



SOFF

Systematic Observations
Financing Facility

Weather and climate information for the global public good



SYSTEMATIC OBSERVATIONS FINANCING FACILITY (SOFF)

Draft Terms of Reference





About

This document presents the draft Terms of Reference of the Systematic Observations Financing Facility (SOFF) UN Multi-Partner Trust Fund.

It is the result of an intensive two-year participatory process to which many stakeholders contributed. It reflects the outcomes of the SOFF first and second potential Funders' Forums that took place in March and June 2021. The SOFF team is grateful for the support and inputs received from all stakeholders.

The document provides the basis for discussions and feedback at the third forum for potential funders, virtually taking place on 27 September 2021. The SOFF Terms of Reference will be finalized in early October and will serve as the basis for the SOFF Pledging Forum on 28 October 2021 and subsequent resource mobilization.

13 September 2021

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 climate change intensifying across the globe and 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.

On the road to COP26, the UN Secretary-General has called for a breakthrough on climate adaptation and on 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, 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.

The objective is to announce the creation of SOFF at COP26. To achieve this objective, additional support from bilateral and multilateral funding partners is needed. With this report, we are pleased to share the SOFF draft Terms of Reference with potential funders and stakeholders for discussion at the Third Funders' Forum. Based on these inputs, the SOFF Terms of Reference will be finalized in advance of the Pledging Forum scheduled for 28 October 2021.

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



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Acronyms

AMCOMETAfrican Ministerial Conference on Meteorology
AMMAAfrican Monsoon Multidisciplinary Analysis
AWS	.....Automated Weather Stations
CHD	.....Country Hydromet Diagnostics
COP26	.....Twenty-Sixth session of the Conference of the Parties
CREWS	.....Climate Risk and Early Warning Systems Initiative
CSI	.....Country Support Initiative
ECMWF	.....European Centre for Medium-Range Weather Forecasts
EEZ	.....Exclusive Economic Zone
EUMETNET	.....European National Meteorological Services
FCS	.....Fragile and Conflict-affected States
GBON	.....Global Basic Observing Network
GCF	.....Green Climate Fund
GEF	.....Global Environment Facility
HMEI	.....Association of Hydro-Meteorological Equipment Industry
IMF	.....International Monetary Fund
IPCC	.....Intergovernmental Panel on Climate Change
LAM	.....Limited Area Model
LDCs	.....Least Developed Countries
MDBs	.....Multilateral Development Banks
NMHSs	.....National Hydrological and Meteorological Services
NWP	.....Numerical Weather Prediction
OECD	.....Organization for Economic Co-operation and Development
OECD DAC	.....OECD Development Assistance Committee
OECD ODA	.....OECD Official Development Assistance
REAP	.....Risk-Informed Early Action Partnership
SBSTA	.....UNFCCC Subsidiary Body for Scientific and Technological Advice
SIDS	.....Small Island Developing States
SOFF	.....Systematic Observations Financing Facility
SPREP	.....Secretariat of the Pacific Regional Environment Programme
UN MPTF	.....UN Multi-Partner Trust Fund
UNDP	.....United Nations Development Programme
UNEP	.....United Nations Environment Programme
UNFCCC	.....United Nations Framework Convention on Climate Change
UNHLPF	.....UN High-level Political Forum
WDQMS	.....WIGOS Data Quality Monitoring System
WFP	.....World Food Programme
WIGOS	.....WMO Integrated Global Observing System
WMO	.....World Meteorological Organization



Executive Summary

The 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 that save lives and livelihoods and protect property. SOFF will achieve this goal through sustained collection and sharing of high-quality surface-based 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 report¹), 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 upstream 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 forecasts and predictions, 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, 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,² a study by the World Bank, WMO and the UK Met Office,³ and a recent working paper published by the Global Commission on Adaptation (GCA)⁴ have stressed the importance of improving weather and climate observational data. World leaders, including the United Nations Secretary-General, the Managing Director of the International Monetary Fund (IMF), the leaders of the Alliance for Hydromet Development,⁵ heads of government and representatives of SIDS and LDCs have all called for better observations and the creation of SOFF.⁶

In 2019, the 193 member states and territories of the World Meteorological Organization (WMO) committed to establishing GBON 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 the World Bank, WMO and 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 will support 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, incentives and financing to deliver on their GBON commitments. SOFF will (i) deploy a global approach with sustained international data exchange as a measure of success; ii) provide innovative finance for sustainable GBON compliance (iii) enhance technical competency and coordination; and (iv) leverage partners' resources. Through the combination of these features, SOFF will channel international support to strengthen countries' basic observation capacity and the sharing of data in new, more effective and sustainable ways.

SOFF has a well-defined Theory of Change. Inputs will take place in three phases with defined outputs designed to achieve sustained GBON compliance as an outcome. This in turn will contribute to the ultimate goal of strengthened climate adaptation and resilient development through improved weather forecasts, early warning systems and climate information services crucial to save lives and protect property. The three phases of SOFF support include:

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

SOFF will have a simple, but inclusive and focused governance structure that will help 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 will collaborate under the SOFF umbrella.

SOFF will be structured as a “UN coalition fund”. WMO, the UN Development Programme (UNDP) and the UN Environment Programme (UNEP) will co-create the fund. The nature of SOFF as a joint UN initiative will increase its effectiveness, reach and visibility.

SOFF will be established as a UN Multi-Partner Trust Fund (UN MPTF). Based on a careful assessment of institutional alternatives, SOFF will be 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 creation of the Facility. SOFF will benefit from existing, pre-cleared Standard Legal Agreements, including with many potential funders. The SOFF MPTF will be legally established by late October 2021 to accommodate contributions that can be made this year.

The SOFF governance structure will consist 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, a UN MPTF Trustee, and Implementing Entities, consisting of members of the Alliance for Hydromet Development (currently, selected Multilateral Development Banks and UN organizations).

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

SOFF will support and leverage the investments of the members of the Alliance for Hydromet Development and other partners throughout the meteorological value chain. It will do so through (i) standardized peer-to-peer country hydromet assessments and advisory; (ii) partnership with Implementing Entities that will 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 will also improve the effectiveness of downstream hydromet 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, once SOFF is established. 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 will rely on the social and environmental safeguards, grievance redress mechanisms and gender equality policies of the Implementing Agencies.

Based on feedback from potential funders 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-months **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) 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 will be provided for an estimated 200-400 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 engagement 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 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 tentatively envisaged to be completed in the third year of the First Implementation Period.

To ensure an effective startup of SOFF, it is estimated that a USD 50 million minimum capitalization will be required. This initial capitalization will allow for (i) the establishment of a SOFF Secretariat at a minimum critical mass; (ii) initiation of SOFF programme delivery, focused on priority targets, especially those where quick wins are possible to rapidly demonstrate the impact of SOFF; and (iii) continuation of active resource mobilization.

Achieving sustained compliance with the GBON regulations and hence a sustained improvement in the international exchange of observational data will require substantial investments, strengthened capacity and long-term resources for operation and maintenance in many countries. To close their GBON gaps, the observations in SIDS and LDCs need to increase 28 times over their current levels for surface stations and 12 times for upper air stations. Achieving this ambitious goal with the urgency needed requires an accelerated and dedicated international effort. SOFF responds to this critical need.

1.

Introduction

SOFF is a new financing mechanism that aims to support and accelerate the sustained collection and international exchange of the most essential surface-based weather and climate observations in compliance with the internationally agreed GBON (see section 3.1). The implementation of GBON in SOFF-supported countries will allow for a major strengthening in the provision of high-quality weather forecasts, early warning systems and climate services at global, regional, national and local levels. The improvement in the quality of weather and climate information services will bring about a substantial enhancement of action for resilient development and climate adaptation, resulting in lives and livelihoods saved and property protected.

This document provides the basis for discussions at the third forum for potential funders of the SOFF, virtually taking place on 27 September 2021. It presents the draft Terms of Reference of the SOFF UN Multi-Partner Trust Fund. It outlines the rationale and value proposition, the core institutional and operational elements of SOFF and forward-looking information regarding the next steps for the creation and capitalization of the Facility in the coming months.

The document reflects the outcomes and feedback obtained during the SOFF first and second potential funders' forums, as well as the results of intensive consultations and decisions taken with beneficiary countries, the WMO constituencies, development partners, the Alliance for Hydromet Development and other relevant stakeholders for over two years. It incorporates key elements of the reports presented at the first and second potential funders' forums. New elements include:

- a further updated governance structure of SOFF, ensuring synergies and complementarities with other initiatives (section 7)
- a description of the archetypal business models for the role of the private sector in SOFF implementation (section 8.5) and
- a proposal for structuring SOFF implementation and resource mobilization through a modular and risk-based approach (section 9), guided by clear prioritization criteria (section 8.3)

The objective of the Third Funders' Forum is to further discuss and advance the definition of the Terms of Reference for SOFF as presented by this draft report.

The final version of this document is expected to be endorsed at the SOFF Pledging Forum to take place on 28 October 2021. This document will serve as the Terms of Reference that will underpin the formal creation of SOFF and will inform potential funders, partners, recipient countries and other stakeholders about what to expect from the Facility.

2.

Importance of observations

All monitoring and prediction of weather and climate start from 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 even from the farthest reaches of the globe are needed. However, merely making the observations is not enough – in order to make effective use of them for monitoring and prediction, the data need to be made available to the global model systems used for monitoring and prediction.

In this section, the main elements of the meteorological value chain are presented, with the emphasis on its initial, global links. These include observations, data exchange, and global numerical prediction models. The role of observations is described, with a focus on the consequences of having an insufficient quantity and quality of them, both locally and globally.

2.1 Predicting the weather, an inherently global problem

Weather and climate services are generated by the meteorological value chain (figure 1). Good outcomes – users taking action in response to weather and climate prediction, resulting in lives and livelihoods saved, protection of property, and increased economic activity – happen when all links in the chain work and are working effectively together. This value chain can be schematically described as follows:

1. **Weather and climate observations** are routinely made over all areas of the globe.
2. **Observations are exchanged internationally**, in particular with global Numerical Weather Prediction (NWP) systems (box 1).
3. **NWP output monitoring and prediction data** for weather and climate are generated and shared with all WMO Members (193 countries and territories).
4. **Global NWP output is used** by National Hydrological and Meteorological Services (NMHSs) and other entities, including in the private sector, to generate weather and climate information: i.e., local forecast products, watches and warnings, seasonal outlooks, climate monitoring and prediction products, etc.

- 5. **Weather and climate information services are delivered to users**, including national and local authorities, businesses, media, academia and the general public.
- 6. **Effective decisions** in response to weather and climate information are made by authorities, agents in all economic sectors, and individuals.



Figure 1. The meteorological value chain: All links in the chain must operate effectively to yield success. Source: WMO Secretariat, 2021

The global nature of weather and climate implies that unless the first three links of the value chain are functioning, the last three links will be missing needed input and will not be able to deliver the expected outcomes. The first three links in the value chain (shown in red) constitute the global meteorological infrastructure and rely on a global implementation approach (box 1). In contrast, the last three links (in blue) are typically implemented nationally. The importance of the global nature of the first three links cannot be overstated. For a prediction horizon beyond 24 to 36 hours, the use of global observational data and global models to underpin the predictions in any location is needed, even if the target area for a given prediction is very small and local (box 2). Conversely, without local efforts everywhere to make and exchange observations, the models cannot generate the data needed for effective forecasting at the national and local levels. All countries, therefore, share an interest in the first three links in the chain, while they handle the last three primarily individually. “Last-mile” projects predominantly invest in the last three links, due to the perception that this is where the value is created. However, without complementary investments in the first three links, investments in the last three will often not have the expected benefits.

Box 1. A primer on monitoring and predicting the Earth's atmosphere

Weather and climate prediction is global by necessity, not by choice. Weather systems develop and move across the planet regardless of political boundaries. The atmosphere has no horizontal boundaries and only in its entirety can it be simulated mathematically.

The foundation of all weather and climate monitoring and prediction is global NWP done by the Global Producing Centres that are operated by WMO Member states and territories. An NWP prediction starts by assimilating vast amounts of meteorological observations from the entire globe into an Earth system model to build a worldwide model estimate of the instantaneous weather. The model then uses the laws of physics to evolve this "initial weather" forward in time. The quality of NWP output can be objectively quantified, and progress in NWP relies on extensive use of broadly agreed measures of lead time, or *range* - the extent forward in time that can be predicted -, and *skill* - the quality of the prediction at a given time.

The only practical way to limit the errors – in other words, to improve the range and skill of the prediction – is to ensure that the "initial weather" of the model is as accurate as possible everywhere, and this can only be achieved with frequent observations made everywhere. The ability to accurately predict the weather is limited by what is known as the "butterfly effect". The impact of the butterfly effect is profound: Any small, local gaps or errors in our knowledge of weather anywhere will propagate and amplify in the models, eventually degrading forecast skill everywhere.

The international exchange of observations is therefore just as important as the observations themselves – observations that are not made cannot be exchanged, and observations that are not exchanged have no value for prediction.

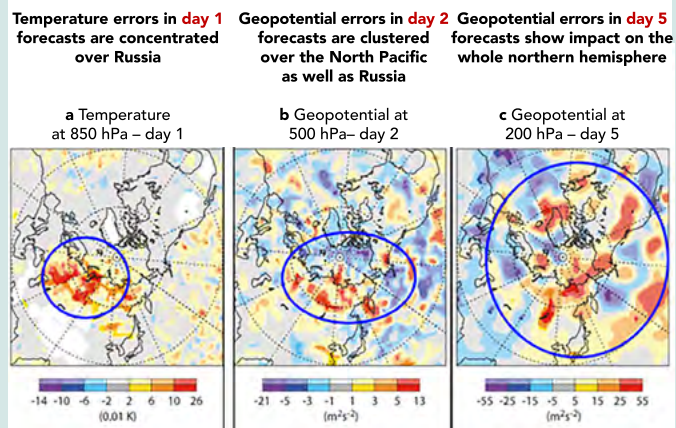
Box 2. The value of observations beyond national boundaries

Balloon-borne radiosondes remain the single most important source of observations for numerical weather prediction and climate analysis. Even a large country like the US relies on surface-based observations obtained from far beyond national borders for specific prediction needs. This is evidenced by the long-standing US funding for radiosonde observations in the Marshall Islands, in the Federated State of Micronesia and the Caribbean as well as by the Winter Storms Reconnaissance program providing drop-sonde (radiosondes deployed from aircraft) coverage over the North Pacific.

The following are some examples that demonstrate the importance and impact of radiosonde observations beyond national boundaries.

Russian radiosondes in 2015.

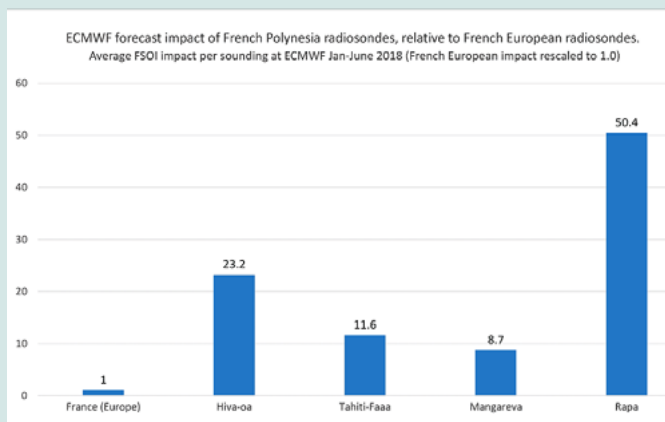
Russia had to cut its radiosonde programme from two ascents per day to one in 2015. The European Centre for Medium-Range Weather Forecasts (ECMWF) analysis pictured on the right shows the significant negative impact of the reductions in radiosondes on forecast skill over the entire Northern Hemisphere (darker colors indicate a greater impact on performance).



(Source: Adapted from ECMWF, 2015)

Global impacts: radiosondes in the Pacific.

The NWP systems can provide very detailed analyses of the statistical impact on forecast skill of observations by type, and by location. The impact on NWP skill especially of isolated radiosonde observations in remote locations can be very large. The graph shows that the impact on forecast skill, measured globally, of radiosondes launched over French Polynesia is up to 50 times larger than the impact of similar observations made over Europe.

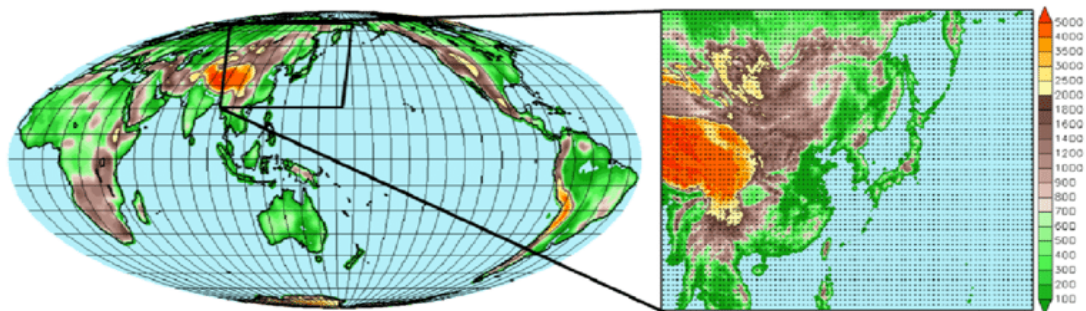


(Source: Adapted from ECMWF, 2018)

Even though all weather prediction starts with global models, the information needed for weather and climate services is often highly local. Questions like “What is the likelihood of rain over my fields tomorrow? Will the approaching hurricane hit my city, or will it make landfall 50 km up the coast? How high will our new sea wall need to be? Will my village be able to base its economy on its current crops 10 years from now?” are examples that all require highly localized information for their answers.

Detailed local information about weather and climate is provided by downscaling of global model output, typically obtained by using a fine-scale Limited Area Model (LAM) as a “magnifying glass” within the global model (figure 2). The LAM has a finer grid-mesh than the global model and is thus able to better represent the local geography – topography, coastline, land use, etc. – and as a result also the interaction between the surface and the atmosphere.

However, even in LAM-based approaches, the outer, global model remains the primary source of observational information for the local domain. This central role played by the global model means that the effect of missing local observations will cascade down to the smallest scales, and the supply of local observations to the global model is thus critical to the success of the method. Downscaling will not work unless the global model already has an accurate representation of the weather patterns over the LAM area – a magnifying glass cannot by itself add new information, nor can it correct any wrong information.



Global Model

Limited Area Model

(Detailed representation of local geography)

Figure 2. Downscaling of weather and climate information via nesting of limited area model within global model. Source: WMO Secretariat, 2021

2.2 Economic benefits of the global meteorological infrastructure

A recent working paper⁷ published jointly by the World Bank, WMO and the Met Office of the United Kingdom provides an estimate of the economic benefits of the international exchange of observations via an assessment of the contribution of surface-based observations to NWP skill. It must be emphasized that any economic benefits from weather and climate services result from the operation of the entire value chain shown in figure 1 and that the impact of observations or observational data exchange, therefore, cannot be estimated in isolation. However, as shown in the paper there is overwhelming scientific evidence that the continued lack of surface-based observations in many parts of the world is currently the primary bottleneck limiting further improvements in NWP skill, and that addressing this problem would result in immediate benefits. The paper further estimates the improvement in NWP skill that would result from achieving worldwide full compliance with GBON regulations, and proceeds to translate this improvement into economic benefits via a forward projection of the current economic benefits mentioned above.

Since NWP is the basic engine behind all weather and climate services, its quality measures, skill and especially range, can be translated into economic terms. For instance, the safety of life in extreme weather situations typically depends on forecasting skill in the short-range, as do the safety and efficiency of air and land transportation as well as the efficiency of sectors like renewable energy generation. Protection of assets and property and safety, and efficiency of marine transportation depend on longer range, and sectors such as agriculture and water management even longer range. Climate analysis and prediction underpinning adaptation and resilience activities use yet longer time horizons.

The potential benefits directly enabled by the full implementation of GBON, primarily via its implementation in countries with the largest current data gaps, are estimated to exceed USD 5 billion per year. Based on the overall GBON cost estimates used in the paper, every dollar invested in GBON would help unleash additional economic benefits at a benefit-cost ratio of over 25:1, i.e., for every dollar invested, at least twenty-five US dollars in socio-economic return could be realized.

Weather and climate observations are essential to fully realize the USD 162 billion of estimated minimum annual socio-economic benefits of weather and climate prediction (table 1). Potential global disaster management benefits are estimated at USD 66 billion per year and about USD 96 billion are the estimated annual benefits of improved economic production through the application of weather forecasting in highly weather-sensitive sectors including agriculture, water, energy, transportation and construction. The analysis does not include the many lives saved due to enhanced weather and climate prediction. In addition, there is a wide range of other benefits generated by improved weather prediction, many of which were not considered in the above global assessment of economic benefits, such as increased business and capital investment, fiscal stability and reduced future debt exposure, and ecosystem-based co-benefits.

Table 1. The minimum annual socio-economic benefits of weather prediction from both avoided losses through disaster management (in green) and increasing productivity in different sectors (in blue). Source: Adapted from Kull, et al., (2021)

Sector	Minimum annual benefit (USD)
Disaster Management	66 billion
Agriculture	33 billion
Energy	29 billion
Transportation	28 billion
Water Supply	5 billion
Construction	1 billion
TOTAL	162 billion

2.3 Reanalysis – Numerical Weather Prediction is the basis for climate monitoring and prediction

Not only weather prediction, but nearly all climate prediction, and to an increasing extent climate monitoring, is based on NWP. Climate monitoring and prediction, through the use of reanalysis, share many of the same weather observational requirements. As described in box 1, each NWP run starts by updating the model estimate of the “initial weather” based on the most recent observations. The process of blending observations into the model at regular intervals is called data assimilation and the resulting model estimates of the initial weather are called “analyses”.

Over time, a global NWP system will generate a long sequence of analysis datasets that contain a complete history of the global weather. These datasets are immensely valuable for a range of climate applications that cannot use “raw” observations directly. However, periodic system upgrades (model changes, processing methods, etc.) introduce artificial jumps and other inconsistencies that limit the use of these datasets for climate monitoring purposes in particular. To create consistent data records, it is necessary to conduct reprocessing, or *reanalysis*, of archived observations using a fixed configuration of the NWP system.

Today, reanalysis products provided by the global NWP centres are becoming the most-used datasets for climate studies. They are used to calibrate and verify climate prediction and to help develop, test and validate models used for long-range climate projections.

The lack of observations severely limits the ability of countries and their development partners to effectively plan and to adapt to climate change, and to design and implement meaningful and effective adaptation projects. The quality of reanalysis data is measured using the same measures (skill and range) used for weather prediction, and the observational data required for weather prediction and many climate applications are largely the same. In addition to generating poor quality weather forecasts, the knowledge about past and current climate and the ability to predict and project future climate scenarios will also be poor in areas where observations are missing.

2.4 Observations needed and their data sources

Weather and climate prediction requires observations of the state of the atmosphere, ocean, and land; these are obtained from a wide range of instrumentation deployed on land, in and above the ocean, in the air and space. The most important observations are those of the basic model state variables, namely wind, temperature, humidity, and surface atmospheric pressure. Table 2 below lists the primary sources, divided into two categories: Space-based, and surface-based.

Table 2. Observations of five primary predicted model variables needed everywhere on the globe, ideally at a horizontal density comparable to that of the model.

Source: WMO, 2021.

