an urgent need to enhance the level of ambition on climate mitigation and adaptation. The UN Environment Programme's (UNEP) 2020 Adaptation Gap Report estimates that annual adaptation funding needs in developing countries are expected to increase by up to USD 300 billion by 2030, and by up to USD 500 billion by 2050. This means that the current level of finance would need to increase tenfold by the end of this decade to meet the expected needs.

The UN Secretary-General has called for a breakthrough on climate adaptation and climate finance. This will require new instruments, actors and innovative solutions through which adaptation finance can be delivered. It will also need to be underpinned by the best available science and data.

However, there are currently large data gaps in basic weather and climate observations, negatively affecting the quality of weather forecasts and climate prediction everywhere. Closing these data gaps, especially in Small Island Developing States (SIDS) and Least Developed Countries (LDCs), is essential for the world to be better prepared and to effectively adapt to a changing climate.

At COP25 in 2019, the major development and climate finance institutions formed the Alliance for Hydromet Development to scale up and unite efforts to generate better weather forecasts, early warnings, and climate information. As its first priority, the Alliance committed to establishing the Systematic Observations Financing Facility (SOFF) to close the weather and climate observations gap including through innovation. In short, SOFF aims to massively boost the international exchange of basic surface-based observational weather and climate data, benefiting SIDS and LDCs in particular.

The development of SOFF has benefited from the contributions of many partners and stakeholders, and support for its creation has been rapidly growing - from beneficiary countries to heads of international organizations. As members of the Alliance, the WMO, the UN Development Programme (UNDP) and UNEP have decided to co-create the SOFF and establish it as a United Nations Multi-Partner Trust Fund.

We invite all funding partners to join our efforts and to contribute to the SOFF UN Multi-Partner Trust Fund.

Petteri Taalas
Secretary-General
World Meteorological Organization

Achim Steiner
Administrator
United Nations Development Programme

Inger Andersen
Executive Director
United Nations Environment Programme

Executive Summary

SOFF will strengthen climate adaptation and resilient development by improving weather and climate observations that in turn support better weather forecasts, early warning systems and climate information services to save lives and livelihoods and protect property. SOFF aims to achieve this goal through sustained collection and sharing of high-quality surface-based (any observing system not deployed in space) weather and climate observations in compliance with the internationally agreed Global Basic Observing Network (GBON), leading to improved weather and climate prediction products.

SOFF will contribute to improvements in the global understanding of past and current climate, and in the prediction and projection of future climate scenarios. The improved quality of observations supported by SOFF is essential for the implementation and monitoring of the Paris Agreement. They will contribute to monitoring and assessment (through the Global Stocktake of the Paris Agreement and WMO annual State of the Global Climate report), including global temperature trends, and the overall impact of Nationally Determined Contributions (NDCs) on the climate system, as well as to the identification of needed action to increase ambition.

All monitoring and prediction of weather and climate start from the collection and global exchange of observations – these data provide the only source of knowledge about the atmosphere and the climate system. Weather and climate are inherently global, and to understand and predict them anywhere, observations from even the farthest reaches of the globe need to be made available to the global monitoring and prediction model systems.

Global observations and exchange, as well as prediction, are foundational elements of the meteorological value chain. Failure to deliver upstream global inputs severely affects the quality of local weather and climate prediction and limits the ability of all countries to adapt effectively to climate change and promote resilient development. Observations and their exchange have to be addressed on a global basis and they are essential for the effective deployment of downstream or "last mile" components of the chain – local data processing and weather forecasting, delivery of weather and climate services, and effective climate action.

The current coverage of surface-based observations falls far short of what is needed for robust weather and climate prediction, especially in the Small Island Developing States (SIDS) and Least Developed Countries (LDCs) due in part to their severe financial resource limitations. The international development community has been concerned about the lack of surface-based observations for decades, and many attempts have been made to address the problem. However, the experience so far has not been encouraging: Investments made in observing systems over the last three decades have generally not resulted in a significant and sustained increase in observational data exchange and the situation continues to deteriorate. For Africa, for example, the number of radiosonde observations provided to the global models decreased by roughly 50% between 2015 and early 2020 and has dropped further since.