Variable	Source(s)	Details
Wind (two components)	Surface- and space-based	Space-based: Horizontal coverage Surface-based: Vertical structure
Temperature	Surface- and space-based	Space-based: Horizontal/vertical coverage Surface-based: Detailed vertical structure
Humidity (water vapor concentration)	Surface- and space-based	Space-based: Horizontal/vertical coverage Surface-based: Detailed vertical structure
Surface atmospheric pressure	Surface-based	Surface-based only (not measured from space)

Satellites provide excellent and near-continuous data coverage but cannot alone meet the observational needs of NWP.

While satellites provide the vast majority of the observations used for operational NWP and are extremely important to the skill of these systems, table 2 reflects the fact that some basic measurements, in particular of the detailed vertical structure of the atmosphere and of surface pressure, cannot or will not in the foreseeable future be made from space. Furthermore, many satellite data are difficult to use over land, snow and ice surfaces, and the use of satellite data relies on a good distribution of surface-based measurements for anchoring, calibration and validation.



3.

The problem of missing observations

Ongoing monitoring by WMO of the observational data exchange reveals that the current data coverage falls far short of the minimum requirements to support robust weather and climate prediction, especially in SIDS and LDCs. This section demonstrates the need for WMO to provide clarity on the expectations for data delivery and the need for the global community to provide financial and technical assistance to support observing systems in the poorest and most poorly observed areas of the globe. Regarding the former, 193 WMO Members have committed to the implementation of GBON, which will clarify the commitment to the acquisition and international exchange of a certain minimum required set of observations as input to global NWP. Regarding the latter, the creation of SOFF is a commitment of the Alliance for Hydromet Development to provide technical and financial support for the implementation of GBON in particular in SIDS and LDCs.

Despite several decades of significant investments made in strengthening the meteorological sector in developing countries, many areas of the globe remain far from achieving the goal of continuous, robust, real-time international exchange of surface-based observations. Figure 3 shows the international exchange of in-situ observations of surface atmospheric pressure – a key input variable for all modeling – as of 9 September 2021. Observing stations shown in black (no observations exchanged) or red (sporadic exchange of observations) represent lost opportunities to serve the entire global population with better weather and climate data products. The local situation in countries with predominantly black or red stations – or with too few stations altogether, as shown by the predominantly white areas – is even more dire. In these areas, not only will it be nearly impossible to provide high-quality forecast products – in most cases it will be impossible even to assess how good or how bad those forecast products are since there are no observations against which they can be verified. Satellite observations can help ensure a realistic model representation of large-scale atmospheric dynamics in the upper layers of the atmosphere but cannot be used to verify forecasts of surface weather. Without the exchange of surface-based observations, the rest of the value chain has an inadequate base on which to build.

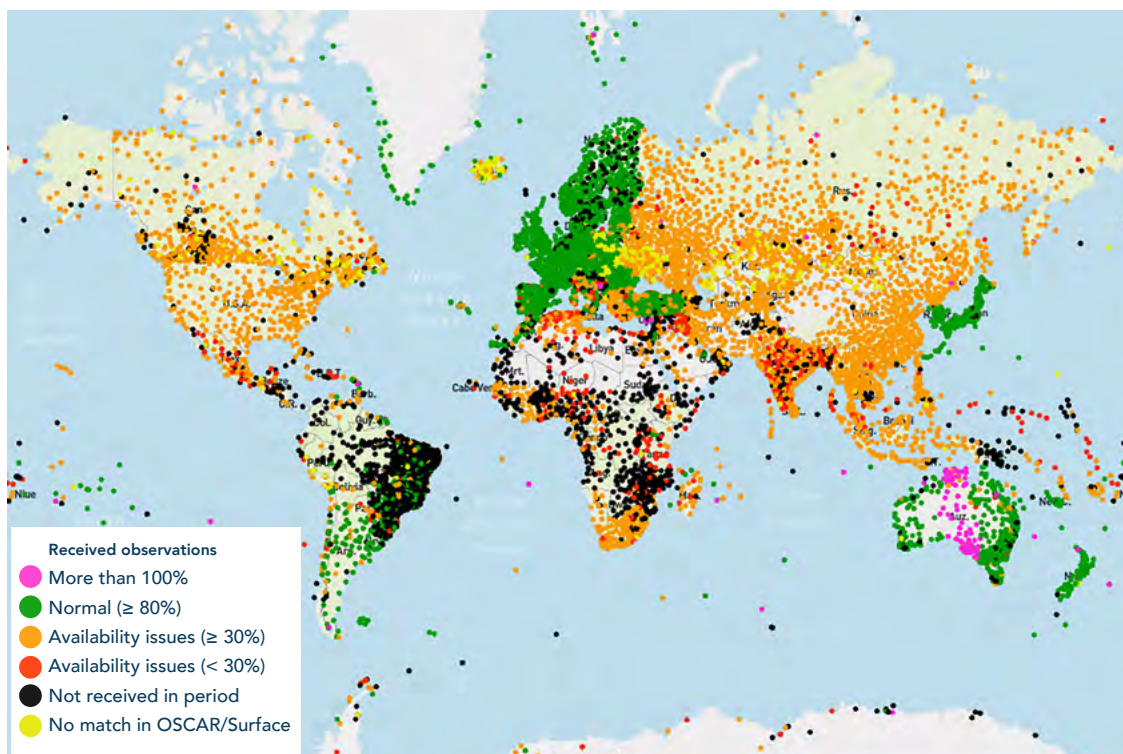


Figure 3. Surface pressure observations received by global NWP Centres on 9 September 2021. Source: WIGOS Data Quality Monitoring System

3.1 The Global Basic Observing Network (GBON)

In order to address the observational coverage gaps shown in figure 3 and help ensure a reliable supply of observational data of the most important variables (see table 2) to the NWP systems, 193 WMO Members (states and territories) decided in 2019 to commit to the implementation of GBON⁸ and to initiate the development of regulatory material for this network.

The GBON design is based on up-to-date observational requirements for Global NWP assembled by technical experts working under the WMO Commission for Observation, Infrastructure and Information Systems.⁹ Drawing on 20 years of NWP observational data impact studies coordinated by WMO, the GBON regulations specify 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 (for further detail see box 9).

The implementation of GBON will represent a major strengthening of the global observing capabilities, and the immediate result will be the availability of better model guidance for weather and climate monitoring and prediction at all spatial scales. This will enable the provision of vastly improved and enhanced weather and climate services at global, regional, national and local levels to all WMO Members. The improvement in service delivery capabilities will be especially large in the areas where the current coverage of observations is poor.

3.2 The causes of missing observations in SIDS and LDCs

Observational data are missing in many parts of the world (figure 3), but the data gaps have been particularly severe and persistent in SIDS and LDCs. The lack of observations acts as a bottleneck at the start of the value chain (figure 1) and limits the quality of forecasts and climate data products globally, but especially in areas from which observations are missing. This in turn limits the benefits from any investments in the downstream areas of the meteorological value chain.

The international community has been concerned about the lack of observations for decades, and many attempts have been made to address the problem.

Estimates indicate that members of the Alliance for Hydromet Development are currently managing an active hydromet¹⁰ project portfolio of at least USD 2.5 billion (not counting national or international co-financing), of which about USD 500 million¹¹ are aimed at improving observing systems in developing countries. Assuming an average project life cycle of five years, this would amount to an expenditure of USD 100 million per year. However, the experience has not been encouraging: Investments made in observing systems in developing countries over the last three decades have generally not resulted in a significant and sustained increase in observational data exchange. On the contrary, the data gap has been growing. For Africa, the number of radiosonde observations provided to the global models decreased by roughly 50% between 2015 and early 2020 and has dropped further since. This is a serious problem due to the fact that among all observations, radiosonde data routinely have the highest individual impact on NWP skill and that, especially in the tropics, the type of information they provide is difficult to obtain from other sources.

The substantial investments in observing systems have not translated into increased observational data sharing. Starting in 2013, WMO has held a number of regional workshops aimed at increasing the understanding of persistent problems limiting the functionality of the global observing system. The most frequently encountered issues, as stated by many of the countries participating in these workshops and echoed by major development and climate finance partners, can be grouped into five main problem areas:

- 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

3.2.1 Lack of a global approach to address the global nature of the problem

Development projects are typically single-country focused, and their response to observing system issues is, therefore, to attempt to establish national observational infrastructure. However, the action that is needed to establish a functioning data exchange is generally not purely national. It will involve collaboration with – and in many cases investment in – system components and entities outside the country such as Regional Telecommunication Hubs, Global Information System Centres, Regional WIGOS¹² Centres, all the way to the intended recipients of the observations, the Global Producing Centres running the NWP models. Therefore, single-country projects – even when successful in installing national networks – generally do not result in improved observational data exchange. Since observations that are not exchanged do not help substantially improve the prediction of the NMHSs, countries have no real incentive to maintain or even operate the delivered national networks once the projects are completed and the support ceases.

Last-mile projects rely heavily on the use of global model data, and while the importance of these data is well understood by those designing the projects, the role of local observations is less so. The critical link between the international exchange of local observations and the local quality of model data – including through their contribution to the quality of high-resolution down-scaled products – is generally not fully recognized, nor is the critical role played by observations as the only objective means of forecast verification. Furthermore, in small or medium-sized countries it is often the case that the observations that would be most important for their weather forecasts would need to come from outside their borders. Traditional single-country, last-mile focused projects with no control over, or even coordination with, projects in neighboring countries, therefore, often do not see a reasonable value proposition in investing in local observing systems. Ongoing failure to address this problem has been detrimental to the availability of radiosonde observations, especially over Africa.

3.2.2 Lack of an appropriate measure of success

While the lack of observations from developing countries is well recognized and frequently cited in climate project rationales and design documents, the lack of awareness of the critical role of data exchange has led to conflating the problem of missing data with the problem of missing international exchange of these data (box 3). Ultimately what matters is that observational data are internationally shared, not merely that observational hardware is installed and observations are generated. Therefore, it is key that the success of interventions is defined as the sustained international delivery of observational data to the NWP centres, not the mere completion of hardware installation and data generation projects.

The time-bound, single-country nature of projects leads to a focus on observing hardware investments. Issues around the delivery of observations, in particular international data exchange, are rarely addressed, since they are difficult, open-ended, and need to involve technical and financial support beyond the project cycle and collaboration with entities outside the project recipient country.

Box 3. Examples - lessons learned from past projects¹³

- **Multi-country hydromet project:** A climate readiness project completed in 2019 covering 11 countries in Sub-Saharan Africa made significant investments in upgrading observing system elements. The project's final evaluation assessed the upgraded observing systems elements as successful overall, with a good likelihood of sustainability. However, the WIGOS Data Quality Monitoring System (WDQMS)¹⁴ for May 2021 shows no data delivery from seven countries, very few data from two countries and reasonable data delivery only from the remaining two.
- **Single country hydromet development project in Africa:** A comprehensive network of 50 Automated Weather Stations (AWS) was installed in the country. The project was completed in 2019 and the final evaluation rated the project as successful. However, as of early 2021, no observations are available at the NMHS, no observations are being internationally exchanged, no standard data formats are in place, and the telecommunication capabilities are inadequate.
- **Multiple single-country projects within the same LDC:** Multiple donors and implementing entities are active within the same country, resulting in a very comprehensive "network of networks" of AWSs. Of 100 stations in total, only 50 were operating in June 2020. And for the operating stations, different vendors, different data formats and no common point of delivery have limited their effectiveness. Finally, the country's NMHS only has access to data from five stations, and of these, the WDQMS shows that only data from two stations are routinely exchanged.

3.2.3 Lack of a long-term and systematic approach to strengthen capacity

Short-term projects with tight milestones and delivery schedules are ill-suited to address systemic issues and cannot provide the necessary long-term support to ensure long-term operation and maintenance of the country's observing system.

For example, AWSs are seen by donors and implementing entities as a modern, high-efficiency, low-cost means of providing meteorological data, but in many developing countries the perception is rather different. Even after AWS networks have been

installed, many NMHSs in developing countries continue to rely on manual observations made by human observers and transmitted by outdated communication methods for meeting their WMO obligations. There are strong structural reasons behind this and institutional barriers that are not easily removed via short-term project approaches. AWS networks are often perceived as threats to job security among NMHS staff and there is no clear link between the data they provide, and the daily operations or quality of service provided by the NMHS.

While AWS networks may be officially welcomed by the recipient countries, the reality is that these networks have in many cases been orphaned from the outset and failed to gain traction in the beneficiary countries. Building and publicizing the links between the data they provide and the quality of local forecast products, managing the impact on employment prospects and expected qualifications of NMHS staff, and advocating for acceptance and support of the associated hardware in local communities all require a long-term commitment and technical and financial support beyond what can be provided by time-bound projects.

3.2.4 Lack of a coordinated and integrated implementation approach

In many cases, several development and climate finance initiatives have – more or less independently of each other – attempted to address the issue of missing observations via separate projects within the same country. Many beneficiary countries thus find themselves in situations with disparate observing networks relying on vendor support from different donor countries, providing data in different proprietary formats, requiring separate stocks of spare parts, etc. (box 3). This is not sustainable, and it would not be sustainable even for an NMHS in a developed country.

Operating and maintaining observing networks also require a coordinated approach for the provision of technical assistance. Many development partners providing support and investing in basic observations do not have sufficient in-house capacity to design and support the implementation of these projects. As a result, they draw on international consultants that often apply different approaches for different projects.

Engagement between the national government of a recipient country and an external development partner regarding hydromet development projects often starts with the Ministry of Finance or the Ministry of Foreign Affairs. In many cases, investments in observations are promoted by other sectors/ministries and therefore do not involve the NMHS until fairly late stages, if at all. Both, per WMO regulations and in practice, the NMHS acts as the national node in the international exchange of observations. However, in several countries, implementing entities have failed to recognize the critical role of the NMHS until after all project resources have been expended, and hardware has been purchased and installed, but no data are flowing from it. No institutional, technical, or financial support and thus no incentives to the NMHS had been foreseen, and as a result, no observational data were exchanged.

3.2.5 Lack of a realistic financing model

In developing countries, SIDS and LDCs in particular, the lack of observations is also largely tied to the lack of local resources to pay for them. Figure 4 shows the horizontal density of observations currently exchanged internationally for NWP (left panel), and available financial resources, measured by GDP per km² surface area (right panel); a larger surface area implies a larger observing remit. Since SIDS are characterized by their Exclusive Economic Zones (EEZ) being many times larger than their land areas, calculations for SIDS were made including both EEZ and land areas. The differences in “ability to pay” between rich and poor countries are striking. The range of this measure spans six orders of magnitude (the richest countries’ GDP corresponds to one million times more dollars per km² than that of the poorest countries).

The combination of very low income with large geographic responsibilities in SIDS and LDCs makes it particularly challenging to achieve a reasonable density of sustained observations in many parts of the world. Scarce local resources lead to scarcity of observations, as evidenced by the similarity between the left and right panels in figure 4 if one compares the dark red areas in the left graph with the dark blue and purple areas in the right panel (mostly Africa and Pacific Islands).

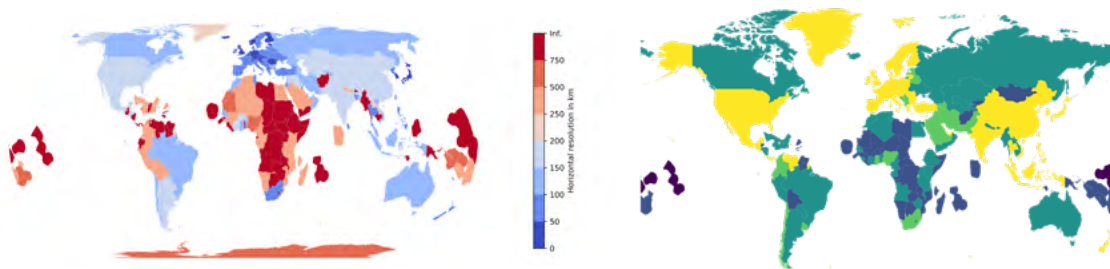


Figure 4. Ability to pay versus the ability to observe. Left panel: density of observations by nation (red do not meet GBON requirements). Right panel: National GDP/km² of surface area; darker colors (blue and purple) show fewer resources per unit area.

Source: WMO secretariat, 2021

The unequal geographic distribution of wealth shows how challenging it will be to achieve and sustain a minimum density of observations based on local resources alone in many parts of the world. However, the assumption enshrined in the WMO Convention is that each WMO Member bears the sole responsibility for providing the required data over its national territory. The Paris Agreement implicitly bases its language on Systematic Observation on the same assumption.

Assumptions of responsibility by international agreements, when combined with short-term, project-based approaches, leave the fundamental challenges of data sharing unresolved. Externally funded hydromet development projects typically include the sustainability of the project's investment as a de-facto presumption. Project documents aim to demonstrate that after the project ends the country can and will cover the long-term operations and maintenance costs of the infrastructure financed by the project. However, despite the best design, it has proved challenging to ensure sustainability in the context of short-term projects with long-term financing needs. This approach leads to a series of ad hoc projects, most of which eventually will not reach fruition in terms of sustainable data sharing. The main reasons for this are (i) the significant operation and maintenance costs of AWS, which often overload countries' budgetary capacities after the project ends, and (ii) the high installation, operating and maintenance costs of radiosonde stations which often lead to radiosondes not being addressed at all in project approaches. Radiosondes have some of the largest impacts on NWP skill, especially in the tropics, but the impact of these observations does not remain local, so single-country projects typically do not see a good value proposition in them. The lack of long-term support for maintenance and repair has also contributed to the lack of past successes. This was identified as a key factor in the World Bank's evaluation of its hydromet projects: "Maintenance continues to be a problem. Only four of the 12 closed African projects reported attention to maintenance."¹⁵ The Board of the Green Climate Fund (GCF) acknowledged that the GCF alone cannot ensure the sustainability of recently approved investments in basic observations.¹⁶

Finally, efforts to generate commercial revenue to cover the cost of certain government services, cannot be reconciled with the need for free and unrestricted international exchange of observations. Due to their role at the beginning of the value chain and prevailing international agreements regarding free data exchange, observations are difficult for national governments to monetize, and a wealth of economic analyses have shown that doing so would severely limit the use and impact of data.¹⁷ However, in their quest for revenue, some national governments have attempted to limit the freedom of their NMHSs to exchange data, including observations. Blocking the exchange of observations will have the unintended side effect of severely limiting the scope and quality of weather and climate services that the NMHS can provide for its national territory, thus preventing it from being able to deliver any services at all that can be monetized. WMO is currently updating its data policy (WMO Unified Policy on International Exchange of Earth System Data).¹⁸ A major element of the new policy will be to help improve access to and use of model output data for all Members. This will allow them to significantly improve and expand their service delivery capabilities.

4.

Call for action

There is a clear urgent need to globally act to close the large gaps in weather and climate observations effectively and sustainably. Numerous global agreements have recognized that successful action on climate mitigation, adaptation, resilience and poverty reduction depends on high-quality weather and climate services, and the capacity to make informed decisions and take appropriate steps in light of that information. Yet, many countries face significant and increasing challenges in the provision of those services. Recognizing these challenges, the international community has come together in many different contexts with agreements and calls for increased attention to improving weather forecasts, early warnings and climate services. Those agreements and calls also recognize that the quality of these forecasts and services depends on sound science, underpinned by robust earth observations, monitoring and analytics and that without reliable observations the foundation for the development and the climate agenda is weak.

4.1 The 2030 Agenda for Sustainable Development

The 2030 Agenda for Sustainable Development and the Sustainable Development Goals stress the importance of environmental monitoring and stewardship in support of ending poverty and hunger, providing affordable clean water and energy, and strengthening human and institutional capacity on climate change mitigation, adaptation, and early warning. In addition, there are specific targets that depend critically on observations and improved weather and climate prediction such as “strengthening resilience and adaptive capacity to climate-related hazards and natural disasters”; and “raising capacity for effective climate change-related planning and management in least developed countries and small island developing countries, including focusing on women, youth and local and marginalized communities.”

4.2 The Paris Agreement

The 2015 Paris Agreement specifically recognizes the importance of systematic observation. It 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”. The Agreement stresses the foundational role of observations in its call for enhanced action on adaptation. Observations are needed by all Parties to help plan adaptation strategies,

to observe how effective those strategies are, and to provide the information needed to proactively modify strategies as climate change unfolds. They form a critical input to the Global State of the Climate that informs the implementation of the Paris Agreement and the Global Stocktake.¹⁹ While the Paris Agreement applies equally to all Parties, it also highlights the need for developed countries to support less developed Parties financially and through capacity building.

In December 2019, the fifty-first session of the UNFCCC SBSTA recognized the importance of sustained systematic observation and the development of GBON and called for sustained funding to meet the essential needs for global climate observation under the Convention. In June 2021, at SBSTA informal consultations, some Parties further encouraged countries and relevant organizations to support SOFF in order sustain the implementation of GBON in developing countries.

4.3 The Sendai Framework for Disaster Risk Reduction

The 2015 Sendai Framework for Disaster Risk Reduction calls for promoting the collection, analysis, management and use of relevant data from maintained and strengthened in situ and remotely sensed Earth and climate observations. This framework is an international call to substantially reduce disaster risk and losses in lives, livelihoods, health and assets. One of its priorities is to improve understanding of disaster risk in all its dimensions of exposure, vulnerability and hazard characteristics and to improve weather and climate observations.

4.4 UNFCCC COP26 and increased climate finance ambition

The United Nations Secretary-General has called for a breakthrough on adaptation and finance ahead of the 26th Conference of the Parties (COP26), including funding for better observations. All projections show that the climate is expected to worsen over time: with existing national policies to cut greenhouse gas emissions the world is set on a trajectory for warming to reach 3.2°C above preindustrial levels by the end of the century.²⁰ Even with stronger mitigation measures, the resulting adaptation challenges will be huge, as the dramatic record-setting climate-related events over the summer of 2021 have shown, with deadly heatwaves, devastating floods and massive wildfires across all regions.

At COP26, Parties are expected to increase the level of ambition for mitigation and adaptation. Countries will be asked to come forward with ambitious 2030 emissions reductions targets that are consistent with reaching net zero by the middle of the century, but also to deliver on the promise to mobilize at least USD 100 billion in climate finance per year. All stakeholders are expected to play their parts through intensive collaboration between governments, businesses and civil society to enable vulnerable countries to rise to the challenges of climate change to adapt, including through strengthened early warning systems that help avoid loss of homes, lives and livelihoods.

The annual adaptation funding needs in developing countries are expected to increase to USD 140-300 billion by 2030, and USD 280-500 billion by 2050.²¹ This means that funding would need to increase ten-fold by the end of the decade to meet expected needs. The total climate finance share for SIDS and LDCs equates to only 14 and 2 percent of flows respectively, even though they are disproportionately affected by climate impacts.²² Support and funding for improved weather and climate observations are critical to identifying adaptation needs and crafting effective responses through the entire value chain.

4.5 A global call for improved weather and climate observations

Calls for improvements in the quality and sharing of data have now taken central stage in the global development and climate agenda. The World Bank's World Development Report 2021 noted the "tremendous potential [of data] to create value by improving programs and policies, driving economies, and empowering citizens" and called "for a new social contract for data – one that enables the use and reuse of data to create economic and social value, promotes equitable opportunities to benefit from data, and fosters citizens' trust that they will not be harmed by misuse of the data they provide." Special reference is made to the need for "gathering, sharing, and using better data on weather, water, and climate from low- and middle-income countries."²³ Similarly, the Global Commission on Adaptation has listed climate service data quality and data quality assurance, including weather data, as the first among six principles that need to be applied for assuring the success of digital climate-informed advisory services.²⁴

In July 2019, the 193 Member states and territories of WMO decided to commit to the implementation of the GBON, which aims to ensure adequate availability and international exchange of surface-based observations from all parts of the world. GBON can be implemented relatively quickly by most WMO Members in the developed world. But in many developing countries substantial financial and technical support and capacity development is needed.

In December 2019, at COP25, the Alliance for Hydromet Development was launched by major development and climate finance organizations to support developing countries in addressing their hydromet gaps. In its founding declaration, the Alliance recognized the urgency of addressing the issue of missing observational data in a coordinated manner. All Alliance members called for the creation of a Systematic Observations Financing Facility²⁵ as an innovative way to finance developing country surface-based observations, particularly for SIDS and LDCs. The First Hydromet Gap Report ratified SOFF as a commitment and priority of the Alliance.²⁶

As the design of SOFF has taken shape, important members of the international community have called for its financing and establishment. Beneficiary countries, represented by the Least Developed Countries Group, the Alliance of Small Island Developing States, the African Group of Negotiators as well as heads of state from across the globe, have urged donors to mobilize the resources necessary to establish SOFF.²⁷ Key international partners have supported this call, including, among others, the UN Secretary-General, the Managing Director of the IMF, all leaders of the members of the Alliance for Hydromet Development, the Executive Secretary of the UNFCCC, the major European meteorological institutions, and the renowned economist Lord Nicholas Stern. The Crisis Lookout Initiative has supported the creation of SOFF with a request to the G7.²⁸ This initiative, spearheaded by the UK-based Centre for Disaster Protection, has presented a solutions paper to the G7, recommending G7 countries to support SOFF.

In sum, countries, their partners, global leaders and stakeholders recognize that the collection and sharing of more and better weather and climate observations and hence the creation and funding of SOFF is critically necessary to support the call for action under key global agreements. The global community urgently needs improved weather and climate observations for better-informed development, climate action and disaster risk reduction. Without better observations, the world will be severely handicapped in facing an uncertain future.

5.

Rationale for SOFF

Achieving sustained compliance with the GBON regulations and hence a sustained improvement in observational data will require substantial investments, strengthened capacity and long-term resources for operation and maintenance in many countries.

SOFF will channel international support to strengthen countries' basic observation capacity through the combination of four key features: (i) deploying a global approach with sustained international data exchange as a measure of success; (ii) providing innovative finance; (iii) enhancing technical competence and integrated approaches; and (iv) leveraging knowledge and resources. The defining elements of SOFF are summarized in box 4.

Box 4. What is SOFF?

- **A global initiative to address a persistent problem in a global and systematic manner** – i.e., missing surface-based weather and climate observations from developing countries.
- **An initiative with an exclusive focus on the initial part of the meteorological value chain** that creates the foundation for effective weather and climate information services.
- **A dedicated financing mechanism** that provides grants and technical assistance, with a focus on SIDS and LDCs, to enable sustained compliance with the GBON regulations.
- **A mechanism that is built on peer-to-peer collaboration and support** among national meteorological services, harnessing their operational experience as providers of peer technical advice.
- **A commitment of the Alliance for Hydromet Development**, supported by beneficiary countries and multiple stakeholders.

5.1 Deploying a globally coordinated approach with sustained data exchange as a measure of success

SOFF actions will be guided by an optimal and internationally agreed global design and corresponding metrics – the GBON. GBON clearly defines countries' international data exchange obligations for the most essential surface-based weather and climate data.

GBON metrics will guide SOFF investments. SOFF will provide the resources for beneficiary countries to close the GBON gap. In other words, GBON metrics will ensure the "right" level of investments, and SOFF will deliver these investments through an integrated and coherent intervention.

GBON compliance will constitute the measure of success. The GBON metrics and WMO's data quality monitoring system (WDQMS, box 5) allow for an objective assessment of countries' compliance with their obligation for the international exchange of basic surface-based observations. In other words, the success of countries and SOFF – will be measured by the amount and quality of internationally exchanged data (see section 8.4.3).

Box 5. WMO Integrated Global Observing System Data Quality Monitoring System (WDQMS)

The WDQMS webtool is a resource developed and operated by WMO together with ECMWF to monitor the routine delivery of data into WMO's international data exchange system. The current operational version of the webtool monitors the availability and quality of observational data based on near real-time monitoring information from the four participating global NWP centres: the German Weather Service (DWD), the ECMWF, the Japan Meteorological Agency (JMA) and the United States National Centres for Environmental Prediction (NCEP). Information provided by this system was used as input for the assessment of the global GBON gap. Due to the recent decline in the amount of observational data caused by the COVID-19, the average availability of data over January 2020 was used as a measure of whether a given station was reporting data internationally. The WDQMS will be the monitoring system used by WMO as the SOFF technical authority to monitor GBON compliance for the results-based finance support provided to beneficiary countries. The tool can be accessed at <https://wdqms.wmo.int>.

5.2 Providing innovative finance

SOFF finance will (i) be grants-only; (ii) be predictable and long-term; (iii) contribute to operations and maintenance costs; and (iv) use a results-based approach for payments.

Grant finance. SOFF will provide additional and grant-only resources to compensate for the fact that investments made in a particular country also create benefits in other countries and contribute to a global public good. This inevitably disadvantages investments in observations where the benefits reach beyond individual countries and countries benefit from observations made by other countries. Therefore, SOFF provides additional international resources beyond existing country envelopes set by development and climate finance partners. Grant-only support for SIDS and LDCs is justified by (i) the global public goods dimension of recipient countries' contribution to GBON; (ii) their limited institutional and fiscal capacity, in particular as measured by GDP per square kilometer reflecting the surface area to be observed (figure 4); (iii) debt sustainability challenges and the rapidly unfolding post-COVID debt crisis; (iv) the high vulnerability of SIDS and LDCs to extreme weather events and impacts of climate change; and (v) the global call on all developed countries and climate finance providers to increase the level of grant finance to support the most vulnerable, in particular for adaptation (call led by the COP26 UK – Presidency).²⁹

Predictable long-term finance. SOFF will provide long-term financial and technical support, beyond time-bound projects. The long-term nature of support and the predictability of resources will allow countries to make corresponding policy and investment decisions. For example, countries could consider establishing public-private partnerships in support of the generation and exchange of observations that require long-term engagements to be successful (see section 8.5 and annex 5 on the role of private sector)

Finance for operations and maintenance. Achieving sustained GBON compliance in SIDS and LDCs requires not only capital expenditures and short-term efforts to improve institutional capacity, e.g., resources to purchase or improve fixed assets like observations equipment and staff training, it also requires the provision of finance for operations and maintenance. SOFF will substantially contribute to cover operations and maintenance costs – in the long term and through results-based finance.

Results-based finance. SOFF will ensure that countries have the means for the sustained generation and international exchange of observational data following GBON regulations through the provision of results-based finance, i.e., payments made upon achievement of results (international exchange of observational data) (see section 8.4.3).

5.3 Enhancing technical competency and coordination

Operating and maintaining observing networks and internationally exchanging the data is a complex undertaking, in particular for countries with limited human and institutional capacity and challenging national circumstances. SOFF will enhance beneficiary countries' capacity by harnessing the operational experience of advanced NMHSs. These NMHSs will provide hands-on peer-to-peer technical and institutional assistance, including South-South peer support (see section 7.7).

The provision of advisory support based on the advanced NMHS will ensure the sustainability, coherence, credibility and trust of technical assistance provided through SOFF. Advanced NMHS are WMO Members and as such have a long-term history of engagement, expertise and knowledge of WMO standards and guidelines. The provision of technical assistance through peers that are Members of WMO will facilitate standardization, coherence and coordination of SOFF technical advice across countries, regions and globally. SOFF advisory services will be institutionally anchored and backed at the highest level by the NMHS providing technical assistance. Contrary to the provision of fragmented advice through diverse consultants, peer-to-peer support will also allow continuous feedback and sustainable capacity development of both the providers of technical assistance and the benefited countries.

SOFF will provide integrated and coordinated support to strengthen countries' basic observations capacity at the global and country level. SOFF will provide the mechanism for effective collaboration and coordination among the several scientific, financial, and operational partners involved in strengthening the weather and climate observing system in developing countries (see section 7). SOFF will bring together major partners with a clear focus on the primary links of the hydromet value chain that can only be implemented under a globally coordinated approach to succeed. SOFF will close the GBON investment gap through standardized integrated interventions with coherent procurement of equipment for each beneficiary country or sub-region. This will address the problem of multiple development and climate finance partners supporting different parts of a country's basic observing network in a fragmented manner, relying on different vendors with interoperability challenges and requiring different spare parts.

5.4 Leveraging knowledge and resources

SOFF creates leverage through its outcomes. Sustained GBON compliance is a foundational element of the value chain (figure 5). The effectiveness of investments in the latter part of the chain – where the substantial part of today’s international hydromet development investment is placed – fully depends on the first parts of the chain.

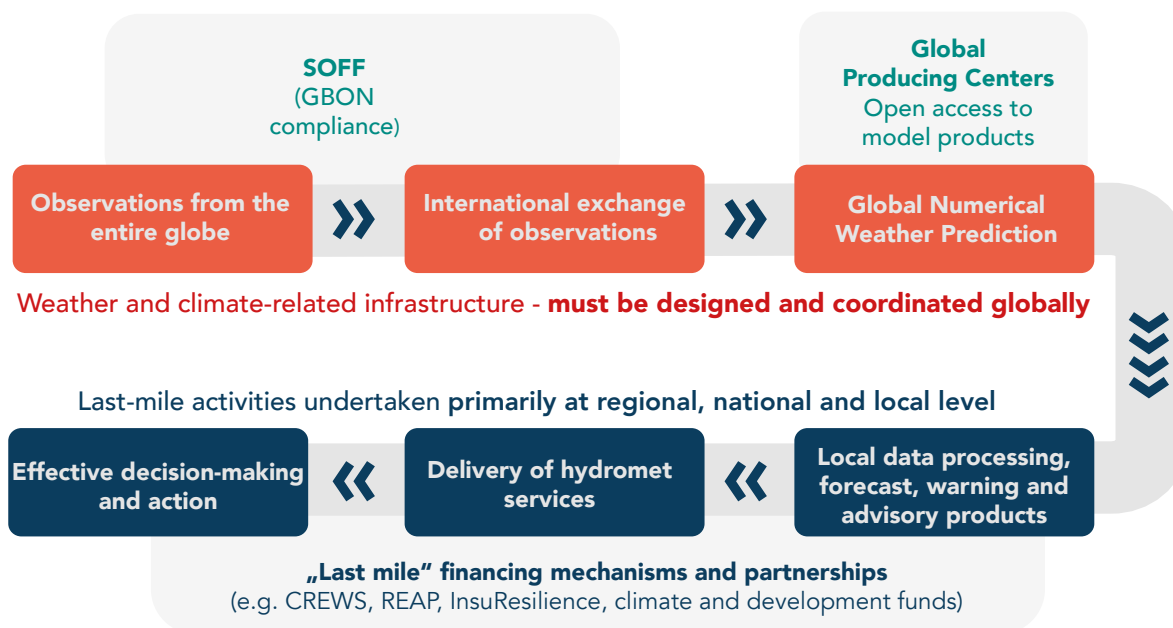


Figure 5. SOFF contribution to the latter links of the meteorological value chain.

Source: WMO, Secretariat 2021

SOFF creates leverage through the Country Hydromet Diagnostics (CHD). The CHD (see box 10 in section 8 and annex 4) are not only an important element of SOFF support, but also contribute to informing priorities for investments of other development and climate finance partners. By authoritatively screening the whole value chain and identifying gaps through a peer-to-peer approach, they provide an analytical foundation for prioritizing hydromet investments. SOFF funding partners, Alliance members, the Climate Risk and Early Warning Systems Initiative (CREWS) and other initiatives will be able to use this information for their investments in the countries where they have programmes.

SOFF creates leverage through its Implementing Entities. Generally, SOFF resources – funding and technical advice – will be embedded into larger country hydromet investment operations supported by the Implementing Entities, either within a country or at a sub-regional level to create economies of scale and blend SOFF resources with resources provided by the Implementing Entities. Implementing Entities can draw on the advisory services provided by advanced NMHSs for the SOFF part of the projects and programmes and the best integration of SOFF into larger operations.

SOFF creates leverage through its governance structure. The SOFF funding partners not only invest in SOFF but channel substantial resources through bilateral and/or multilateral mechanisms in resilient development and climate adaptation. As SOFF decision-makers, the funding partners can ensure that SOFF creates the foundation for these other investments and that this foundation is properly used in the investments made by these partners. Investments funded by CREWS are critical to be able to realize the benefits from SOFF investments. Therefore, it is envisioned that CREWS be represented in the SOFF governance structure (box 6 and section 7.3). In addition, it is envisioned that the SOFF Advisory Board include representatives from initiatives like the Risk-Informed Early Action Partnership (REAP) and InsuResilience; this will help ensure SOFF “last mile” links and leverage (section 7.4). REAP is of particular importance as an overarching framework for ensuring last-mile impact, and SOFF will make a significant contribution to achieving its goals (box 7).

Box 6. The SOFF/CREWS symbiotic partnership

SOFF and CREWS are playing complementary roles and are mutually dependent for their success. Both mechanisms prioritize SIDS and LDCs. The effectiveness of CREWS is dependent on SOFF outcomes, i.e., improved weather and climate prediction products as a result of sustained compliance with GBON in SIDS and LDCs. At the same time, achieving the SOFF goal of strengthened resilient development and climate adaptation requires initiatives like CREWS. In the absence of SOFF, CREWS has also been investing in basic observations, but given its institutional set-up is not equipped to fully address the challenges stated in section 3 in a sustained manner.

With the creation of SOFF, CREWS can deploy its resources focusing on the downstream part of the value chain while contributing to shaping SOFF through the envisioned role for CREWS in the SOFF governance structure.

Box 7. REAP aims to make 1 billion people safer from disasters by 2025

REAP brings together an unprecedented range of stakeholders across the climate, humanitarian and development communities committed to driving a systemic shift towards acting earlier – in advance of a hazard striking - to reduce the impacts of disasters.³⁰

To underpin this shift towards earlier action, the basic observational data exchange, supported by SOFF, will lead to improved, earlier, more reliable weather and climate forecast prediction everywhere, the basis on which anticipatory action plans and triggers are built. Improved data will reduce forecast inaccuracies and support the uptake of risk-informed early action approaches.

For this reason, SOFF is recognized as a core initiative to support the achievement of REAP Target 3: \$500 million invested in early warning system infrastructure and institutions to target early action in 'last/first-mile' communities, building on existing initiatives.³¹



6. SOFF theory of change

SOFF activities will be guided by the theory of change in figure 6 and the Results Framework presented in annex 1.

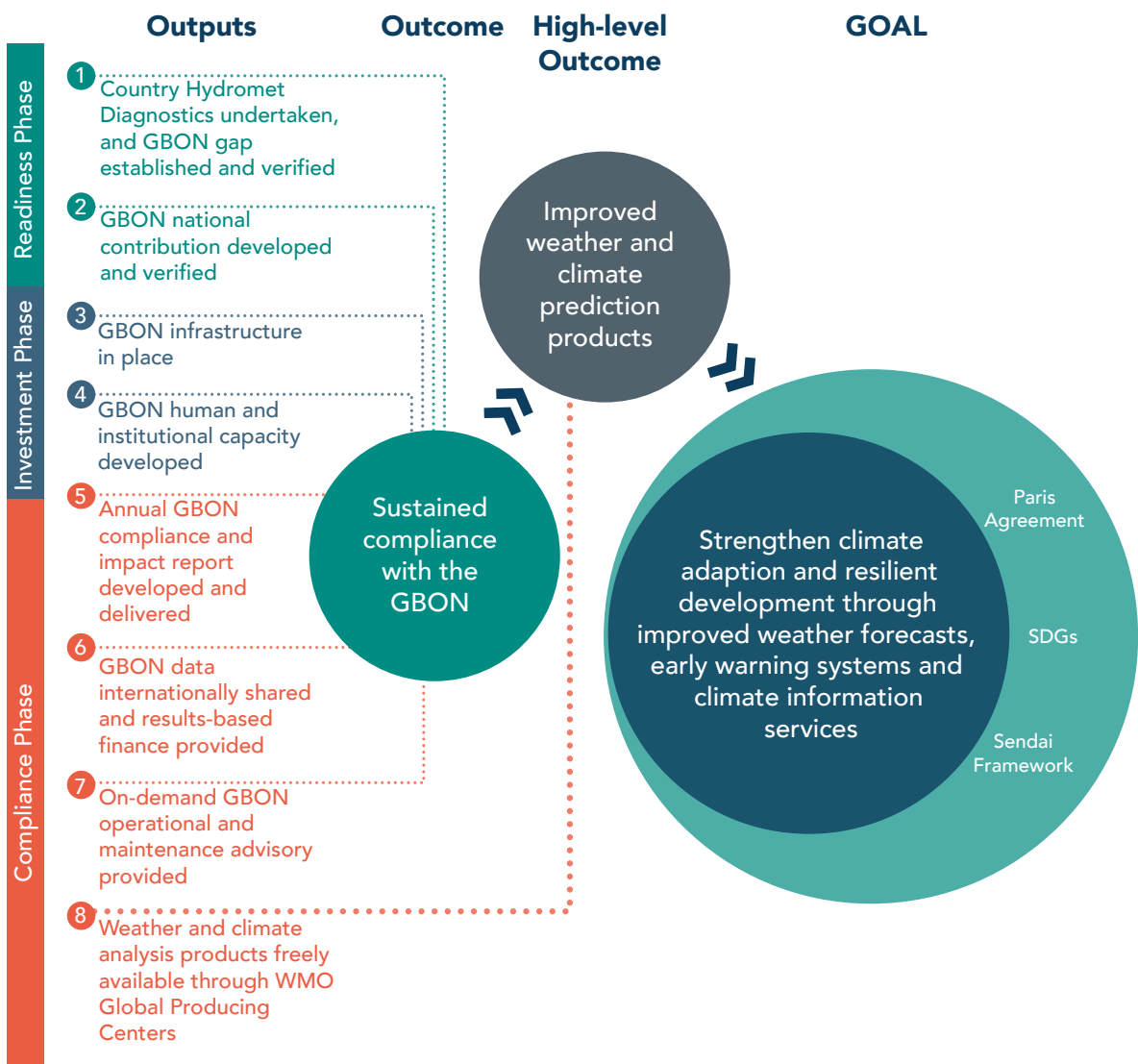


Figure 6. SOFF theory of change

6.1 SOFF goal

The overarching SOFF goal is to contribute to strengthening climate adaptation and resilient development through improved weather forecasts, early warning systems and climate information services that save lives and livelihoods and protect property. SOFF will contribute to delivering critical observations needed for adaptation and resilience planning. Weather and climate prediction products provided by the global NWP centres are essential to ensure that countries have the ability to plan and adapt to climate change as well as to design and implement meaningful and effective adaptation and resilience development programmes.

SOFF will also contribute to improving the global understanding of past and current climate and the ability to predict and project future climate scenarios. Observations provided through SOFF are essential for the implementation and monitoring of the Paris Agreement. They will contribute to monitoring and assessment (through the Global Stocktake and the annual State of Global Climate), including global temperature trends, and the overall impact of Nationally Determined Contributions (NDC) on the climate system and needed action to increase ambition.

6.2 High-level outcome: Improved weather and climate prediction products

The increased international exchange of observations that will be achieved through SOFF support in SIDS and LDCs will contribute to the substantial improvement of the forecasting and reanalysis products delivered by Global Producing Centres. As seen in section 2, the foundation of all-weather and climate monitoring and prediction is global NWP done by the Global Producing Centres operated by WMO Member states and territories.

SOFF support, and in particular the Compliance phase, will ensure that the observations generated by countries are effectively shared with the Global Producing Centres. The Centres will be able to provide free access to WMO Members (193 countries and territories, including SIDS and LDCs) to improved forecasting and climate prediction products. The programs and projects in which SOFF funding will be embedded will further support countries in developing the capacity to effectively use the improved weather and climate prediction products. This will ensure that SOFF outcome translates into last-mile impact.

6.3 SOFF outcome: Sustained compliance with GBON

SOFF establishes a highly ambitious long-term target of achieving sustained GBON compliance in all SIDS and LDCs. Based on a GBON gap assessment performed in January 2020 by the WMO Secretariat, it is estimated that to close the GBON gap and meet the GBON regulations in SIDS and LDCs, more than 2000 new or rehabilitated stations (surface and upper air stations) need to become operational and exchange data. This will allow SIDS and LDCs to achieve GBON compliance through more than 2300 stations exchanging observations. Once these stations are operating and sharing the data, observations shared to the Global Producing Centres are estimated to increase by 28 times for surface stations and 12 times for upper air stations compared to the January 2020 baseline. As shown in figure 7, SIDS and LDCs require by far the largest increase in shared observation to achieve GBON compliance.

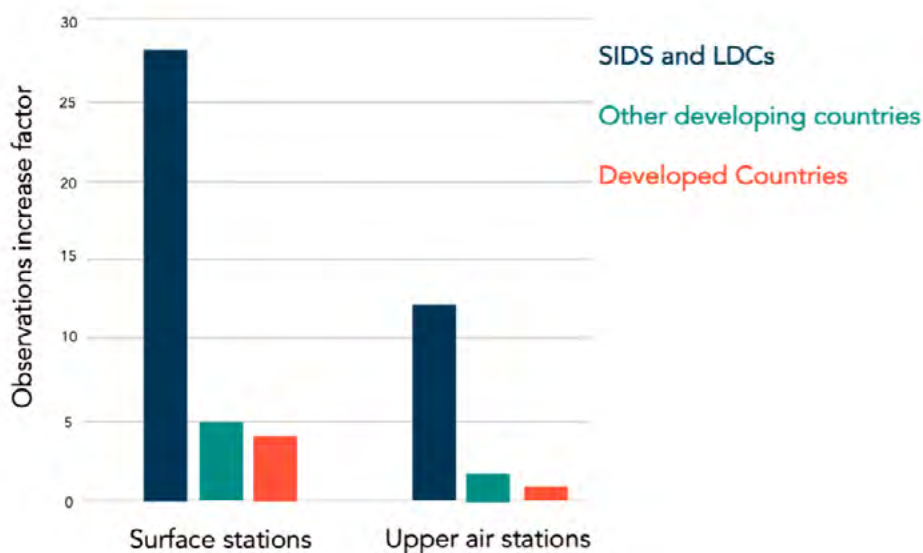


Figure 7. The expected relative increase in observations (surface and upper air) if all countries comply with the GBON regulations.

Source: WMO Secretariat, 2020

6.4 SOFF outputs

SOFF will achieve its outcome through eight outputs delivered across the Readiness, Investment and Compliance phases. Section 8 describes how SOFF resources will be deployed to deliver these outputs.

6.4.1 Readiness Phase

Output 1. Country Hydromet Diagnostics (CHD) undertaken and GBON established and verified

The first step for any country accessing SOFF resources involves assessing the GBON country gap and conducting the CHD. The GBON country gap will be verified by WMO as the SOFF Technical Authority.