There are five primary causes of missing observations in SIDS and LDCs:

- Lack of a global approach to address the global nature of the problem
- Lack of an appropriate measure of success
- Lack of a long-term and systematic approach to strengthen capacity
- Lack of a coordinated and integrated implementation approach
- Lack of a realistic financing model

The creation of SOFF responds to a global call for action to address the problem of missing weather and climate observations. The Sustainable Development Goals, the Paris Agreement and the Sendai Framework for Disaster Risk Reduction all call for action to deal with resilient development, climate change and early warnings, including better weather and climate data, prediction and response. In addition, the United Nations Framework Convention on Climate Change (UNFCCC) Subsidiary Body for Scientific and Technological Advice (SBSTA) has recognized the importance of sustained systematic observations and the need for financial support, while the most recent World Development Report, a study by the World Bank, WMO and the UK Met Office, and a recent working paper published by the Global Commission on Adaptation (GCA) have stressed the importance of improving weather and climate observational data. World leaders, including the United Nations Secretary-General, the leaders of the Alliance for Hydromet Development, heads of government and representatives of SIDS and LDCs have all called for better observations and the creation of SOFF.

In 2019 the 193 member states and territories of WMO established GBON and in 2021 adopted its detail regulations to address the problem of missing observations with substantial global benefits. GBON defines in clear and quantitative terms the commitments of the WMO Members to acquire and internationally exchange basic surface-based observations. The potential benefits directly enabled by the full implementation of GBON, via its implementation in countries with the largest current data gaps, are estimated to exceed USD 5 billion per year. According to a recent study from the World Bank, WMO and the UK Met Office, every dollar invested in GBON would help unleash additional economic benefits at a benefit-cost ratio of over 25:1.

In support of GBON implementation, the SOFF concept and design were developed through intensive consultations, bringing together many stakeholders, including over 30 international organizations. The SOFF consultations and design process have included (i) the establishment of five multi-stakeholder working groups; (ii) formal intergovernmental consultations and decisions taken through the WMO constituent bodies; (iii) in-depth assessments with selected countries; (iv) engagements with the Group of Least Developed Countries, the Alliance of Small Island States (AOSIS), the African Group of Negotiators, the African Ministerial Conference on Meteorology (AMCOMET); (v) consultations with the insurance sector and the Hydro-Meteorological Equipment Industry (HMEI); and (vi) regional consultations with the Global Network of Civil Society Organizations for Disaster Reduction (GNDR).

SOFF supports the implementation of GBON by addressing in a systematic manner the persistent problems causing missing observations. SOFF will ensure that SIDS and LDCs have the capacity and financing to deliver on their GBON commitments. SOFF (i) deploys a global approach with sustained international data exchange as a measure of success; ii) provides innovative finance for sustainable GBON compliance (iii) enhances technical competency and coordination; and (iv) leverages partners' resources. Through the combination of these features, SOFF channels international support to strengthen countries' basic observation capacity and the sharing of data in new, more effective and sustainable ways.

SOFF plays a pivotal role in contributing to the provision of a basic global public good critical to catalyzing private sector investments in value-added weather, climate and disaster risk products and tailored services to all sectors. The principle of open and unrestricted international exchange of observations that underpins GBON and SOFF allows SOFF funds to leverage private sector capabilities without jeopardizing the provision of an essential public service such as free and unrestricted access to weather and climate data. Public-private partnerships are expected to be fostered through SOFF in two ways: (i) through the use of flexible business models for private sector role in the operation and maintenance of GBON; and (ii) through the promotion and use of SOFF outcomes - improved weather and climate prediction - by SOFF Implementing Entities, funders, and Advisory Board members as enablers of public-private partnerships in other downstream initiatives that they support.

SOFF has a well-defined theory of change. Support is provided in three phases with outputs designed to achieve sustained GBON compliance as an outcome. This in turn contributes to the goal of strengthened climate adaptation and resilient development through improved weather forecasts, early warning systems and climate information services crucial to save lives and livelihoods and protect property. The three phases of SOFF support include:

- The **Readiness Phase**, during which SIDS, LDCs and other Official Development Assistance (ODA)-eligible countries can access analytical and advisory assistance provided by national meteorological services as peer advisors to define their GBON gap and to develop a GBON National Contribution Plan.
- The **Investment Phase**, during which SIDS and LDCs receive grants for investments and advisory support to establish the network of GBON stations and strengthen human and institutional capacity for GBON compliance.
- The **Compliance Phase**, during which SIDS and LDCs receive results-based fianance in support of operation and maintenance expenses for GBON data-sharing compliant stations.