Output 2. GBON national contribution plan developed and verified

The information provided by GBON gap assessment complemented by the CHD broader screening of gaps and NMHS capacity will become the basis for the development of the GBON National Contribution Plan. This plan will identify and articulate, in the form of a funding proposal, the investments and human and institutional capacity needed to operate, maintain and sustain a national observing network compliant with the GBON regulations.

6.4.2 Investment Phase

Output 3. GBON infrastructure in place

Observation infrastructure, telecommunications, and other needed equipment for GBON compliance will be acquired and installed.

Output 4. GBON human and institutional capacity developed

Human and institutional capacity to operate and maintain the observing network will be developed.

6.4.3 Compliance Phase

Output 5. Annual GBON compliance and impact report developed and delivered

The SOFF Secretariat will work with WMO technical authority and WMO Global Producing Centres in developing and delivering a report composed of two sub-sections:

- **Report on countries' GBON compliance and SOFF implementation progress.** The annual report will provide the status of both the individual countries' compliance and the overall SOFF implementation progress against the targets established.
- **Report on the impact of improved observations in forecast performance in SOFF supported countries and globally.** The report will assess the contribution of increased observations sharing to the improvement of weather forecast performance. The report will also provide feedback on the quality of observations.

Output 6. GBON data internationally shared and results-based finance provided

Results-based finance will be provided as a contribution to the operations and maintenance costs needed to sustain GBON data sharing compliance. Support to sustain GBON compliance will be provided on a long-term basis. During SOFF replenishment cycles countries' status and eligibility criteria will be reviewed and adjusted, as needed, by decision of the Steering Committee.

Output 7. On-demand advisory support provided

Advisory support on GBON operations and maintenance will be provided through peer advisors.

Output 8. Weather and climate analysis products are freely available

These products are generated by the WMO Global Producing Centres and are exchanged internationally via the Global Data Processing and Forecasting System. According the WMO Unified Data Policy (Extraordinary Session of the World Meteorological Congress, October 2021), these products will be exchanged on a free and unrestricted basis with all WMO Members.



7. SOFF governance

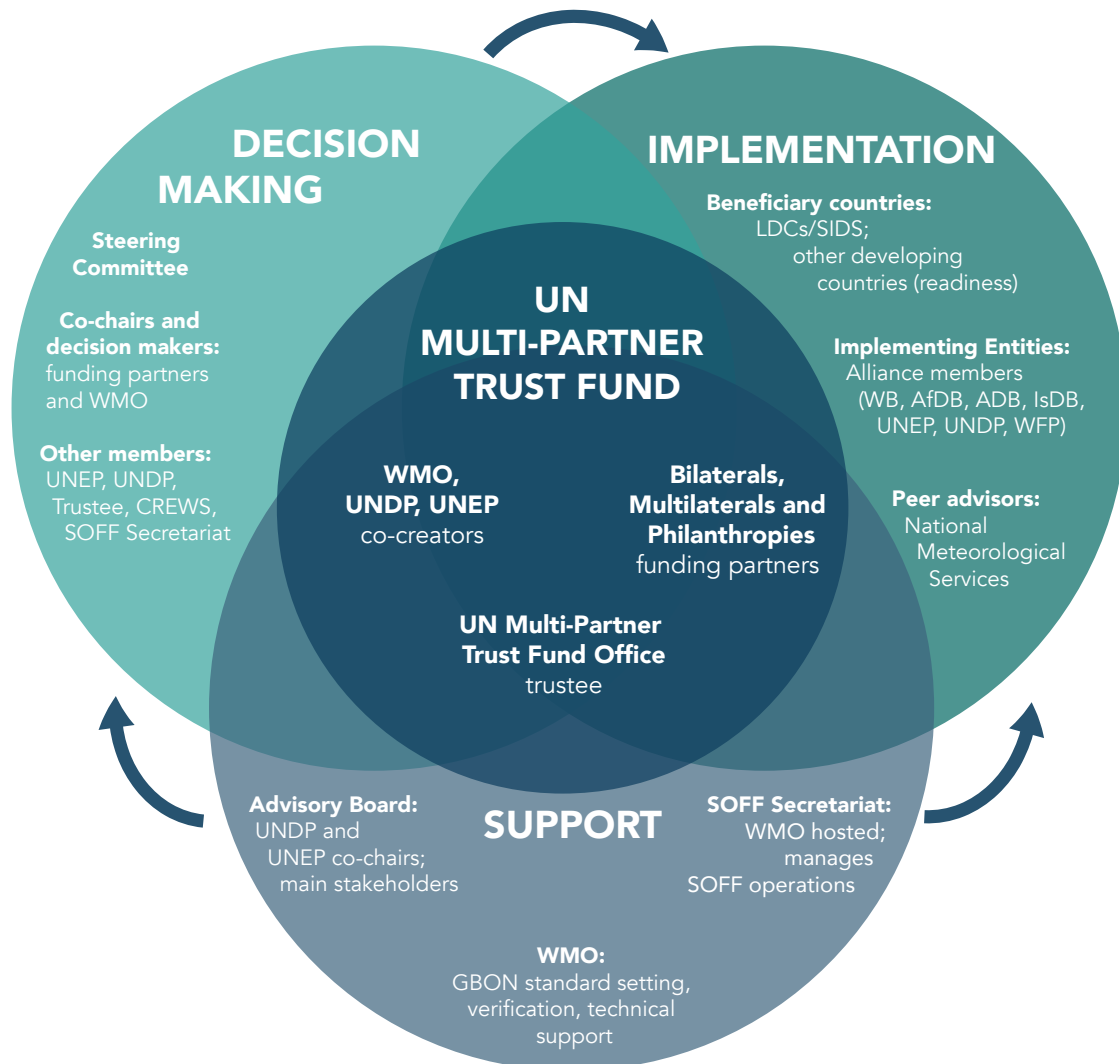


Figure 8. SOFF Governance

Achieving sustained GBON compliance requires the effective and transparent collaboration of many stakeholders in new ways; therefore, the SOFF institutional structure and governance will be both inclusive and focused. SOFF governance will take advantage of the competencies and unique value proposition of the involved institutions. Based on an in-depth analysis of the SOFF potential institutional options,³² SOFF will be created as a “UN coalition fund” and established as a UN Multi-Partner Trust Fund (UN MPTF).

The governance structure will consist of the following bodies: a Steering Committee that will guide the fund as its decision-making body; a multi-partner Advisory Board that will advise the Steering Committee; the UN MPTF Office as Trustee; a SOFF Secretariat that will manage SOFF operations including the provision of peer advisory services; a technical authority that will guide and act as an independent verifier of the technical specifications of SOFF operations (WMO); and Implementing Entities that will implement SOFF investments (consisting of the Multilateral Development Banks and UN organizations that are members of the Alliance for Hydromet Development). These different bodies and their roles are discussed below.

7.1 A UN Multi-Partner Trust Fund (UN MPTF)

SOFF will be set up as a “UN coalition fund”. WMO, UNDP and UNEP will create the fund jointly. SOFF will be created as a joint UN initiative to maximize its impact and visibility.

SOFF will be established as a UN MPTF that pools contributions from SOFF funding partners, with the UN MPTF Office serving as a SOFF Trustee.³³ The UN MPTF Office was established in 2003 and is administratively housed within UNDP. It is the UN mechanism for the administration of pooled financing instruments currently totaling more than USD 15 billion. The UN MPTF Office has a track record in 139 countries. It has experience in receiving and pooling financial resources from many public bilateral and multilateral as well as private sources.³⁴ Of relevance for SOFF is the UN MPTF Office experience with the direct transfer of resources to countries through results-based financing.

The UN MPTF Office as the Trustee for the Facility will provide fiduciary oversight and other support services in accordance with legal frameworks established between the United Nations, the co-founders (WMO, UNDP, UNEP) and the SOFF funding partners. The UN MPTF Office uses a pass-through modality where each SOFF Implementing Entity (selected UN organizations and MDBs - see section 7.6) applies its own procedures, provided they meet the UN MPTF requirements with regards to safeguards and fiduciary policies. The UN MPTF Office relies on the UN financial audit systems of the UN organizations and of each participating MDB. The costs for the UN MPTF Office Trustee function correspond to an administrative fee of one percent of the contribution by funding partners.

The UN MPTF framework offers the required flexibility, simplicity and speed for the creation of SOFF. It will benefit from existing, pre-cleared Standard Legal Agreements between the Trustee (UN MPTF Office), all UN agencies and programmes (including UNEP, UNDP), the World Bank, OECD Development Assistance Committee (OECD DAC) donors, non-DAC middle income and developing country donors, and philanthropies. The SOFF MPTF will be legally established by late October 2021 to accommodate contributions that will be made this calendar year (see section 9.6).

7.2 Roles of the “UN coalition” partners

As SOFF cofounders, WMO, UNDP and UNEP will be part of the Steering Committee. According to UN MPTF policies, the founding UN organization co-chairs the Steering Committee jointly with a representative of the funding partners; if a fund is established as a “UN coalition fund” any of the UN coalition partners can play this role on behalf of the others. In agreement with UNDP and UNEP, WMO will serve as the Steering Committee co-chair in a decision-making role. A senior-level coordination mechanism among the three coalition members will be established.

WMO will serve as the SOFF technical authority, independent verifier of GBON compliance, and host of the SOFF Secretariat. The WMO Secretariat, guided by the WMO Commission for Observation, Infrastructure and Information Systems, will be responsible for confirming the technical aspects of the GBON national contribution (i.e., detailed funding proposal to close the GBON gap) and verifying GBON compliance. WMO verification will trigger SOFF investment and compliance support. WMO will also substantially contribute to the annual GBON compliance and SOFF impact report in two ways: first, it will report on global GBON compliance; second, in collaboration with Global Producing Centres, it will assess the impact of SOFF investments on forecast accuracy. Finally, WMO will administratively host the SOFF Secretariat and provide technical support for the provision of peer advisory services (see section 7.7). WMO will not be an Implementing Entity.

UNDP and UNEP will bring their respective strengths and expertise into SOFF. Both organizations will support beneficiary countries as SOFF Implementing Entities, co-chair the SOFF Advisory Board and be represent it in the Steering Committee. They will also contribute to the SOFF Secretariat through staff secondment.

7.3 SOFF Steering Committee

The Steering Committee will oversee the activities of the Facility and decide on its strategic direction. It will approve and amend SOFF governance documents and operational guidelines, ensure that the operations of the Facility are consistent with its mandate and objective, and ensure complementarity between SOFF and “last mile” initiatives. It will approve overall funding allocations and individual funding requests and receive regular audit reports. The Steering Committee will meet as often as needed, at least two times a year virtually or physically. The decisions by the Steering Committee will be made by consensus among decision-making members and taking into

consideration the views of the non-decision-making members and recommendations of the Advisory Board. SOFF will follow an adaptive learning process. Based on inputs from the SOFF Secretariat and the SOFF Advisory Board (see below) the Steering Committee will continuously monitor, assess and, as needed, adjust SOFF operational modalities.

The Steering Committee will be composed of decision-making and non-decision-making members. Decision-making members will be all funding partners and WMO. Non-decision-making members will include UNDP and UNEP as the co-chairs of the Advisory Board, a representative from the Trustee providing financial information and advice (UN MPTF Office), and the head of the SOFF Secretariat. In order to closely link the CREWS and SOFF initiatives, it is proposed that a representative from the CREWS initiative will be part of the SOFF Steering Committee in a non-decision-making role (box 5).

7.4 SOFF Advisory Board

A multi-stakeholder SOFF Advisory Board will be established. Its objectives will be to ensure that SOFF responds to beneficiary countries' needs; that it creates synergies with major adaptation and resilience initiatives, linking SOFF with "last mile" policy and investment decisions; and that the SOFF strategic direction evolves as GBON evolves. The Advisory Board will meet virtually ahead of each Steering Committee meeting to prepare recommendations for the Steering Committee. As SOFF co-founding partners, UNDP and UNEP will co-chair the Advisory Board. The co-chairs will be expected to leverage the knowledge, advocacy and political influence of their institutions.

The Advisory Board will bring together the most important SOFF stakeholders. It will be composed of the co-chairs and up to 15 members. It is proposed that the Board includes representatives from beneficiary countries (the LDC Group and AOSIS), the Alliance for Hydromet Development (on a rotating basis a representative from one of the environment and climate funds among the Alliance members, i.e. Adaptation Fund, GCF, Global Environmental Facility (GEF), Climate Investment Funds (CIFs)), United Nations Office for Disaster Risk Reduction (UNDRR), Global Center on Adaptation (GCA), REAP, InsuResilience, the Global Facility for Disaster Risk Reduction (GFDRR), Climate for Development in Africa Initiative (ClimDev), the Centre for Disaster Protection, Group on Earth Observations (GEO), a representative from the Global Producing Centres (on a rotating basis), a civil society umbrella organization representative, and a private sector representative (Association of Hydro-Meteorological Equipment Industry – HMEI).

7.5 SOFF Secretariat

SOFF requires a specialized Secretariat to manage SOFF operations and to coordinate and ensure coherence of action by the many SOFF partners. The SOFF Secretariat will operate under the overall guidance of the Steering Committee and be accountable to it. The Secretariat will deliver on a variety of tasks.

Tasks related to SOFF programming and operations include the provision of the secretariat function to the SOFF Steering Committee and the SOFF Advisory Board; preparation of SOFF rules, procedures, operational manual and guidelines for Steering Committee decision; preparation of the SOFF investment plan, review of funding requests and portfolio overview; and administration of the provision of peer advisory services to beneficiary countries and their SOFF Implementing Entities (see section 7.6 below).

Tasks related to SOFF monitoring, reporting and learning include reporting to Steering Committee, Advisory Board and trustee on SOFF progress; development of a monitoring and evaluation framework; and capturing of lessons learned, good practices and innovative solutions, including concerning private sector engagement on SOFF implementation.

Tasks related to partnerships and resource mobilization include management of SOFF relationships with all beneficiary countries and stakeholders; SOFF outreach and communications; and support to SOFF fundraising.

The SOFF Secretariat will be hosted by WMO and respond to WMO administrative policies and procedures. UNDP and UNEP will contribute to the Secretariat staffing through secondments. The UN MPTF Office stands ready to provide additional technical expertise for the set up and initial functioning of the SOFF Secretariat, as needed. The SOFF Secretariat will be technically supported by the WMO Secretariat that will provide technical backing including support to the national meteorological services that operate as SOFF peer advisers (technical guidance, endorsement of peer advisers, regular refinement of the Country Hydromet Diagnostics tool). The budget of the SOFF Secretariat (staff costs including secondments, operational costs) will be approved by the Steering Committee on an annual basis as a direct cost to the Facility.

7.6 SOFF Implementing Entities

Major multilateral development partners that play an important role in hydromet project implementation will serve as SOFF Implementing Entities for the investment phase – MDBs (the World Bank and the regional development banks) and UN organizations (UNDP, UNEP, World Food Programme). All Implementing Entities are members of the Alliance for Hydromet Development.³⁵

Implementing Entities are encouraged to partner with other national or international organizations, including bilateral cooperation agencies and national or regional institutions accredited to climate funds (e.g. GCF direct access entities), for SOFF implementation. Implementing Entities will receive a maximum implementation fee of 7% to cover their institutional costs.

7.7 SOFF peer advisors

Peer advisory support is a foundational element for SOFF implementation. In 2019, the World Meteorological Congress decided to establish the Country Support Initiative (CSI) as WMO's peer-to-peer advisory service mechanism.³⁶ As the CSI has not yet been created and, to avoid institutional fragmentation and to reduce costs, the peer advisory services originally proposed for the CSI will be adjusted and integrated into SOFF. Given the SOFF urgency and opportunity, the scope of CSI advisory services provided by WMO Members on a peer-to-peer basis will be tailored to SOFF needs, focusing on

- conducting Country Hydromet Diagnostics;
- establishing the national GBON gap;
- supporting the development of the GBON national contribution;
- advising on the integration of SOFF into broader hydromet/climate projects of the respective Implementing Entities; and
- providing on-demand continuous advisory support during the SOFF investment and compliance phases.

Having a strong pool of peer advisors and high-quality provision of peer advisory services is key to the success the SOFF. SOFF peer advisors will be NMHSs that have substantial expertise in the areas of advisory services for SOFF, a track record in partnering and supporting other NMHSs, and a commitment to make available adequate human resources. The WMO Secretariat will endorse the NMHSs interested in serving as peer advisors and will establish the pool of peer advisors. This will be done in coordination with the SOFF Secretariat and in dialogue with the interested meteorological offices and according to transparent criteria. A pool of about 25 to 30 peer advisors is envisaged, reflecting initial interest expressed during the development of the CSI. Emphasis will be given to promote South-South peer advisory arrangements. The selection of peer advisors from the pool for specific assignments will consider experience in partnering with the respective beneficiary country and, most importantly, beneficiary countries' preferences.

Relevance, effectiveness and efficiency of the peer advisory services will be assessed as part of the SOFF initial external evaluation to be completed in the third year of SOFF operations. Based on the initial experience and the envisioned evolution of GBON and SOFF, options to deliver additional advisory services as envisaged in the CSI original concept will be explored.³⁷ Annex 4 describes in more detail the CSI advisory services as tailored to SOFF needs.

Box 8. Role of bilateral and multilateral partners

Bilateral and multilateral partners are invited and encouraged to financially contribute to the SOFF UN MPTF as the dedicated single-purpose global facility to support GBON compliance. In those cases where bilateral or multilateral partners consider directly investing in improvements in observation capacity outside the SOFF UN MPTF, the following principles are proposed to maximize effectiveness:

- **Focus on activities not covered by SOFF:** partners are encouraged to focus on activities that complement but do not duplicate those which SOFF will support, i.e., GBON investments in non-LDC/SIDS developing countries, observation investments beyond GBON regulations, or investments in other aspects of the meteorological value chain, including last-mile activities, in all developing countries.
- **Entire country approach:** If, however, bilateral or multilateral partners plan to directly support GBON investments in SIDS and LDCs, they are encouraged to take an entire country approach. To avoid overlap, inefficiencies and challenges for interoperability of procured technologies, partners investing in the respective countries are encouraged to aim at closing the entire GBON gap and to become the partner responsible for supporting the country in achieving full GBON compliance.
- **Contribution to SOFF:** If partners decide to directly invest in GBON observations outside the SOFF UNMPTF, they are encouraged to follow the GBON investment framework and have the surface observation system achieve GBON compliance (i.e., sustained international exchange of GBON data with GBON standards as independently verified by WMO). The GBON investment framework includes two elements:
 - GBON technical specifications and requirements as defined by the World Meteorological Congress;
 - GBON gap independently verified and technical aspects of GBON national plan reviewed by WMO.
- **SOFF support:** For projects with the objective to close the national GBON gap outside the SOFF UN MPTF, SOFF would make available the following support, financed by SOFF UN MPTF resources:
 - Readiness support: SOFF readiness peer advisory services; and
 - Compliance phase support: Long-term financial compliance support for all reporting GBON stations financed by bilateral or multilateral partners in SIDS and LDCs and access to continuous technical support following SOFF operational and administrative procedures.
- **No SOFF investment phase support:** When a bilateral or multilateral partner directly covers GBON investments in an LDC or SIDS country, SOFF will not provide funding for that purpose. The SOFF Secretariat would inform Steering Committee, Advisory Board and SOFF Implementing Entities that the respective partner will cover the GBON investments in these countries.



8.

SOFF

operational framework

This section describes the proposed operational design and arrangements for SOFF. The final detailed arrangements will be prepared during the SOFF start-up period by the SOFF Secretariat in an operational manual to be approved by the first SOFF Steering Committee.

8.1 Eligible countries

In its initial three-year implementation period, SOFF will prioritize support to SIDS and LDCs for all three phases. All other OECD ODA-eligible developing countries will be eligible for SOFF support under the Readiness phase only. In many non-SIDS and LDCs developing countries, targeted technical assistance has the potential for rapid gains in achieving GBON compliance, supported where necessary by investment funding from multilateral or bilateral partners. The lessons learned from engaging with these countries will help SIDS and LDCs find innovative solutions to achieve GBON compliance. Country eligibility criteria will be reviewed as part of the design of the next implementation phase.

The complete list of proposed SOFF eligible countries is provided in annex 2. The countries presented in the list include: ODA recipient countries from the DAC List of ODA Recipients effective for reporting on 2021 flows;³⁸ LDC countries per OECD DAC list; and SIDS, per United Nations classification (as a UN coalition fund established as a UN MPTF, all SIDS that are UN members would be eligible for SOFF support).

Eligibility criteria will be reviewed at the end of the First Implementation Period and if needed will be adjusted by decision of the Steering Committee. This includes the review of eligibility for SOFF investment and compliance phase support.

8.2 SOFF grants

SOFF will offer only grant finance. This is justified on the grounds of the global public goods nature of the delivery of observations, the limited fiscal resource base of the recipient countries relative to the investment and recurrent cost financing requirements, and the other points stated in section 5.1.

8.3 SOFF prioritization criteria

It is envisioned that SOFF will direct its support according to a risk-based approach, applying prioritization criteria and a modular implementation with the objective to accelerate GBON compliance and maximize global and local impact. Final prioritization criteria will be approved by the Steering Committee at its first meeting:

- **Close the most significant data gaps:** Emphasis on those geographic areas that currently have the poorest observational coverage, and hence where strengthening the basic weather and climate observing network would most improve the overall quality of the NWP outputs.
- **Target “easy fixes”:** Countries where through relatively small interventions, stations and related infrastructure could be fixed to start quickly delivering the data into the global system.
- **Maximize delivery capacity:** Countries where Implementing Entities and peer advisors have the ability to effectively operate and deliver SOFF support.
- **Create leverage:** Opportunities for blended finance and integration of SOFF funding into larger operations; countries or regions with hydromet/climate projects programmes with satisfactory performance currently implemented by Implementing Entities or under preparation.
- **Ensure balance:** Balanced support among SIDS and LDCs and regions while applying the prioritization principles mentioned above.

Targeted support for Fragile and Conflict-affected States (FCS) may be needed. The criteria listed above could mean that FCSs end up at the bottom of the priority list. To ensure that opportunities for action are not neglected in those countries, and to develop best practices for SOFF delivery in FCS, a specific portion of resources, to be approved by the Steering Committee, could be devoted to mobilizing efforts to implement SOFF in FCS in collaboration with Implementing Entities specifically focused on these countries.

8.4 SOFF phases of support

SOFF support will be provided through three phases (figure 9). All countries requesting SOFF support will have to go through Readiness phase as the first step.



Figure 9. SOFF three phases of support

8.4.1 Readiness phase – Assess the hydromet gap and plan to close the GBON gap

In the Readiness phase a country's overall hydromet priorities and gaps will be reviewed, its GBON gap defined, and a plan to close the GBON gap developed and verified. The following table describes the outputs and responsible partners in this phase.

Table 3. Readiness phase outputs and responsible partners

Outputs	Partner
Country Hydromet Diagnostic, including GBON gap	Country NHMS, peer adviser (advanced NMHS)
GBON gap verification	WMO Technical Authority
GBON National Contribution plan	Country NHMS, peer adviser (advanced NMHS), Implementing Entity WMO Technical Authority (review of GBON regulations consistency)

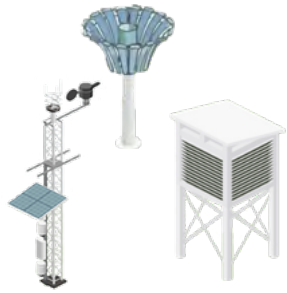

The Readiness phase involves four main steps:

Step 1. Readiness support proposal. Countries will submit a request for SOFF Readiness support through their NMHS and, if applicable, through the respective Implementing Entity in charge of the project or program in which SOFF funding would be embedded.³⁹ The SOFF Secretariat will inform the Steering Committee regularly on the Readiness pipeline and the status of Readiness requests approved by the Steering Committee. Advanced NMHSs will be selected and contracted by the SOFF Secretariat, in coordination with the beneficiary country and in collaboration with the WMO Secretariat, to provide peer advisory services on a cost-recovery basis. The SOFF Secretariat will administer these services (section 7.7). The resource allocation for these services during the Readiness phase will be capped at USD 200.000 per country.⁴⁰

Step 2. CHD and GBON gap assessment. The peer advisor will apply the CHD methodology (box 10 and annex 4). Among the elements assessed in the CHD is the country’s GBON gap. The GBON gap will be verified in line with the GBON regulations (box 8) by the WMO Technical Authority (see step 4 below) and would serve as the analytical basis to develop the GBON National Contribution plan.

Box 9. GBON technical requirements and types of observations

The detailed GBON technical requirements were approved by the WMO Commission for Observation, Infrastructure, and Information Systems in November 2020⁴¹ and will be submitted to WMO Extraordinary Congress for formal approval in October 2021.

 <p>Surface land-based observations</p>	<p>Types of observing stations</p> <p>Surface observations required by GBON include measurements taken at the Earth’s surface of atmospheric pressure, temperature, humidity and (where applicable) snow cover. The measurements are typically obtained using Automated Weather Stations (AWS).</p>	<p>Types of observing stations</p> <p>Members must operate surface land observing stations measuring atmospheric pressure, air temperature, humidity, horizontal wind, precipitation and snow depth, at a horizontal resolution of 200km or higher, and data must be reported hourly.</p> <p>Members with networks operating at higher horizontal resolution must report their observations either at the full resolution of the network or at a minimum resolution of 100km, whichever is higher</p>
 <p>Upper-air land-based observations</p>	<p>Upper air observations required by GBON are vertical profiles - from the surface up to a level of 30hPa (pressure level in the atmosphere corresponding to roughly 22km altitude) - of measurements of atmospheric temperature, humidity as well as wind speed and direction. These measurements are typically provided by radiosondes, which are small instrument packages carried aloft by helium- or hydrogen-filled balloons.</p>	<p>Members must operate a set of upper-air stations over land that observe temperature, humidity and horizontal wind profiles, with a vertical resolution of 100m or higher, twice a day or better, up to a level of 30hPa or higher, with a horizontal resolution of 500km or higher.</p>

Box 10. What are the Country Hydromet Diagnostics?

The CHD are an integrated and operational tool that provides an initial assessment of the National Meteorological Services, their operating environment, and their contribution to high-quality weather, climate, hydrological and environmental services and warnings. The CHD have been developed by the Alliance for Hydromet Development, spearheaded and technically guided by WMO.

The CHD aim to inform priorities for policy and investment decision-making, in particular guiding the members of the Alliance for Hydromet Development with an initial overview of priorities and indication of weaker areas where investments and further assessments are needed. Through the CHD, developing countries will benefit from better targeted and aligned support as the assessment of maturity levels indicates where additional focus and support is needed.

The CHD are an umbrella tool that integrates existing approaches and data provided by WMO Members and partners. It complements and validates this information through a structured peer review process. The WMO Community Platform provides the primary source of data, and the results of the Diagnostics will be integrated into the platform, adding substantial value to it.

The CHD use peer review as their overarching approach, following examples of other organizations, including the Organization for Economic Co-operation and Development (OCED) process for the peer review of members' development assistance. As peers, advanced NMHSs from developed and developing countries undertake the Diagnostics, following the tool. This enables coherent and standardized assessments across countries.

The CHD are being developed and implemented through a phased and learning approach. In the first phase, the prototype was developed by a multi-stakeholder working group. Following the development of the tool, Alliance members partnered with 16 countries⁴² to road-test it.

The countries – both, those assessing and those being assessed – and Alliance members participating in the road-testing, welcomed the CHD as an effective tool and process. They were valued as "authoritative" assessments by peers that established the big picture and corresponding gaps and provided a common basis for more detailed assessments and project preparation.⁴³

The tool is now being refined based on the lessons learned from the road-testing. The refined tool will be available in October 2021. Undertaking a CHD will be a mandatory first step of the SOFF Readiness phase.

Step 3. GBON National Contribution plan development. Based on the verified GBON gap report, the country NMHS supported by the peer adviser, in collaboration with the Implementing Entity, will prepare the GBON National Contribution plan (“GBON plan”). This plan will specify the required investments to close the GBON gap, including infrastructure (stations), telecommunications specifications, installation and operation standards, institutional and human capacity, and training. The GBON plan will constitute the technical basis for the SOFF funding proposal in the SOFF Investment phase (SIDS/LDCs) or for other sources of funding (other OECD/ODA eligible countries; see box 8).

Step 4. WMO Technical Authority review of the GBON National Contribution plan. WMO will review the consistency of the GBON plan with the GBON gap and regulations and issue a technical review note to the SOFF Secretariat to confirm the technical veracity. In case of objections to the GBON gap and/or the plan, WMO will describe the issues and recommend changes. With the support of the peer advisor, the country will revise the gap and/or plan accordingly. The SOFF Secretariat will facilitate the dialogue between WMO, the country and the other partners.

8.4.2 Investment phase – Close the GBON gap

The Investment phase will support eligible countries (SIDS and LDCs) through SOFF-funded infrastructure and capacity development investments to achieve GBON compliance in line with the verified GBON plan. The following table describes the outputs and responsible partners in this phase.

Table 4. Investment phase outputs and responsible partners

Output	Partner
GBON infrastructure installed and operating in compliance with GBON requirements	<ul style="list-style-type: none"> • Country NMHS • Implementing Entities • As requested, technical support to be provided by a peer adviser (advanced NMHS)
GBON human and institutional capacity developed	

SOFF investments will be incorporated as a component of an existing or planned hydromet or climate resilience and adaptation project implemented by an Implementing Entity. This will ensure in-country coordination, ensure effective action across the entire meteorological value chain, gain economies of scale in implementation and reporting, ensure high-quality support from the Implementing Entities to the NMHS for GBON gap closure, and raise the profile of the NMHS with central authorities (e.g., Ministry of Finance or Planning). In cases where a multi-country approach is advisable, an Implementing Entity may combine the GBON plans of several countries under a

regional/multi-country program. In other cases, an Implementing Entity may have a project under implementation related to climate action or in sectors dependent on weather services and may modify the project design to include a new component for SOFF activities.

The investment phase will consist of two steps: preparation and approval, and implementation. The Implementing Entity will be the principal actor in managing these steps in close cooperation with the recipient government and the SOFF Secretariat.

Step 1. SOFF funding proposal preparation and approval. The investment phase begins with the approval of the funding proposal by the SOFF Steering Committee upon recommendation of the SOFF Secretariat. This approved proposal will have sufficient technical information to allow the Implementing Entity to prepare its internal project documentation in coordination with the country's counterpart agencies (the NMHS and the main counterpart ministry of the Implementing Entity, in many cases the Ministry of Finance).

The level of funding will be particular to each country's GBON gap needs. In the most common cases, the Implementing Entity will either:

- use the GBON National Contribution plan to amend an existing hydromet or resilience project under implementation to add the SOFF component; or
- incorporate the SOFF component in a hydromet or resilience project under preparation.

In the spirit of simplification and efficiency, the Implementing Entity will follow its own procedures. Once the SOFF Steering Committee has approved the funding proposal, the Implementing Entity will complete the preparation, appraisal, and negotiation of the project with the country's government authorities and in consultation with the SOFF Secretariat. If the requirements of the GBON plan are fully incorporated in the approved project without significant change, the SOFF Secretariat will be informed of the conclusion of negotiations. If there are substantial differences, the Steering Committee will need to approve the revised GBON National Contribution plan in the project. To ensure coordination at the country level, the NMHS and Implementing Entity will inform the embassies of SOFF funding partners. As the projects will be processed following the Implementing Entity guidelines and procedures, all fiduciary controls, flow of funds, environmental and social risks mitigation, institutional arrangements, and other requirements will be completed with due care by the Implementing Entity. The existing Implementing Entity grievance and control mechanisms will apply.

Step 2. SOFF implementation. Upon completion of step 1, the NHMS (in collaboration with other country agencies, as appropriate) will implement the SOFF supported activities. These activities will include issuing bidding documents to purchase and install equipment for surface observations and human and institutional capacity-building activities. In order to guarantee that the SOFF funded systems meet the GBON regulations, WMO will prepare guidance documents describing expected measurement, communications and other capabilities of hardware or systems to

be purchased and installed. This material can be used in the preparation of tender specifications. Also, as part of the SOFF start-up period, in consultation with HMEI, the hydromet industries' association, detailed guidance will be developed for possible public-private business models under which GBON compliance might be achieved (see section 8.5).

To ensure that SOFF investments and technical assistance are based on the best available science and cutting-edge technology, and tailored to the circumstances of the beneficiaries, SOFF will leverage the ongoing activities of WMO constituent bodies such as the WMO Commission for Observation, Infrastructure and Information Systems. This includes identifying measures to ensure that installation of new weather observation stations will be climate-resilient (measures to mitigate potential risks of flooding, erosion, extreme heat and other issues that could damage and make the weather stations non-operational), monitoring and mitigating the environmental impact of observing technologies, and monitoring and assessing evolving observing technologies and weather and climate prediction modeling capabilities.

The SOFF Secretariat, in collaboration with WMO, will continue to engage with hydromet equipment suppliers to inform them about the SOFF's global program, about equipment procurement opportunities and about the standard technical specifications. To facilitate private sector engagement, HMEI will be part of the SOFF Advisory Board (section 7.4). This effort aims to foster technological and environmental sustainability advancements, promote competition and ensure the most cost-effective solutions for the country and the SOFF.

During project implementation, the Implementing Entity and the NHMS can draw on technical assistance from the peer advisors. The costs of this support will be included in the country's funding proposal and be approved by the Steering Committee. Some of the support areas envisioned include (i) technical advice for bid assessment or evaluation; (ii) advice to ensure the correct commissioning and initial operation of equipment; and (iii) advice to support dispute resolution with suppliers on technical matters; (iv) staff training, capacity building and institutional strengthening.

At the end of the Investment phase, the surface observation equipment should be fully operational and collecting and internationally exchanging data following GBON regulations. The Country NMHS and the Implementing Entity will inform the SOFF Secretariat of the completion of all activities in the Investment phase. A GBON Investment phase completion report will be prepared by the NMHS with the Implementing Entity's support and technical quality assurance. The completion report will describe results achieved and lessons learned. The completion report will also explain the institutional arrangements to secure sustained GBON compliance and SOFF compliance phase support.

8.4.3 Compliance phase – Ensure sustainability with GBON requirements

The Compliance phase will support countries to operate and maintain the basic surface-based observation network and the international sharing of data in full compliance with GBON requirements. While the Investment phase will provide resources to close the GBON gap, SOFF will also consider providing compliance phase support, upon request and as approved by the Steering Committee, for stations that were installed before SOFF intervention. If the NMHS has been operating surface observation stations according to GBON regulations, the country can apply for results-based financing after the issuance of the first annual GBON compliance report and after having conducted the Readiness phase. Given the complexities and significant gaps that several countries face, SOFF will support progressive GBON national compliance, i.e., provision of results-based finance for each compliant GBON station, rather than waiting for the entire national GBON compliance, acknowledging that the ultimate goal is to ensure full national GBON compliance.

The following table describes the outputs and responsible partners in this phase.

Table 5. Compliance phase outputs and responsible partners

Output	Partner
Annual GBON compliance report published, including the assessment of the impact of improved observations in forecast performance.	<ul style="list-style-type: none"> • WMO Technical Authority • Global Producing Centres • SOFF Secretariat • As requested, support to be provided by peer adviser (advanced NMHS) • Trustee
GBON data shared internationally and results-based finance provided	
On-demand GBON operational and maintenance advisory provided	
Weather and climate analysis products freely available through WMO Global Producing Centres	

The compliance phase involves five steps and will continue as long as a country is eligible for compliance grants:

Step 1. Legal Agreement with the country NMHS. The SOFF Trustee will sign a Legal Agreement with the NMHS of the recipient country specifying the requirements and expectations for receiving annual results-based finance for GBON data collected and internationally exchanged.

Step 2. Verification of results. At the end of each calendar year, WMO will prepare a GBON compliance and SOFF impact report, published by the SOFF Secretariat as part of the SOFF annual report. This report will provide the status of GBON compliance per country and globally and, in collaboration with the Global Producing Centres,

will assess progressively the improvement of weather forecast performance linked to increased observations sharing. The report will also provide feedback on the quality of observations. Report production costs will be covered by SOFF resources.

Compliance will be assessed based on publicly available data from the WDQMS (see box 5) and a transparent methodology that includes the definition of the annual average percentage of reporting required to qualify as compliant (see box 11). Final definitions, including specific thresholds, will be decided by the WMO Commission for Observation, Infrastructure and Information Systems at its second session in the first half of 2022. In rare situations where there is a difference of opinion between the NHMS and the WMO on stations' compliance, the SOFF Secretariat will facilitate dialogue between WMO and the NMHS to resolve the discrepancies.

Box 11. GBON monitoring and compliance

While GBON compliance, in general, will be defined for the territory of a country as a whole, SOFF will monitor progress toward compliance on a graduated scale.

The GBON monitoring undertaken by WMO using the WDQMS will therefore deliver the following products to be used as a basis for decisions on SOFF payments: (i) station by station deliverables of observations, expressed as a percentage of expected GBON deliverables and calculated on an annual basis, both for upper air and for surface stations, (ii) total number of observations delivered by the country, expressed as a percentage of total expected GBON delivery, calculated on an annual basis, for upper-air observations and for surface observations. In addition, quarterly GBON monitoring will allow early action and detection of data sharing problems (see step 4 below). See annex 3 for more details.

Step 3. Annual results-based finance disbursed. Upon WMO annual verification of compliance, the SOFF Secretariat will inform the Steering Committee and, on a non-objection basis, give green light to the Trustee to disburse results-based finance to the NMHS. The results-based payment for each compliant station will correspond to a global average of 75% of operating and maintenance costs that include expenditures on the institutional and human capacity required for the operation of the station and the international exchange of observations. Results-based payments will occur annually and represent a contribution to operating and maintenance costs for the year for which compliance has been certified. Given the retroactive nature of the payments, once authorized by SOFF, these payments will be made only on the condition that the resources go to the NMHS. There will be no additional fiduciary requirements. Payments will be made to the NMHS through a jointly held account between the NMHS and the Ministry of Finance. This is based on experience in other UN MPTF programs, e.g., the Fonds National de Stabilisation Economique et Sociale du Mali⁴⁴ and the *Elsie Initiative MPTF*⁴⁵ (a Canadian initiative supporting women's participation in Peace Keeping operations), which delivers results-based finance directly to countries.

Step 4. Continuous GBON compliance monitoring and technical assistance. To avoid end-year surprises, WMO will provide quarterly compliance updates to facilitate periodic monitoring of GBON compliance of a country's stations. The NMHS will also have access to the WQDMS throughout the year to check near real-time status of the country's observations. This will allow the NHMS to take early corrective action on the stations' performance and data sharing and request SOFF technical support if needed. At any time of the year, the NHMS will be able to make a request to the SOFF Secretariat for technical assistance (through the peer advisors) to provide support in addressing possible problems or identified issues with the stations and data sharing. The responsibility for fixing the issues with the station(s) will remain with the NHMS. The reimbursable cost of peer technical assistance will be capped at USD 100,000 for each country for SOFF's First Implementation Period.

8.5 The role of the private sector

The NMHSs in every country have the primary responsibility for the generation, analysis and provision of observational data as well as for the operation and maintenance of the observation infrastructure, but the role of the private sector is rapidly growing. NMHSs face significant challenges, particularly in developing countries, where the lack of resources, basic infrastructure, and technical capacity hinder the provision of high-quality hydromet services. Private businesses are not just consumers of data, they also play an important role as technology providers as well as providers of information and services to parts of the public sector, other businesses and the wider society.

Services generated within the meteorological value chain have significant economic implications. Recognizing this opportunity, the Geneva Declaration was approved in 2019 by the 193 WMO Member States and territories and highlights the "need to strengthen the entire weather, climate and water services value chain", taking into consideration the "evolving capabilities and growing engagement of the private sector in contributing to all links of the value chain and accelerating innovation".

The WMO Data Policy, which is currently being updated and is expected to be approved by the World Meteorological Extraordinary Congress in October 2021, is designed to enhance the free and unrestricted international exchange of Earth observations data. It will benefit the private sector by providing access to a much broader suite of Earth system monitoring and prediction data, allowing businesses to generate value-added products and provide tailored services to specific users. The policy will provide clarity about which types of data must be exchanged on a free and open basis by WMO Member countries and territories ("core data"). GBON data are by definition core data, which means free and open exchange. The private sector operates significant observing networks for its own application and those of its customers. Data from these networks could be made available either as part of GBON or as complementary data. The private sector will also clearly play an important role in SOFF implementation that is further outlined below.

SOFF will support countries in developing the most appropriate approach to partnering with the private sector to achieve the goal of GBON compliance. Four basic business models could be deployed with variations, depending on the specific country context (see annex 5 for details):

- Model 1: Fully State/NMHS owned and operated GBON infrastructure
- Model 2: State/NMHS owned – Private Partner operated
- Model 3: State/NMHS and Private Partner owned – tapping data generated by private sector
- Model 4: Fully owned and operated by a private partner with a direct contract with the State/NMHS

SOFF will provide capacity development support for the NMHS in all four models. The type of support will depend on the model chosen and the country's situation. Emphasis will be put on ensuring that the NMHS maintains basic capacity related to generation and exchange of observations and, for models 2-4, that the State has the expertise and capacity to engage in, monitor and manage the contractual relationships. This includes strengthening regulatory capacity to a level which permits the supervision of the contracts on a permanent basis.

8.6 Social and environmental safeguards and standards

SOFF will rely on the Implementing Entities to apply their social and environmental safeguards as well as gender equality standards. As a pass-through financing mechanism, SOFF will not need to develop and apply its own social and environmental safeguards including grievance redress mechanisms and gender equality standards but will rely on those of the Implementing Agencies. For the results-based finance payments, as noted under section 8.4.3, only the WMO verification of international exchange of observational data will be required to trigger payments to the concerned NMHSs. Representation of CSOs on the Advisory Board will also ensure that views and input from environmental, social and gender equality organizations are reflected in SOFF investment decisions and evolution.

Significant evidence shows that despite gender-differentiated vulnerabilities, women and girls are also powerful agents of positive change before, during, and after disasters occur.⁴⁶ SOFF will work with Implementing Entities and the Advisory Board Members to promote and ensure women's empowerment, including facilitation of capacity building and leadership training to have representation of women in SOFF decision-making activities.

8.7 Risk management strategy

Like every new initiative, SOFF will face certain risks that have to be assessed and managed. Annex 6 summarizes the main risks. They fall into three broad categories: (i) contextual risks; (ii) programmatic risks; and (iii) institutional risks. For each risk item, mitigation responses have been identified. One key overarching risk mitigation instrument is the phasing of SOFF implementation, with the three-year initial implementation period allowing for learning and adaptation (section 9).

8.8 Continuous learning, monitoring, evaluation and reporting

SOFF is built on a long history of lessons learned about the implementation of observing systems in developing countries and will be structured as a learning initiative. Guided by the Steering Committee, the SOFF Secretariat will work closely with WMO, Implementing Entities, NMHS peer advisors, recipient countries and the Advisory Board to track any implementation difficulties and lessons, test alternative implementation options where appropriate, and build on the emerging experience with its innovative delivery and financing model. The SOFF Secretariat will facilitate the exchange of information and knowledge among all SOFF stakeholders. The Secretariat will capture and exchange information in particular in the following areas:

- **Lessons of implementation:** good practices and errors to avoid during the three phases of support, including related to operations and maintenance of surface observation systems and supporting infrastructure;
- **Innovations** in particular related to delivery models, private sector engagement and the creation of links and leverage to “last mile” investments; and
- **GBON compliance and the impact of increased observations** in forecast performance in SOFF supported countries and globally, including through the issuance of the GBON compliance and SOFF impact report (section 8.4.3).

Straddling the third year of the First Implementation Period (see section 9), an independent external evaluation will be commissioned, supported by the Advisory Board, and submitted to the Steering Committee.

8.9 SOFF sustainability

If SOFF is to effectively address the sustainability challenge of observation investments in SIDS and LDCs, its own sustainability will have to be assured. The literature is clear that in the long term sustained provision of global public goods requires a global financing mechanism that involves some form of global financial resource mobilization, similar to the funding of national public goods by national taxation.⁴⁷ However, for now, this option appears to be a distant prospect.

The possibility of having the operations and maintenance expenditures of basic surface-based observation systems funded from fees charged to private business users of the weather information has been explored. However, the WMO unified data policy (currently under discussion by WMO Members) aims to maximize the global benefits of Earth system observations by implementing an open data policy.⁴⁸ Under this framework, the private sector does not have an incentive to pay for the generation of basic observations.

This leaves open the regular “replenishment” option for sustainable SOFF resource mobilization in the foreseeable future. SOFF could organize its own replenishment cycle, based on the experience with the current initial resource mobilization effort. Alternatively, SOFF replenishments could be organized alongside one of the regular replenishments of a major development or climate fund. This might broaden the funder base and make for a more efficient replenishment process. It would also reinforce the notion that SOFF funding is a foundational investment that underpins the effectiveness and sustainability of the investments of other development and climate funds. The Steering Committee, with the support of the Secretariat, will develop a suitable resource mobilization strategy for SOFF beyond the First Implementation Period (see section 9 below).

9.

SOFF programmatic and funding arrangements

9.1 SOFF as a 10-year program with a modular implementation approach

SOFF will initially have a 10-year horizon. Based on feedback from the Second Funders' Forum, on bilateral conversations, and the practice and experience of other UN MPTFs, SOFF will be established as a 10-year program with a modular implementation approach, and an initial focus, including for fundraising, on the First Implementation Period.

There will be three implementation periods of the 10-year program:

- Start-up Period (6 months from the time minimum capitalization is secured; ideally from December 2021)
- First Implementation Period (3 years)
- Expansion and Sustaining Period (6½ years)

9.2 Start-up Period - finalizing SOFF governance and operational arrangements

The Start-up period will begin when minimum SOFF capitalization is secured in agreement with the initial SOFF funding partners. It will end approximately six months later with the first SOFF Steering Committee meeting.

The main activities during this period will consist of the following:

- Structure the SOFF Secretariat administratively hosted by WMO. In close collaboration with UNDP and UNEP, WMO will put in place interim staffing and support functions until the SOFF Secretariat is formally established by decision of the Steering Committee at its first meeting (final terms of reference, budget).
- Prepare first Steering Committee meeting to be held at the end of the start-up period, including:
 - › Fine-tuned SOFF governance arrangements
 - › Advisory Board composition and Terms of Reference
 - › SOFF operational manual
 - › First-year operational program and budget
- Prepare SOFF operations
 - › Update GBON compliance baseline as of 1 January 2022
 - › Identify countries where Implementing Entities are ready to deliver, i.e., countries with ongoing projects where SOFF can be included, as well as an initial project pipeline of quick-win SOFF project initiatives;
 - › Create peer advisors' pool and develop initial GBON technical guidance note(s) to be used by peer advisors and implementing entities
 - › Develop a guidance note on private sector business models for SOFF implementation in collaboration with HMEI
- Continue stakeholder consultations
- Continue fundraising

9.3 First Implementation Period: Targets and funding needs

The First Implementation Period will begin with the first SOFF Steering Committee meeting approving SOFF governance and basic operational documents, tentatively June 2022. It will end three years later.