SOFF has a simple, but inclusive and focused governance structure that helps achieve sustained GBON compliance through the effective collaboration of many stakeholders in new ways. The governance structure takes advantage of the competencies and unique value proposition of the institutions that collaborate under the SOFF umbrella.

SOFF is structured as a "UN coalition fund". WMO, the UN Development Programme (UNDP) and the UN Environment Programme (UNEP) are the co-creators of the fund. The nature of SOFF as a joint UN initiative increases its effectiveness, reach and impact.

The co-creators of the fund play well-defined complementary roles. WMO serves as the SOFF technical authority and Steering Committee co-chair and co- decision maker, jointly with the funding partners. It also administratively hosts the SOFF Secretariat. UNDP and UNEP are co-chairs of the multi-stakeholder Advisory Board, participate in the Steering Committee, and serve as SOFF Implementing Entities.

SOFF is established as a UN Multi-Partner Trust Fund (UN MPTF) administered by the UN MTPF Office. Based on a careful assessment of institutional alternatives, SOFF is set up as a fund managed by the UN MPTF Office, which administers pooled financing instruments for the UN currently totaling more than USD 15 billion in 139 countries. The UN MPTF offers the required flexibility, simplicity and speed for the operation and financial administration of the Facility. SOFF benefits from existing, pre-cleared Standard Legal Agreements, including with many potential funders.

The SOFF governance structure consists of a Steering Committee as the decision-making body, a multi-partner Advisory Board to advise the Steering Committee, a SOFF Secretariat to manage SOFF operations, the UN MPTF Office as trustee, and Implementing Entities, consisting of members of the Alliance for Hydromet Development (selected Multilateral Development Banks and UN organizations).

SOFF supports and leverages the investments of the members of the Alliance for Hydromet Development and other partners throughout the meteorological value chain. It does so through (i) standardized peer-to-peer country assessments and advisory services; (ii) partnership with Implementing Entities that embed SOFF investments into their larger projects and blend their resources with SOFF resources; and (iii) collaboration and coordination in the SOFF multi-stakeholder governance.

SOFF funding also contributes to increasing the effectiveness of downstream hydromet and climate investments by Implementing Entities and other partners.

Preliminary operational modalities for SOFF have been defined subject to further development and approval by the SOFF Steering Committee. These modalities include country eligibility and prioritization, detailed arrangements for the three operational phases, monitoring and evaluation, the role of the private sector and risk management. SOFF relies on the social and environmental safeguards, grievance redress mechanisms and gender policies of the SOFF Implementing Agencies. In addition, the Facility will design and implement a gender action plan to ensure that gender considerations are systematically applied in all its activities.

SOFF will be operationalized in three periods designed to achieve sustained GBON compliance of all SIDS and LDCs over 10 years.

(i) During the 6-month **Start-up Period**, the SOFF Secretariat will be structured, operational modalities further developed and additional resources mobilized. This period will end with the first meeting of the Steering Committee.

(ii) The SOFF Start-up Period will be followed by a three-year **First Implementation Period** during which the readiness phase will be undertaken in up to 55 countries, the investment phase initiated in up to 28 countries, and results-based financing provided for an estimated 200-400 GBON compliant stations.

(iii) The subsequent **Expansion and Sustaining Period** will aim to achieve the goal of full and sustained GBON compliance in 75 SIDS and LDCs, incorporating lessons from the First Implementation Period, especially from an independent evaluation which will be undertaken during the third year of that period. Beyond the 10-year horizon, continued SOFF support will likely be needed to sustain GBON compliance in many SOFF eligible countries.

(iv) **SOFF requires USD 200 million for the First Implementation Period**, based on the expected number of countries and stations to be supported and estimates of average costs per country and station. This USD 200 million will fund the readiness, investment, compliance operational activities and administrative expenses of SOFF for the first three years of operation. Resource requirements for the Expansion and Sustaining Period will be determined based on the experience of the First Implementation Period. Resource mobilization beyond that period will likely follow a regular replenishment approach, with the first replenishment envisaged to be completed in the third year of the First Implementation Period.

To ensure an effective startup of SOFF, a minimum capitalization of USD 50 million is targeted. This initial capitalization allows for (i) the establishment of a SOFF Secretariat at a minimum critical mass; (ii) SOFF programme delivery, focused on priority activities, especially those where quick wins are possible to rapidly demonstrate impact in local and global prediction products; and (iii) continuation of active resource mobilization.

SOFF

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For more information on SOFF click here

For more information on the Alliance of Hydromet Development click here

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