SOFF preliminary implementation targets and resource needs have been estimated for the First Implementation Period. The long-term objective is for SOFF to achieve GBON compliance of all SIDS and LDCs by the end of the Expansion and Sustaining Period.

Table 6. SOFF preliminary implementation targets

	Outputs	Year 1	Year 2	Year 3	Total
Readiness	1. CHD conducted and GBON gap established and verified	15 countries ^a USD 3 million	20 countries USD 4 million	20 countries USD 4 million (committed)	55 countries USD 11 million
	2. GBON national contribution developed and verified				
Investment	3. GBON infrastructure in place	3 countries ^b USD 12 ^c million (committed)	10 countries USD 40 million (committed)	15 countries USD 60 million (committed)	28 countries USD 112 million (committed)
	4. GBON human and institutional capacity in place				
Compliance	5. Annual GBON compliance report ^d and SOFF impact report produced	1 report USD 0.3 million	1 report USD 0.3 million	1 report USD 0.3 million	3 reports USD 1 million
	6. GBON data internationally shared and results-based finance provided ^e	-	Retroactive payment for 100-200 stations ^f at the end of year 1 USD 5 million ^g	Retroactive payment for 200-400 stations at the end of year 2 USD 9 million	200-400 USD 14 million
	7. On-demand GBON operational and maintenance advisory provided ^h	-	15 countries USD 1.5 million	20 countries USD 2 million	35 countries USD 3.5 million
	8. Weather and climate analysis products freely available through WMO Global Producing Centres	-	-	-	-
Overheads	SOFF Secretariat ⁱ	USD 2 million	USD 2 million	USD 2.5 million	USD 6.5 million
	Implementing Entity fees (7%)	USD 0.8 million	USD 2.8 million	USD 4.2 million	USD 7.8 million
	Trustee fees (1%) ^j	USD 0.2 million	USD 0.5 million	USD 0.8 million	USD 2 million^k
	Total overheads	USD 3 million	USD 5.3 million	USD 7.5 million	USD 16 million
	Contingency				USD 42 million
	Total resource requirements First Implementation Period^l	USD 18 million	USD 56 million	USD 83 million	USD 200 million

Notes: ^a Average USD 200K per country. ^b Countries with resources committed for Investment Phase. ^c Estimated average cost per country based on a global calculation of GBON gap and mix of upper-air and surface-based observations as per GBON requirements. Actual costs per country will depend on the country-specific funding needs. ^d Produced and funded by WMO. ^e This is the average cost of O&M per station based on expert's opinion. It includes an estimation of average human and capacity development costs. ^f Estimated number of SOFF-funded stations (surface and upper air) compliant with GBON data sharing requirements. ^g Rough estimates based on global average cost per upper air and surface-based stations. ^h This is based on a USD 100 K cap for advisory services per country for the First Implementation Period. ⁱ Staffing, operational costs (e.g.travel), reporting and evaluation, communications. ^j Based on expected USD 200 million capitalization spread over three years. ^k Total Trustee fee, including on contingency. ^l Rounded totals.

The implementation targets shown in table 6 are based on the initial assessments and assumptions used in the preparation of the overall results and cost estimates shown in the report for the first and second SOFF Funders' Forum. The targets for the compliance phase (stations that will be operating and internationally sharing data by years two and three) are conservative estimates. It is expected that in several countries there will be opportunities for quick wins in terms of observations sharing that can be achieved through minor interventions. As mentioned in section 8.3 (SOFF prioritization criteria), SOFF will seek to maximize these opportunities. The financial resources shown in table 6 for the investments phase outputs 3 and 4 reflect only commitments. Therefore, the actual gains in terms of observations sharing out of those investments are not fully reflected in this table, since those results will be largely realized after the First Implementation Period.

The resource mobilization target for the First Implementation Period is USD 200 million.⁴⁹ The estimated commitments for this period correspond to USD 158 million. The remaining USD 42 million will allow for possible contingencies, including a greater than expected level of activity, higher than estimated unit costs, and possible delays in the first SOFF replenishment process. Any uncommitted resources at the end of the First Implementation Period will be carried over into the Extension and Sustaining Period. Resource mobilization will be intensively pursued throughout the First Implementation Period, but especially during the first two years, to ensure that the required USD 200 million are mobilized in a timely manner to support the program during that period. A first formal replenishment process will be initiated in the middle of the second year and completed in the middle of the third year to ensure adequate funding for the subsequent periods of SOFF operations.

To ensure an effective startup of SOFF, a USD 50 million minimum capitalization of the SOFF MPTF will be required. This initial capitalization will allow (i) the establishment of the SOFF Secretariat at a minimum critical mass with a reasonable overhead cost ratio; (ii) initiation of the program delivery shown in table 6 above, guided by the prioritization criteria proposed in section 8.3, including in particular quick wins to demonstrate the potential impact of SOFF; and (iii) continuation of active resource mobilization.

9.4 Expansion and Sustaining Period

The Expansion and Sustaining Period will cover the remainder of the 10-year period and will be designed based on lessons learned and the evolving environment. The parameters of the programmatic and resource mobilization approach will be designed in the third year of the First Implementation Period, building on the experience during that period.

An initial independent external evaluation is envisaged for completion by the second quarter of the third year of the First Implementation Period. This evaluation will inform the design and targets of the subsequent Expansion and Sustaining periods, based on approximately two years of implementation experience. Although the track record of SOFF will be limited at that time, the evaluation will provide valuable insights on how to move forward.

9.5 Vision beyond the 10 years

The long-term objective beyond the 10th year is to assure sustained GBON compliance of all beneficiary countries. Sustained compliance may require open-ended technical and financial support considering the likely continued institutional and fiscal constraints in SIDS and LDCs. Continuation of this support can be justified on the grounds that observations represent an essential global public good (see section 8.9).

9.6 Next steps

SOFF third potential Funders' Forum 27 September 2021 (virtual): feedback on draft SOFF Terms of Reference for their finalization

World Meteorological Congress 11-22 October 2021 (virtual): Integrated package of WMO unified data policy, GBON technical regulations and SOFF creation for approval.

SOFF Pledging Forum 28 October 2021 (virtual): Review and endorsement by potential funders of the final version of the SOFF Terms of Reference with the announcement of their pledges or presentation of indications for their expected future support, as appropriate (see draft standard contribution agreement in annex 7).

Legally establishment of the SOFF MPTF by 31 October 2021: UNMPTF Office, WMO, UNDP and UNEP signing of the SOFF Memorandum of Understanding (see draft in annex 8). With the legal establishment of the SOFF MPTF initial contributions can be received as of 1 November 2021.

COP26 SOFF high-level event 3 November 2021 (hybrid): Announcing the creation of the SOFF jointly with the initial funders at a ministerial-level event.

Launch SOFF Start-up Period by 30 November 2021: See section 9.2 Start-up Period.

Launch First Implementation Period June 2022: First Steering Committee meeting; all funders that have committed a hard pledge will be part of the Steering Committee and approve SOFF governance and operational documents.

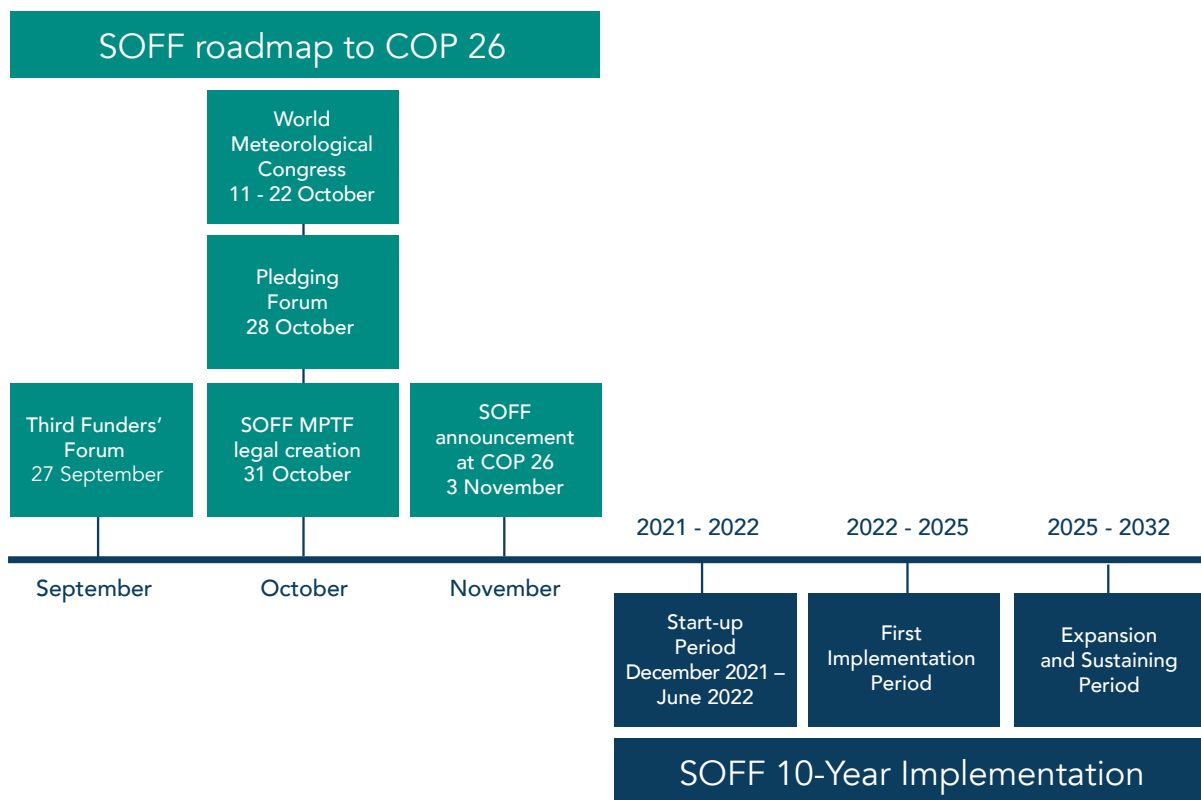


Figure 10. SOFF timeline

Glossary

Adaptation: In human systems, the process of adjustment to actual expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.

Alliance for Hydromet Development: Coalition of 13 climate and development finance institutions. Its goal is to scale up and unite efforts to achieve the common goal of closing the hydromet capacity gap on weather, climate, hydrological, and related environmental services by 2030.

Anticipatory Action: Refers to methods of providing critical support to at-risk communities before disasters occur or at least before the full extent of a disaster's effects occurs. This is done by using forecasts or early warnings of imminent shock or stress with the aim to reduce or mitigate the impact of disasters and enhance post-disaster responses.

Country Hydromet Diagnostics (CHD): A standardized, integrated and operational tool and approach for diagnosing National Meteorological Services, their operating environment, and their contribution to high-quality weather, climate, hydrological and environmental information services and warnings.

Country Support Initiative (CSI): WMO's peer-to-peer advisory service mechanism. It will be fully integrated into the SOFF governance structure and the scope of the advisory services will be tailored to SOFF needs with focus on conducting Country Hydromet Diagnostics including establishing the national GBON gap.

Downscaling: Post-processing of model output aimed at providing estimates of relevant weather and climate parameters on finer local scales than those that are explicitly captured by the model. Often done using a high-resolution Limited Area Model (LAM) to incorporate a detailed representation of local geography.

Early Warning Systems (EWS): Adaptive measure for climate change, using integrated communication systems (comprising sensors, event detection and decision subsystems) to help communities prepare for hazardous climate-related events. Effective EWS involves communities at risk to ensure their awareness and preparedness.

Global Basic Observing Network (GBON): Internationally agreed standard specifying obligations of WMO Members to acquire and internationally 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.

GBON Gap: A country's infrastructure and data sharing status, measured against the GBON regulations.

GBON Plan: Detailed plan that specifies the required investments to close the GBON gap, including infrastructure (stations), telecommunications specifications, installation and operation standards, institutional and human capacity, and training. The GBON plan will constitute the technical basis for the SOFF funding proposal in the SOFF Investment phase or other sources of funding. It will be technically reviewed by the WMO Technical Authority.

Hydromet/weather and climate services: Weather, climate, hydrological, and related environmental services.

Implementing Entities: Entities that will serve as SOFF Implementing Entities for the investment phase – Multilateral Development Banks (the World Bank and the regional development banks) and UN organizations (UNDP, UNEP, World Food Programme). All Implementing Entities are members of the Alliance for Hydromet Development.

Last-mile projects: Activities undertaken primarily at regional, national and local levels. In the weather and climate services value chain, these include local processing, forecast, warning and advisory products; delivery of hydromet services; effective decision-making and action.

National Meteorological and Hydrological Services (NMHS): NMHS own and operate most of the infrastructure that is needed for providing the weather, climate, hydrological and related environmental services for the protection of life and property, economic planning and development, and for the sustainable exploitation and management of natural resources. In some countries the National Meteorological Service (NMS) and National Hydrological Service (NHS) are institutionally separated.

Numerical Weather Prediction (NWP): Computer modeling of the behavior of the atmosphere based on the laws of physics expressed in mathematical equations.

Peer advisors: NMHSs that will serve as advisors for SOFF technical assistance. They have substantial expertise in the areas of advisory services relevant to SOFF, a track record in partnering and supporting other NMHSs, and a commitment to make available adequate human resources.

Resilience: The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure while also maintaining the capacity for adaptation, learning and transformation.

SOFF Advisory Board: Body that will recommend and provide strategic advice to the SOFF. Its objective will be to ensure that SOFF responds to beneficiary countries' needs; that it creates synergies with major adaptation and resilience initiatives, linking SOFF with the "last mile" policy and investment decisions; and that the SOFF strategic direction evolves as GBON evolves.

SOFF eligible countries: In its initial three-year implementation period, SOFF will prioritize support to SIDS and LDCs for all phases of support. All other OECD ODA-eligible developing countries will be eligible for SOFF support under the Readiness phase only.

SOFF Expansion and Sustaining Period: This period will cover the remainder of the 10-year period, after the First Implementation Period.

SOFF First Implementation Period: SOFF initial three-year implementation period.

SOFF Start up-period: This period will begin when minimum SOFF capitalization is secured in agreement with the initial SOFF funding partners. It will end approximately six months later with the first SOFF steering committee meeting. This period's activities consists of establishing the SOFF Secretariat; preparing the first Steering Committee meeting to be held at the end of the start-up period; preparing SOFF operations; continuing stakeholder consultations and fundraising.

SOFF Technical authority: Responsible for confirming the technical aspects of the GBON plan, verifying GBON compliance and providing technical assistance to SOFF peer advisors. WMO plays this role.

SOFF Trustee: The United Nations Multi-Partner Trust Fund Office will serve as SOFF Trustee and will provide fiduciary oversight and other support services in accordance with legal frameworks established between the United Nations, the co-founders and the SOFF funding partners.

Surface observations: Measurements of key meteorological variables (e.g surface pressure, temperature and humidity) taken at or immediately above the Earth's surface.

United Nations Multi-Partner Trust Fund (UN MPTF): The UN mechanism for the administration of pooled financing instruments. SOFF will be established as a UN MPTF that pools contributions from SOFF funding partners.

Upper-air observations: Vertical profiles of measurements of key meteorological variables (typically temperature, humidity, wind speed and direction) extending from the Earth's surface up to altitudes of 20 or 30 km.

Weather and climate prediction products: In this document, the term is used as referring to quantitative output from global models.

WMO Global Producing Centres: Nominated NWP centers that provide WMO Members with a range of freely available forecast products based on their global prediction models.

Annex 1. SOFF Results Management Framework

High-level outcome		Indicator
Improved weather and climate prediction products		NWP standard measures of skill
Outcome		Indicator
Sustained compliance with GBON		# of countries compliant with GBON regulations
Outputs		Indicator
Readiness	1 CHD conducted and GBON gap established and verified	# of projects ^a using the CHD results
	2 GBON national contribution developed and verified	# of GBON national contribution plan developed
Investment	3 GBON infrastructure in place	# of GBON-compliant stations installed and operating and internationally sharing data
	4 GBON human and institutional capacity in place	# of GBON national contribution plans implemented
Compliance	5 Annual GBON compliance report and SOFF impact report produced	Annual reports produced
	6 GBON data international shared and results-based finance provided	Total # of stations internationally sharing observations
	7 On-demand GBON operational and maintenance advisory provided	# of satisfactory advisory services delivered
	8 Weather and climate analysis products freely available through WMO Global Producing Centres	# of Global Producing Centres that provide free and open access to data # of products that have free and open access

Note: ^aThe term projects is used here to define the broader projects in which SOFF will be embedded and that will use the information provided by the CHD as initial input for the design of activities that address several links of the meteorological value chain.

Annex 2. SOFF eligible countries

	Region⁵⁰	Country	Country Group⁵¹
1	Sub-Saharan Africa	Benin	LDC
2	Sub-Saharan Africa	Burkina Faso	LDC
3	Sub-Saharan Africa	Burundi	LDC
4	Sub-Saharan Africa	Central African Republic	LDC
5	Sub-Saharan Africa	Chad	LDC
6	Sub-Saharan Africa	Democratic Republic of the Congo	LDC
7	Sub-Saharan Africa	Eritrea	LDC
8	Sub-Saharan Africa	Ethiopia	LDC
9	Sub-Saharan Africa	Gambia	LDC
10	Sub-Saharan Africa	Guinea	LDC
11	Sub-Saharan Africa	Lesotho	LDC
12	Sub-Saharan Africa	Liberia	LDC
13	Sub-Saharan Africa	Madagascar	LDC
14	Sub-Saharan Africa	Malawi	LDC
15	Sub-Saharan Africa	Mali	LDC
16	Sub-Saharan Africa	Mauritania	LDC
17	Sub-Saharan Africa	Mozambique	LDC
18	Sub-Saharan Africa	Niger	LDC
19	Sub-Saharan Africa	Rwanda	LDC
20	Sub-Saharan Africa	Senegal	LDC

21	Sub-Saharan Africa	Sierra Leone	LDC
22	Sub-Saharan Africa	Somalia	LDC
23	Sub-Saharan Africa	South Sudan	LDC
24	Sub-Saharan Africa	Sudan	LDC
25	Sub-Saharan Africa	Tanzania	LDC
26	Sub-Saharan Africa	Togo	LDC
27	Sub-Saharan Africa	Uganda	LDC
28	Sub-Saharan Africa	Zambia	LDC
29	South Asia	Afghanistan	LDC
30	South Asia	Bangladesh	LDC
31	South Asia	Bhutan ⁵²	LDC
32	South Asia	Nepal	LDC
33	East Asia and Pacific	Cambodia	LDC
34	East Asia and Pacific	Lao People's Democratic Republic	LDC
35	East Asia and Pacific	Myanmar	LDC
36	Middle East and North Africa	Djibouti	LDC
37	Middle East and North Africa	Yemen	LDC
38	Sub-Saharan Africa	Comoros	LDC and SIDS
39	Sub-Saharan Africa	Guinea-Bissau	LDC and SIDS
40	Sub-Saharan Africa	Sao Tome and Principe ⁵³	LDC and SIDS
41	East Asia and Pacific	Kiribati	LDC and SIDS
42	East Asia and Pacific	Solomon Islands ⁵⁴	LDC and SIDS
43	Latin America and the Caribbean	Haiti	LDC and SIDS
44	East Asia and Pacific	Tuvalu	LDC and SIDS

45	East Asia and Pacific	Timor-Leste	LDC and SIDS
46	Sub-Saharan Africa	Cabo Verde	SIDS
47	Sub-Saharan Africa	Mauritius	SIDS
48	East Asia and Pacific	Fiji	SIDS
49	East Asia and Pacific	Marshall Islands	SIDS
50	East Asia and Pacific	Nauru	SIDS
51	East Asia and Pacific	Palau ⁵⁵	SIDS
52	East Asia and Pacific	Papua New Guinea	SIDS
53	East Asia and Pacific	Samoa	SIDS
54	East Asia and Pacific	Tonga	SIDS
55	East Asia and Pacific	Vanuatu	SIDS
56	Latin America and the Caribbean	Antigua and Barbuda ⁵⁶	SIDS
57	Latin America and the Caribbean	Belize	SIDS
58	Latin America and the Caribbean	Cuba	SIDS
59	Latin America and the Caribbean	Dominica	SIDS
60	Latin America and the Caribbean	Dominican Republic	SIDS
61	Latin America and the Caribbean	Grenada	SIDS
62	Latin America and the Caribbean	Guyana	SIDS
63	Latin America and the Caribbean	Jamaica	SIDS
64	Latin America and the Caribbean	St. Lucia	SIDS
65	Latin America and the Caribbean	St. Vincent and the Grenadines	SIDS
66	Latin America and the Caribbean	Suriname	SIDS
67	South Asia	Maldives	SIDS

68	Latin America and the Caribbean	Bahamas	SIDS
69	Middle East and North Africa	Bahrain	SIDS
70	Latin America and the Caribbean	Barbados	SIDS
71	East Asia and Pacific	Federated States of Micronesia	SIDS
72	Sub-Saharan Africa	Seychelles	SIDS
73	East Asia and Pacific	Singapore	SIDS
74	Latin America and the Caribbean	St Kitts and Nevis	SIDS
75	Latin America and the Caribbean	Trinidad and Tobago	SIDS
76	Sub-Saharan Africa	Angola	Other ODA recipient
77	Sub-Saharan Africa	Botswana	Other ODA recipient
78	Sub-Saharan Africa	Cameroon	Other ODA recipient
79	Sub-Saharan Africa	Congo	Other ODA recipient
80	Sub-Saharan Africa	Côte d'Ivoire	Other ODA recipient
81	Sub-Saharan Africa	Equatorial Guinea	Other ODA recipient
82	Sub-Saharan Africa	Eswatini	Other ODA recipient
83	Sub-Saharan Africa	Gabon	Other ODA recipient
84	Sub-Saharan Africa	Ghana	Other ODA recipient
85	Sub-Saharan Africa	Kenya	Other ODA recipient
86	Sub-Saharan Africa	Namibia	Other ODA recipient
87	Sub-Saharan Africa	Nigeria	Other ODA recipient
88	Sub-Saharan Africa	Saint Helena	Other ODA recipient

89	Sub-Saharan Africa	South Africa	Other ODA recipient
90	Sub-Saharan Africa	Zimbabwe	Other ODA recipient
91	East Asia and Pacific	China (People's Republic of)	Other ODA recipient
92	East Asia and Pacific	Democratic People's Republic of Korea	Other ODA recipient
93	East Asia and Pacific	Indonesia	Other ODA recipient
94	East Asia and Pacific	Malaysia	Other ODA recipient
95	East Asia and Pacific	Mongolia	Other ODA recipient
96	East Asia and Pacific	Niue	Other ODA recipient
97	East Asia and Pacific	Philippines	Other ODA recipient
98	East Asia and Pacific	Thailand	Other ODA recipient
99	East Asia and Pacific	Tokelau	Other ODA recipient
100	East Asia and Pacific	Viet Nam	Other ODA recipient
101	East Asia and Pacific	Wallis and Futuna	Other ODA recipient
102	Europe and Central Asia	Albania	Other ODA recipient
103	Europe and Central Asia	Armenia	Other ODA recipient
104	Europe and Central Asia	Azerbaijan	Other ODA recipient
105	Europe and Central Asia	Belarus	Other ODA recipient
106	Europe and Central Asia	Bosnia and Herzegovina	Other ODA recipient
107	Europe and Central Asia	Georgia	Other ODA recipient
108	Europe and Central Asia	Kazakhstan	Other ODA recipient

109	Europe and Central Asia	Kosovo	Other ODA recipient
110	Europe and Central Asia	Kyrgyzstan	Other ODA recipient
111	Europe and Central Asia	Moldova	Other ODA recipient
112	Europe and Central Asia	Montenegro	Other ODA recipient
113	Europe and Central Asia	North Macedonia	Other ODA recipient
114	Europe and Central Asia	Serbia	Other ODA recipient
115	Europe and Central Asia	Tajikistan	Other ODA recipient
116	Europe and Central Asia	Turkey	Other ODA recipient
117	Europe and Central Asia	Turkmenistan	Other ODA recipient
118	Europe and Central Asia	Ukraine	Other ODA recipient
119	Europe and Central Asia	Uzbekistan	Other ODA recipient
120	Latin America and the Caribbean	Argentina	Other ODA recipient
121	Latin America and the Caribbean	Bolivia	Other ODA recipient
122	Latin America and the Caribbean	Brazil	Other ODA recipient
123	Latin America and the Caribbean	Colombia	Other ODA recipient
124	Latin America and the Caribbean	Costa Rica	Other ODA recipient
125	Latin America and the Caribbean	Ecuador	Other ODA recipient
126	Latin America and the Caribbean	El Salvador	Other ODA recipient
127	Latin America and the Caribbean	Guatemala	Other ODA recipient
128	Latin America and the Caribbean	Honduras	Other ODA recipient

129	Latin America and the Caribbean	Mexico	Other ODA recipient
130	Latin America and the Caribbean	Montserrat*	Other ODA recipient
131	Latin America and the Caribbean	Nicaragua	Other ODA recipient
132	Latin America and the Caribbean	Panama	Other ODA recipient
133	Latin America and the Caribbean	Paraguay	Other ODA recipient
134	Latin America and the Caribbean	Peru	Other ODA recipient
135	Latin America and the Caribbean	Venezuela	Other ODA recipient
136	Middle East and North Africa	Algeria	Other ODA recipient
137	Middle East and North Africa	Egypt	Other ODA recipient
138	Middle East and North Africa	Iran	Other ODA recipient
139	Middle East and North Africa	Iraq	Other ODA recipient
140	Middle East and North Africa	Jordan	Other ODA recipient
141	Middle East and North Africa	Lebanon	Other ODA recipient
142	Middle East and North Africa	Libya	Other ODA recipient
143	Middle East and North Africa	Morocco	Other ODA recipient
144	Middle East and North Africa	Syrian Arab Republic	Other ODA recipient
145	Middle East and North Africa	Tunisia	Other ODA recipient
146	Middle East and North Africa	West Bank and Gaza Strip	Other ODA recipient
147	South Asia	India	Other ODA recipient
148	South Asia	Pakistan	Other ODA recipient
149	South Asia	Sri Lanka	Other ODA recipient

* Countries and territories not classified in World Bank income groups

Annex 3. GBON compliance

The specific requirements are proposed in draft form, for information only. Final definitions, including specific thresholds, will be decided by the WMO Commission for Observation, Infrastructure and Information Systems at its Second Session in the first half of 2022.

1. General principle. In preparation for the expected World Meteorological Congress approval of the GBON regulatory material in October 2021, the Executive Council has requested the Commission for Observation, Infrastructure and Information Systems (Draft Recommendation 4.2(2)/1 (EC-73)) to *“immediately initiate development of technical guidelines, processes and procedures needed to ensure expedient and efficient implementation of GBON and to prepare for effective performance and compliance monitoring of the network”*. This compliance monitoring will be implemented for all 193 WMO Members. As a general principle, SOFF will base its investment and ongoing support decisions on data provided by WMO’s monitoring of GBON compliance, and SOFF does not intend to establish a separate compliance monitoring framework (see Axx.5).

2. Potential variance with GBON regulations. Recognizing that even well-resourced WMO Members may have difficulties fully meeting the GBON requirements in certain remote and inaccessible areas, the GBON regulatory text includes the following waiver clause (WMO No. 1160, draft provision 3.2.2.6): *If a Member finds that the horizontal resolution required according to one or more of provisions 3.2.2.7 - 3.2.2.18 is not practically achievable for the observing network within parts of their territory, e.g. in uninhabited and remote areas, the Member shall inform the Secretary-General of the reasons as per Article 9(b) of the WMO Convention, and paragraph 6 of “GENERAL PROVISIONS”*. In general, any Member has the sole authority to decide if and when to invoke Article 9(b) of the WMO Convention. For Members designated as SOFF beneficiaries during the Investment and Compliance Phases, any decision to invoke Article 9(b) specifically due to inability to fully meet the GBON requirements shall be subject to approval of the SOFF Steering Committee.

3. Network density compliance. A WMO Member shall be considered compliant with the GBON network density requirements if and only if the WMO Commission for Observation, Infrastructure and Information Systems (or its designee) has verified that the proposed National GBON Contribution can plausibly be expected to deliver the required variables at the required spatial and temporal density. The decision on whether the standard network density requirements (draft provision 3.2.2.7) or the high-density requirements (draft provision 3.2.2.8) apply to a given SOFF beneficiary Member shall be made by the SOFF Steering Committee in consultation with the respective Member.

4. GBON compliance. GBON compliance is measured using data provided by the WIGOS Data Quality Monitoring System, which tracks the delivery of observational data to (currently) four NWP Centres, namely NCEP (USA), ECMWF (international, based in UK, Germany and Italy), DWD (Germany) and JMA (Japan). Compliance is measured on a quarterly basis. The WMO Commission for Observation, Infrastructure and Information Systems will issue quarterly GBON Compliance Reports for all WMO

Members based on WQMS data. The GBON Compliance Reports will be published no later than by the end of the first quarter of the following calendar year.

4.1 Delivery of surface observations. A Member shall be considered compliant with the requirements for the provision of surface observations if more than 90% of the required observations (all variables), for at least as many locations as are required to meet the required horizontal resolution, arrive at one or more of the WQMS monitoring centres on more than 90% of the days in that particular year.

4.2 Delivery of upper air observations. A Member shall be considered compliant with the requirements for the provision of upper air data if at least two radio soundings (all variables) per day, extending from the surface up to a level of 100 hPa or higher, for at least as many locations as are required to meet the required horizontal resolution, arrive at one or more of the WQMS monitoring centres on at least 90% of the days in that particular year. Some (or all) of the radio soundings may be replaced by aircraft-based measurement of the same variables at equivalent spatial and temporal density. For aircraft-based measurements, the minimum required altitude is relaxed to 300 hPa.

4.3 Definition of GBON compliance. A Member shall be considered compliant with the GBON provisions if delivery of both surface observations and upper air observations meet the criteria specified in Axx.4.1 and Axx 4.2.

4.4 GBON data quality. The quality of GBON observations from all Members will be continuously monitored by the global NWP centres participating in the WIGOS Data Quality Monitoring System (WQMA), and continuous quality improvement efforts for all Members will be undertaken by the Regional WIGOS Centres (RWCs). Through the SOFF annual compliance and impact report, WMO will provide all available information gathered by the WQMS and the RWCs about the data quality of the SOFF-funded observations to inform and advise the Steering Committee.

5. Specific GBON monitoring products for SOFF. While GBON compliance in general will be defined for the territory of a Member as a whole, SOFF will need to monitor progress toward compliance on a graduated scale. The GBON monitoring undertaken by WMO using the WQMS will therefore deliver the following products to be used as a basis for decisions on SOFF payments: (i) station by station deliverables of observations, expressed as a percentage of expected GBON deliverables and calculated on a quarterly basis, both for upper air and for surface stations, (ii) total number of observations delivered by the country, expressed as a percentage of total expected GBON delivery, calculated on a quarterly basis, for upper air observations and for surface observations.

Annex 4. National Meteorological Services peer review and advisory services

(Adjusted Country Support Initiative integrated into SOFF)

1. SOFF peer review and advisory support

Peer review and advisory support is a foundational element for SOFF implementation. In 2019, the World Meteorological Congress decided to establish the Country Support Initiative (CSI) as WMO's peer-to-peer advisory service mechanism, with its own governance structure, including a Steering Committee comprised of funding partners as decision-makers and an independent Secretariat accountable to the funding partners.⁵⁷

As the CSI has not yet been created and to avoid institutional fragmentation and to reduce costs, the CSI peer advisory services will be adjusted in terms of scope and administratively fully integrated into the SOFF governance structure. Given the SOFF urgency and opportunity, the scope of CSI advisory services provided by WMO Members on a peer-to-peer basis will be tailored to SOFF needs, focusing on:

- conducting Country Hydromet Diagnostics including establishing the national GBON gap
- supporting the development of the GBON national contribution
- advising on the integration of SOFF into broader hydromet/climate projects of the respective Implementing Entities, and
- on-demand continuous advisory support during the SOFF investment and compliance phases.

Section 3 describes the CSI advisory services as tailored to SOFF needs in more detail.

Relevance, effectiveness and efficiency of the CSI peer advisory services will be assessed as part of the SOFF initial external evaluation to be conducted in the third year of SOFF operations. Based on the initial experience and the envisioned evolution of GBON and SOFF, options to deliver additional advisory services as envisaged with the CSI original concept will be explored.⁵⁸

2. SOFF peer advisors

Having a strong pool and high-quality provision of peer advisory services is key to the success the SOFF. SOFF peer advisors will be NMHSs that have substantial expertise in the areas of advisory services for SOFF (see section 3), a track record in partnering and supporting other NMHSs, and a commitment to make available adequate human resources. The thorough selection and endorsement of the advisors that create the pool of peer advisors will be an essential part of the quality assurance process.

The selection of peer advisors from the pool for specific assignments will follow criteria related to regional expertise, language, experience in partnering with the beneficiary country, and most importantly beneficiary countries' preferences. SOFF peer advisors are responsible for mobilizing additional expertise, as needed, in order to deliver quality advisory services. SOFF will seek to secure long-term partnerships throughout the three phases of support.

The WMO Secretariat will endorse the NMHSs interested in serving as peer advisors and will establish the pool of peer advisors. This will be done in coordination with the SOFF Secretariat and in dialogue with the interested meteorological offices and according to transparent criteria. Particular emphasis will be given to promoting South-South peer advisory arrangements, as demonstrated in the CHD road-testing phase.

The selection and allocation of peer advisor to a country will follow the process as presented below:

- WMO Secretariat endorses interested NMHS peer advisors and creates the pool of peer advisors, updated on annual basis
- SOFF Secretariat issues regular calls for expressions of interest to this pool based on incoming country demand
- SOFF beneficiary country decides on the peer advisor in collaboration with SOFF Secretariat, WMO Secretariat and the Implementing Entity
- SOFF Secretariat establishes the contracts and monitors the provision of advisory services
- WMO Secretariat provides dedicated technical support to the peer advisors in order to ensure that their reviews and advice are consistent with WMO standards and guidance (see item 6 below)

3. Scope of peer advisory services

SOFF peer advisory services will be provided through four "advisory products" across the three phases of SOFF support (readiness, investment, compliance).

3.1 Country Hydromet Diagnostics (Readiness Phase)

The CHD are a standardized, integrated, operational tool and approach for assessing National Meteorological Services (NMS), their operating environment, and their contribution to high-quality hydromet development. The CHD aim to inform hydromet policy and investment decision-making, in particular, to guide coordinated investments, and their sequencing, from members of the Alliance for Hydromet Development and other funders. The CHD informs SOFF investments to close the GBON gap as well as effective integration of SOFF into larger hydromet development projects supported by the SOFF implementing entities and other partners.

To conduct the CHD, peer reviewers will work with meteorological offices of the SOFF beneficiary country to conduct the maturity-based assessment across ten different critical elements, using standardized criteria. It is expected that through the technical expertise of the peer reviewers, they will be able to, in dialogue with countries and Implementing Entities, provide advice on areas of prioritization on how to sustainably close the GBON gap and the integration of SOFF into the larger project supported by the Implementing Entity.

Table A. The 10 elements in the Country Hydromet Diagnostics

The CHD provides a maturity assessment of the NMS, their operating environment, and their contribution to high-quality hydromet services. The ten elements are grouped into four categories, helping to identify where additional focus and support may be needed:

<p style="text-align: center;">Enablers</p> <p>A Governance and institutional setting. Formalization of the NMS mandate and its implementation, oversight and resourcing.</p> <p>B Effective partnerships to improve service delivery. Effectiveness of the NMS in bringing together national and international partners therefore improving the service offering.</p>	<p style="text-align: center;">Service and product development and dissemination</p> <p>F Warning and advisory services. NMS role as the authoritative voice for weather-related warnings and its operational relationship with disaster and water management structures.</p> <p>G Contribution to climate services. NMS role in and/or contribution to a national climate framework according to the established climate services provision capacity.</p> <p>H Contribution to hydrology services. NMS role in and contribution to hydrological services according to mandate and country requirements.</p> <p>I Product dissemination and outreach. The effectiveness of the NMS in reaching all public and private sector users and stakeholders.</p>
<p style="text-align: center;">Observation and data processing system</p> <p>C Observational infrastructure. The level of compliance of the observational infrastructure and its data quality with prescribed standards.</p> <p>D Data and product management and sharing policies. The nature of data and product sharing on a national, regional and global level.</p> <p>E Numerical model and forecasting tool application. The role of numerical model output and forecasting aids such as remote sensed products in product generation; whether models are run internally and if the value-added compared to global models is determined.</p>	<p style="text-align: center;">User and stakeholder interaction</p> <p>J Use and national value of products and services. Accommodation of public and private sector users and stakeholders in the service offering and its continuous improvement.</p>

3.2 GBON National Contribution plan, including private sector role for operation and maintenance of the GBON network (Readiness phase)

- **Peer reviewers will work with meteorological offices to develop a detailed plan for complying with GBON regulations.** This phase will include consideration of regional requirements (for example, neighboring countries should ideally coordinate on the placement of upper air and surface stations, to exchange these data directly supporting seamless cross-border services). The plan will consider network sustainability, data exchange and quality standards, practical issues of maintenance, ongoing funding and partnership arrangements

3.3 Advice on the integration of SOFF into broader hydromet projects/ programs (Readiness phase)

- **Peer NMHSs will provide advice on how SOFF investments can be seamlessly be integrated within larger investments provided by the Implementing Entities.** Closing the GBON gap is foundational for all hydromet services, but the realization of its value and benefits can only be realized if the improvement in observations and prediction products is anchored into broader last-mile hydromet capacity development.

3.4 On-demand continuous technical assistance for GBON infrastructure operation and maintenance (Investment and Compliance phases)

SOFF will offer continuous on-demand peer advisory services during the investment and compliance phase to ensure effective implementation of GBON investments, smooth operation and maintenance of the GBON network, and continuous data sharing. SOFF aims at providing rapid response hands-on assistance through the peer advisors while ensuring that peers have an adequate estimation of the expected advisory demands and can prepare and make the required resources available accordingly. In general, such collaboration is best undertaken through long-term collaborative relationships that might also align with training and cross-sectoral arrangements (for example, some countries have decades-long partnerships across multiple portfolios), but ad-hoc advice may also be required from time to time.

4. Delivery arrangements

4.1 SOFF Secretariat: coordination and administration role

The SOFF Secretariat will administer the provision of meteorological services peer advisory services to beneficiary countries and Implementing Entities, in collaboration with the WMO Secretariat and Trustee. The SOFF Secretariat will issue regular calls for expression of interest and supports the beneficiary country in the selection of the peer reviewer/advisor, in collaboration with the WMO Secretariat and the Implementing Entity when applicable.

The UNMPTF Office will transfer resources to the SOFF Secretariat for contracting peer advisory services. The SOFF Secretariat will issue the contract for the selected NMHS to provide the peer advisory services and will handle the payments and all contractual matters. The SOFF Secretariat will monitor the timely delivery of the advisory services by the peer review/advisor.

4.2 WMO Secretariat: technical role

The WMO Secretariat will provide dedicated technical standards, guidance and support for the provision of the peer review and advisory services, in particular

- identify and endorse the meteorological peer reviewers and advisors, i.e. establish the pool of peer advisors
- develop GBON technical guidance to be used by SOFF peer advisers and Implementing Entities, including guidance notes, tools etc.
- provide on-demand technical backstopping to the peer advisors
- in collaboration with all Alliance for Hydromet Development members regularly refine the Country Hydromet Diagnostics tool to reflect lessons learned and evolving standards.

4.3 Clients

The peer advisors will provide their services to two main clients: (i) SOFF beneficiary countries represented by the NMHSs; and (ii) Implementing Entities, which will support the country in the SOFF investment phase.

Client relationship management guidelines will be developed jointly by the SOFF Secretariat and the WMO Secretariat. The quality of these relationships will also be critical to the overall quality of the program outputs.

4.4 Pricing

Peer advisory services will be provided on a cost recovery basis. Total cost will largely vary depending on the supported country context, peer advisor, travel and other logistic implications.

5. Quality assurance

The SOFF is a major initiative to enhance a global basic observing network that underpins quality hydromet services⁵⁹. Quality management and risk management frameworks for the provision of peer advisory services will be developed jointly by the interim SOFF Secretariat and WMO Secretariats during the 6-months SOFF start-up phase, in collaboration with the initial pool of peer advisors, for the provision of the peer advisory services.

The quality of peer advisory services will be assured at three levels:

- **WMO Secretariat technical guidance and support:** The WMO Secretariat will provide technical guidance and support to peers. In addition to developing “how to” guidance notes and tools, the WMO Secretariat will ensure provision of support to peer advisors on as-needs and scalable basis, for example by providing support to CHD assessments. This will ensure that peers will be entirely familiar and acknowledgeable with the guidance and standards related to GBON and the implementation of the Country Hydromet Diagnostics.
- **Client reception:** the client (country and/or implementing entities) are expected to provide feedback on the quality of support received. Payments to peer advisors will require satisfactory approval of the delivered advisory services and products. In case of disagreements between the client and the peer advisor a two-step process is foreseen. First, the SOFF Secretariat with technical support from the WMO Secretariat will facilitate actions to ensure satisfactory delivery to the client. Second, if this fails, independent and pre-identified experts will review the situation and provide advice.
- **Continuous monitoring, external evaluation and learning related to the provision of peer review and advisory services.** The SOFF Secretariat will systematically capture feedback from clients, conduct an annual self-evaluation including by the peers, and an independent evaluation will take place in the third year of SOFF operation that will include the provision of peer review and advisory services.

6. Risk management

In the three-year initial implementation period the delivery of 55 CHD and corresponding advisory services are envisioned. The CHDs will also form the basis for the second Alliance Gap Report to be issued in the fourth quarter of 2023. The delivery of 55 CHDs in the first three years of SOFF operation requires:

- sufficient country demand for SOFF support
- sufficient peer review delivery capacity, i.e. a large enough pool of qualified reviewers/advisors. Peer advisors will need predictability to ensure sufficient human resources and/or contracting-in expertise
- availability of WMO Secretariat technical support from guidance notes to on-demand technical support to peer advisors
- high degree of standardization, from contractual arrangements to provision of WMO Secretariat support to peer reviewers.

Key to achieving a high number of CHD will be standardization and close attention to demonstrated quality and throughput of CHD production. The CHD is a key 'brand' of the Alliance, including WMO, and must have credibility as a foundational process for SOFF and other investments. Risk management approaches will be further fleshed out during the SOFF start-up phase.

Annex 5. Private sector support for SOFF implementation

Archetypal business models

1. Context

The NMHSs in every country have the primary responsibility for the generation, analysis and provision of observational data as well as for the operation and maintenance of the observation infrastructure. However, NMHSs face significant challenges, particularly in developing countries, where the lack of resources, basic infrastructure, and technical capacity hinder the provision of high-quality hydromet services.

The role of the private sector is rapidly growing, particularly in developed countries. Technological advances and open data policies have created space for a broader role of the private sector in the provision of hydromet services. Private businesses are not just consumers of data that are essential for various sectors reliant on weather and climate, they also play an important role as technology providers as well as providers of information and services to parts of the public sector, other businesses and the wider society.

Services generated within the meteorological value chain have significant economic implications. The socio-economic benefits of a well-functioning value chain can be underestimated by governments, especially in developing countries. Leveraging private sector capabilities, without jeopardizing the provision of public services, is a key condition to maximize socio-economic benefits⁶⁰.

Recognizing this opportunity, the Geneva Declaration was approved in 2019 by the 193 WMO Member States and territories and highlights the “need to strengthen the entire weather, climate and water services value chain – from acquisition and exchange of observations and information, through to data processing and forecasting, and service delivery – to meet growing societal needs”, taking into consideration the “evolving capabilities and growing engagement of the private sector in contributing to all links of the value chain and accelerating innovation”.

The policy framework in the backdrop is the WMO Data Policy. The Policy is currently being updated to enhance the free and unrestricted international exchange of diverse Earth observations data. The new Unified WMO Data Policy (expected to be approved by the World Meteorological Congress in October 2021) will benefit the private sector by providing access to a much broader suite of Earth system monitoring and prediction data, allowing businesses to generate value-added products and provide tailored services to specific users. The policy will provide clarity about which types of data must

be exchanged on a free and open basis (“core data”). GBON data are defined as core data. Achieving and sustaining GBON compliance is a national responsibility and SOFF will support GBON compliance for countries with limited resources and capacities.

This note explores the role of the private sector in the first part of the meteorological value chain – the generation and exchange of observations – and, more precisely, in the implementation of SOFF. Four archetypal business models have been developed in collaboration with HMEI. They constitute basic models that will be applied with variations in a manner tailored to country circumstances.

2. Archetypal business models

Four potential archetypal business models are being considered for the implementation of SOFF. The decision as to which model or variations of models a country will use will depend on the country-specific context including considerations about:

- (i) WMO Member roles and responsibilities that can vary from country to country
- (ii) local incentives for the private sector to engage with SOFF investments
- (iii) required pre-conditions for the model to work e.g., governance, regulatory framework, etc.

Depending on the country-specific context, variations of the archetypal business models could be pursued. Regardless of the model, WMO member countries and territories will have to internationally exchange GBON on a free and open basis. SOFF will not advocate for a specific model but engage with countries to identify the most suitable model to achieve the objective: achieving sustained GBON compliance, i.e. international exchange of GBON data. Through its peer advisors and technically supported by WMO, SOFF will support countries in identifying the best option. The private partner may also be a not-for-profit entity or social enterprise. Each of these models is discussed below.

2.1 Public model

Fully State/NMHS owned and operated

In many countries, the State has full control of the hydromet services, including the generation of observations. In this model, single components of the observing system can be outsourced to commercial entities. However, in developing countries, this model often results in the lack of adequate funding and capacity to operate, leading to gaps in data.

2.2 Observation as a service model

State/NMHS owned – Private Partner operated (BOT: Build – Operate – Transfer)

Under this model, the State contracts a private partner to design, construct and operate the basic observations infrastructure, which is fully publicly funded. The partner is in charge of operation and maintenance. Data ownership remains with the State/NMHS. Data are in the public domain without usage fees. The commercial use of data by the contracted partner is possible. The data can be used to develop commercial activities using economies of scale. Under such arrangements, country-tailored agreements are necessary.

In this model, the State has a significant amount of control over the setup, operation and data delivery via the contract with the private sector and can take a long view concerning the sustainability of the system. It also provides incentives for private sector partners to provide quality products to have the opportunity to engage long-term contracts.

2.3 Concession model

State/NMHS and Private Partner owned– BOOT (Build – Own – Operate – Transfer)

Under this model, at least partial investments by the contracted private partner enable the observation system to be built, unlike under model 2 which is funded upfront by the public sector. The contractor is responsible for operation and maintenance. Data ownership is with the contractor. The State pays the contractor to make data available in the public domain free of charge. Payment occurs after data delivery. Data have to be delivered in a form that fulfills GBON criteria. The contractor has an incentive to build commercial services on the data gathered. Country-tailored agreements are necessary.

For such a model to be successful, the partner from the private sector needs to have enough confidence in its own ability to capitalize on the available opportunities in order to make upfront investments and ensure timely delivery of quality approved data. This model can be particularly beneficial to overcome the temporary shortcomings of an NHMS.

2.4 Data as a service model

Fully private owned and operated by a private partner with a direct contract with the State/NMHS

This model would typically be used where there are already existing observation systems operated by private entities which adapt or enlarge their systems to meet the GBON criteria. The contractor is responsible for operation and maintenance. Data ownership is with the contractor. A concession is required for the NMHS to use and share the data free of charge in the public domain. The contracted partner can provide further commercial services. This model encourages a competitive market. Country-tailored agreements are necessary.

An increasing number of private sector participants run observation systems that could be upgraded or adapted to GBON/SOFF standards. This model makes use of existing infrastructure and capacity and spurs innovation.

3. Risk management

	Public Model		Observation as a service model		Concession model		Data as a service model	
	Public	Partner	Public	Partner	Public	Partner	Public	Partner
Implementation	X			X		X		X
Operation	X			X		X		X
Force Majeure	X			X		X		X
GBON-compliance	X			X		X		X
(Pre)finance	X		X	X		X		X
Regulation	X		X		X		X	
Political risk	X		X			X		x

Depending on the model selected, countries would undertake country-specific tenders with support of the SOFF implementing entity and approval by the SOFF Steering Committee. The selection criteria could include amongst others: skills and experience (including in the local environment) and financial capabilities. Care would be given to avoid structures with a potential for future monopolistic market domination by single entities (either from the public or private sector side).

SOFF will provide capacity development support for the NMHS in all four models. The type of support will depend on the model chosen and the country's situation. Emphasis will be put on ensuring that the NMHS maintains basic capacity related to generation and exchange of observations and, for models 2-4, that the State has the expertise and capacity to engage in, monitor and manage the contractual relationships. This includes strengthening regulatory capacity and the ability to supervise the contracts.

Annex 6. Preliminary risks identification and potential mitigation strategies for SOFF

RISKS	MITIGATION STRATEGIES
CONTEXTUAL RISKS	
<p>Conflict and safety/political insecurity in countries where funded initiatives are to be implemented, negatively affecting selection of countries and implementation (e.g., delays)</p>	<p>In some countries, the political, economic, or social situation may be such that conflict or general insecurity may arise. Associated risks and volatility could limit the willingness/ability of the Implementing Entities to prepare hydromet projects with a SOFF component and/or this could negatively affect project implementation and slow or hinder progress and the achievement of outcomes.</p> <p>For each funded project and initiative, a specific risk management framework will be developed that includes a high risk country/regional assessment and mitigation measures for direct and indirect political risks with a focus on possible conflict or instability, in cooperation with the Implementing Entities.</p> <p>SOFF Secretariat will work with Implementing Entities (in particular those with a large experience in fragile and conflict-affected states e.g. WFP) to assess the situation and explore opportunities to promote hydromet projects in this group of countries. A special quota of funding may be reserved for countries with instability or conflict.</p>
<p>Potential need for multi-country SOFF engagement may not appeal to all Implementing Entities</p>	<p>SOFF metrics of success – data delivery at endpoints thousands of km away from the origin of the observations – may necessitate the implementation of activities along the data delivery chain, in some cases partly outside the country from which the data are missing. This may limit the effectiveness of potentially ear-marked funds and will have to be explained to funders.</p> <p>SOFF Secretariat in collaboration with WMO will work proactively with recipient countries and Implementing Entities to ensure a supranational regional focus where needed.</p>
<p>Insufficient institutional capacity and/or political commitment in recipient countries to ensure successful implementation of SOFF investments</p>	<p>Lack of institutional capacity or political support in recipient countries may hamper implementation.</p> <p>During the Readiness phase, capacity limitations will be assessed and needed capacity-building measures identified for implementation during the Investment phase. The SOFF Secretariat, jointly with Implementing Entities, will communicate with country counterpart organizations to build effective engagement and political support.</p>

PROGRAMMATIC RISKS	
Limited Implementing Entities' engagement and/or difficult partner coordination during Readiness and Investment phases	<p>SOFF depends on Implementing Entities' engagement in the hydromet sector in SIDS and LDCs, but not all of them may be requesting assistance, or Implementing Entities may not be able to respond to all requests during the initial five-year SOFF implementation period.</p> <p>SOFF Secretariat will focus on countries promising "early wins" during the initial three years of implementation; in addition, it will engage intensively with all Implementing Entities, the Alliance for Hydromet Development and with recipient countries in programming SOFF investments to ensure maximum coverage of SIDS and LDCs.</p>
Limited or poor-quality peer support for readiness phase and capacity building during investment phase and on-demand support during compliance phase	<p>SOFF will rely on technical support from NMHS peers for its successful implementation. This may not be forthcoming or of poor quality.</p> <p>The SOFF Secretariat in collaboration with WMO Secretariat will actively reach out to peers and monitor and report on the implementation of peer support on an ongoing basis.</p>
Insufficient investment in downstream components of the hydromet value chain. This will limit the motivation of the NMHS to actively engage in SOFF implementation activities	<p>Reaping the full benefit from improved observations will depend on the effective development of the entire hydromet value chain. Insufficient attention to downstream components will reduce the benefits from improved observations to the recipient country.</p> <p>The Country Hydromet Diagnostics gap analysis during the Readiness phase will assess the entire value chain and identify gaps across it. SOFF components will be embedded in broader hydromet projects of Implementing Entities, which are expected to address other key constraints in the hydromet value chain. Other downstream financing partners and initiatives are proposed to be included in the SOFF governance structure, allowing them to both, shape and take advantage of SOFF. The Advisory Board will specifically focus on ensuring that the links between upstream and downstream activities are as effectively developed as possible.</p>

<p>Investments have detrimental environmental or social impacts</p>	<p>SOFF funded investments may have detrimental social or environmental impacts, e.g., encroaching on limited natural resources; or observing stations built in protected areas, on fragile or indigenous land; or requirements for land acquisition and involuntary resettlement.</p> <p>Implementing Entities will ensure that the social and environmental policies are properly applied to the SOFF components of hydromet projects.</p> <p>In addition, SOFF will work with WMO and private sector partners (e.g., HMEI) to pioneer the use of modern technologies to mitigate negative environmental impacts, e.g., of the use of radiosondes.</p> <p>National transition to modern technologies (e.g., from manual to automated observing systems) will need to be planned and managed carefully, taking into account both technical capabilities and structural issues around current staff profiles and training needs.</p>
<p>Non-compliance with fiduciary and procurement standards</p>	<p>During the Investment phase, SOFF will rely on Implementing Entities to ensure their regular fiduciary and procurement standards are met.</p>
<p>INSTITUTIONAL RISKS</p>	
<p>SOFF Secretariat administrative capacity is limited, especially during the start-up phase</p>	<p>During the start-up phase, the SOFF Secretariat is expected to draw on advisory support from UN MPTF; beyond start-up, the host agency and the Steering Committee will proactively work to ensure that the Secretariat is appropriated staffed and resourced. During the First Implementation Phase lessons will be continuously drawn and administrative practices adjusted as needed.</p>
<p>SOFF is mismanaged, compromising its operations and causing reputational damage</p>	<p>UN MPTF has strict trust fund management procedures in place to mitigate such risk. The proposed governance structure has been designed to ensure appropriate policies are developed, implemented, monitored and evaluated, ensuring full oversight of the Facility, as well as full reporting, transparency and accountability functions.</p>

SOFF is not able to mobilize sufficient resources or interest from funders and investors to reach optimal operational levels or function at full capacity and/or initial fund-raising targets not compatible with the willingness of funders to commit

The SOFF will launch only if it has sufficient commitment from contributors to establish the first pipeline of country programs. An active resource mobilization effort is underway and will continue during the early phases of implementation, with the engagement of UNDP, UNEP and WMO. Targets concerning country coverage will be adjusted in line with available resources, based on consultations with funders.

Annex 7. SOFF Standard Administrative Arrangement for contributions

STANDARD ADMINISTRATIVE ARRANGEMENT FOR SYSTEMATIC OBSERVATIONS FINANCING FACILITY USING PASS-THROUGH FUND MANAGEMENT

**Standard Administrative Arrangement
between
[Name of Donor],
and
the UNDP Multi-Partner Trust Fund Office**

WHEREAS, Participating United Nations Organizations (respectively WMO, UNEP and UNDP) that have signed a Memorandum of Understanding (hereinafter referred to collectively as the "Participating UN Organizations") have developed the Systematic Observations Financing Facility [name of Multi-Donor Trust Fund] (hereinafter referred to as the "Fund") starting on [start date] and ending on [end date] (hereinafter "End Date"), as may be amended from time to time, as more fully described in the Terms of Reference of the Multi-Donor Trust Fund (hereinafter referred to as the "TOR"), a copy of which is attached hereto as **ANNEX A**; and have agreed to establish a coordination mechanism (hereinafter referred to as the "Steering Committee", an Advisory Board and a Secretariat) to facilitate the effective and efficient collaboration between the Participating UN Organizations for the implementation of the Fund;

WHEREAS, the Participating UN Organizations have agreed that they should adopt a coordinated approach to collaboration with donors who wish to support the implementation of the Fund and have developed a TOR to use as the basis for mobilising resources for the Fund, and have further agreed that they should offer donors the opportunity to contribute to the Fund and receive reports on the Fund through a single channel;

WHEREAS, the Participating UN Organizations have appointed **the United Nations Development Programme** (hereinafter referred to as the "Administrative Agent") (which is also a Participating UN Organization in connection with the Fund) through the Multi-Partner Trust Fund Office in a Memorandum of Understanding (hereinafter referred to as the "MoU") concluded between, the Administrative Agent

and Participating UN Organizations on **[date]**, attached hereto for informational purposes as Annex C to serve as their administrative interface between donors and the Participating UN Organizations for these purposes. To that end the Administrative Agent has established a separate ledger account under its financial regulations and rules for the receipt and administration of the funds received from donors who wish to provide financial support to the Fund through the Administrative Agent (hereinafter referred to as the "Fund Account");

WHEREAS, the Participating UN Organizations have agreed that the World Bank, through the International Bank for Reconstruction and Development and the International Development Association, and any additional relevant Multi-Lateral Development Banks (collectively, hereinafter referred to as the "Bank"), may participate in and receive funding from the Fund, in a manner and on terms as set forth as ANNEX D (hereinafter referred to as the "Bank Agreement"), and the Bank has agreed to so participate and receive such funding further to the terms of ANNEX D;

WHEREAS, the Participating UN Organizations have further agreed that each of the Recipient National Governments signing a Memorandum of Agreement (MOA) with the Administrative Agent attached hereto as ANNEX C will have access to the Fund under the result based payment modality and carry out programmatic activities in accordance with the MOA and assume responsibilities similar to those of the Participating UN Organizations signing the MOU;

WHEREAS, **[Name of Donor]** (hereinafter referred to as the "Donor") wishes to provide financial support to the Fund on the basis of the TOR as part of its development cooperation with the Host Government (if applicable) and wishes to do so through the Administrative Agent as proposed by the Participating UN Organizations; and

WHEREAS, this Standard Administrative Arrangement between the Donor and the Administrative Agent stipulates the terms and conditions of the financial support to the Fund, [and is not considered an international treaty and is not enforceable under international law];

NOW, THEREFORE, the Donor and the Administrative Agent (hereinafter referred to collectively as the "Participants") hereby decide as follows:

Section I
Disbursement of Funds to the Administrative Agent
and the Fund Account

1. [Subject to annual parliamentary appropriation], the Donor makes a contribution of [up to] **[amount in words] ([amount in figures])** and such further amounts (hereinafter referred to as the "Contribution") to support the Fund. The Contribution will enable the Participating UN Organizations to support the Fund in accordance

with the TOR, as may be amended from time to time. The Donor authorizes the Administrative Agent to use the Contribution for the purposes of the Fund and in accordance with this Standard Administrative Arrangement (hereinafter referred to as "Arrangement"). The Donor acknowledges that the Contribution will be co-mingled with other contributions to the Fund Account and that it will not be separately identified or administered.

2. The Donor will deposit the Contribution by wire transfer, in accordance with the schedule of payments set out in ANNEX B to this Arrangement, in convertible currencies of unrestricted use, to the following account:

For payment in USD:

Name of Account:	UNDP Multi-Partner Trust Fund Office (USD) Account
Account Number:	36349626
Name of Bank:	Citibank, N.A.
Address of Bank:	111 Wall Street New York, New York 10043
SWIFT Code:	CITIUS33
ABA:	021000089
Reference:	SOFF Account

3. When making a transfer to the Administrative Agent, the Donor will notify the Administrative Agent's Treasury Operations of the following: (a) the amount transferred, (b) the value date of the transfer; and (c) that the transfer is from **[name of Donor]** in respect of the Fund pursuant to this Arrangement. The Administrative Agent will promptly acknowledge receipt of funds in writing indicating the amount received in United States dollars and the date of receipt of the Contribution.
4. All financial accounts and statements related to the Contribution will be expressed in United States dollars.
5. The United States dollar value of a Contribution payment, if made in a currency other than United States dollars, will be determined by applying the United Nations operational rate of exchange in effect on the date of receipt of the Contribution. The Administrative Agent will not absorb gains or losses on currency exchanges. Such amounts will increase or decrease the funds available for disbursements to Participating UN Organizations.
6. The Fund Account will be administered by the Administrative Agent in accordance with the regulations, rules, policies and procedures applicable to it, including those relating to interest.
7. The Administrative Agent will be entitled to allocate an administrative fee of one percent (1%) of the Contribution by the Donor, to cover the Administrative Agent's costs of performing the Administrative Agent's functions.

8. The Steering Committee may request any of the Participating UN Organizations, to perform additional tasks in support of the Fund not related to the Administrative Agent functions detailed in Section I, paragraph 2 of the MoU and subject to the availability of funds. In this case, costs for such tasks will be decided in advance and with the approval of the Steering Committee be charged to the Fund as direct costs.
9. The Administrative Agent will be entitled to charge to the Fund Account a direct cost charge in an amount(s) consistent with then-current UNDG guidance to cover the cost of continuing to render Administrative Agent functions if and when the Steering Committee agrees to extend the Fund beyond the End Date with no further contribution(s) to the Fund.

Section II
Disbursement of Funds to the Participating UN Organizations
and a Separate Ledger Account

1. The Administrative Agent will make disbursements from the Fund Account in accordance with decisions from the Steering Committee, in line with the approved programmatic document
 . The disbursements to the Participating UN Organizations will consist of direct and indirect costs as set out in the Fund budget.
2. Each Participating UN Organization will establish a separate ledger account under its financial regulations and rules for the receipt and administration of the funds disbursed to it from the Fund Account. Each Participating UN Organization assumes full programmatic and financial accountability for the funds disbursed to them by the Administrative Agent. That separate ledger account will be administered by each Participating UN Organization in accordance with its own regulations, rules, policies and procedures, including those relating to interest.
3. Where the balance in the Fund Account on the date of a scheduled disbursement is insufficient to make that disbursement, the Administrative Agent will consult with the Steering Committee and make a disbursement, if any, in accordance with the Steering Committee's decisions.
4. The Donor reserves the right to discontinue future deposits of its Contribution further to Annex B if there is: (i) failure to fulfil any obligations under this Arrangement, including those related to Section IX; (ii) if there are substantial revisions of the TOR; or (iii) if there are credible allegations of improper use of the funds in accordance with Section VIII of this Arrangement; provided however that before doing so, the Administrative Agent, the Steering Committee and the Donor will consult with a view to promptly resolving the matter.

Section III

Activities of the Participating UN Organization

Implementation of the Fund

1. The implementation of the programmatic activities which the Donor assists in financing under this Arrangement will be the responsibility of the Participating UN Organizations and will be carried out by each Participating UN Organization in accordance with its own applicable regulations, rules, policies and procedures including those relating to procurement as well as the selection and assessment of implementing partners. Accordingly, personnel will be engaged and administered, equipment, supplies and services purchased, and contracts entered into in accordance with the provisions of such regulations, rules, policies and procedures. The Donor will not be responsible or liable for the activities of the Participating UN Organizations or the Administrative Agent as a result of this Arrangement.
2. The Participating UN Organizations will carry out the activities for which they are responsible in line with the budget contained in the approved programmatic document. Any modifications to the scope of the approved programmatic document, including as to its nature, content, sequencing or the duration thereof by the concerned Participating UN Organization(s), will be subject to the approval of the Steering Committee. The Participating UN Organization will promptly notify the Administrative Agent through the Steering Committee of any change in the budget as set out in the approved programmatic document.
3. Indirect costs of the Participating UN Organizations recovered through programme support costs will be seven percent (7%). All other costs incurred by each Participating UN Organization in carrying out the activities for which it is responsible under the Fund will be recovered as direct costs.
4. The Participating UN Organizations will commence and continue to conduct operations for the Fund activities only upon receipt of disbursements as instructed by the Steering Committee.
5. The Participating UN Organizations will not make any commitments above the budgeted amounts in the approved programmatic document.
6. If unforeseen expenditures arise, the Steering Committee will submit, through the Administrative Agent, a supplementary budget to the Donor showing the further financing that will be necessary. If no such further financing is available, the activities to be carried out under the approved programmatic document may be reduced or, if necessary, terminated by the Participating UN Organizations.
7. As an exceptional measure, particularly during the start-up phase of the Fund, subject to conformity with their financial regulations, rules and policies, Participating UN Organizations may elect to start implementation of Fund activities in advance of receipt of initial or subsequent transfers from the Fund Account by using their

own resources. Such advance activities will be undertaken in agreement with the Steering Committee on the basis of funds it has allocated or approved for implementation by the particular Participating UN Organization following receipt by the Administrative Agent of signed Administrative Arrangements from donors contributing to the Fund. Participating UN Organizations will be solely responsible for decisions to initiate such advance activities or other activities outside the parameters set forth above.

8. Each Participating UN Organization will establish appropriate programmatic safeguard measures in the design and implementation of its Fund activities, thereby promoting the shared values, norms and standards of the United Nations system. These measures may include, as applicable, the respect of international conventions on the environment, on children's rights, and internationally agreed core labour standards.

Special Provisions regarding Financing of Terrorism

9. Consistent with UN Security Council Resolutions relating to terrorism, including UN Security Council Resolution 1373 (2001) and 1267 (1999) and related resolutions, the Participants are firmly committed to the international fight against terrorism, and in particular, against the financing of terrorism. Similarly, the Participants and the Participating UN Organizations recognize their obligation to comply with any applicable sanctions imposed by the UN Security Council. Each of the Participating UN Organizations will use all reasonable efforts to ensure that the funds transferred to it in accordance with the MoU are not used to provide support or assistance to individuals or entities associated with terrorism as designated by any UN Security Council sanctions regime. If, during the term of this Arrangement, a Participating UN Organization determines there are credible allegations that funds transferred to it in accordance with this Arrangement have been used to provide support or assistance to individuals or entities associated with terrorism as designated by any UN Security Council sanctions regime, it will as soon as it becomes aware of it inform the Steering Committee, the Administrative Agent and the Donor and, in consultation with the donors as appropriate, determine an appropriate response.

Section IV **Equipment and Supplies**

Ownership of equipment and supplies procured, and intellectual property rights associated with works produced, using funds transferred to the Participating UN Organization under the MoU, will be determined in accordance with the regulations, rules, policies and procedures applicable to such Participating UN Organization, including any agreement with the relevant Host Government, if applicable.

Section V **Reporting**

1. The Administrative Agent will provide the Donor and the Steering Committee with the following statements and reports, based on submissions provided to the Administrative Agent by each Participating UN Organization prepared in accordance with the accounting and reporting procedures applicable to it, as set forth in the TOR:
 - (a) Annual consolidated narrative progress reports, to be provided no later than five months (31 May) after the end of the calendar year;
 - (b) Annual consolidated financial reports, as of 31 December with respect to the funds disbursed from the Fund Account, to be provided no later than five months (31 May) after the end of the calendar year;
 - (c) Final consolidated narrative report, after the completion of the activities in the approved programmatic document, including the final year of the activities in the approved programmatic document, to be provided no later than six months (30 June) after the end of the calendar year in which the operational closure of the Fund occurs;
 - (d) Final consolidated financial report, based on certified final financial statements and final financial reports received from Participating UN Organizations after the completion of the activities in the approved programmatic document, including the final year of the activities in the approved programmatic document, to be provided no later than five months (31 May) after the end of the calendar year in which the financial closing of the Fund occurs.
2. Annual and final reporting will be results-oriented and evidence based. Annual and final narrative reports will compare actual results with expected results at the output and outcome level, and explain the reasons for over or underachievement. The final narrative report will also contain an analysis of how the outputs and outcomes have contributed to the overall impact of the Fund. The financial reports will provide information on the use of financial resources against the outputs and outcomes in the agreed upon results framework.
3. The Administrative Agent will provide the Donor, Steering Committee and Participating UN Organizations with the following reports on its activities as Administrative Agent:
 - (a) Certified annual financial statement ("Source and Use of Funds" as defined by UNDG guidelines) to be provided no later than five months (31 May) after the end of the calendar year; and

- (b) Certified final financial statement ("Source and Use of Funds") to be provided no later than five months (31 May) after the end of the calendar year in which the financial closing of the Fund occurs.
4. Consolidated reports and related documents will be posted on the websites of the Fund and the Administrative Agent [<http://mptf.undp.org>].

Section VI

Monitoring and Evaluation

Monitoring

1. Monitoring of the Fund will be undertaken in accordance with the TOR. The Donor, the Administrative Agent and the Participating UN Organizations will hold consultations at least annually, as appropriate, to review the status of the Fund. In addition, the Donor, the Administrative Agent and the Participating UN Organizations will discuss any substantive revisions to the Fund, and promptly inform each other about any significant circumstances and major risks, including those related to Section IX, which interfere or threaten to interfere with the successful achievement of the outcomes outlined in the TOR, financed in full or in part through the Contribution.

Evaluation

2. Evaluation of the Fund including, as necessary and appropriate, joint evaluation by the Participating UN Organizations, the Administrative Agent, the Donor, the Host Government (if applicable) and other partners will be undertaken in accordance with the TOR.
3. The Steering Committee and/or Participating UN Organizations will recommend a joint evaluation if there is a need for a broad assessment of results at the level of the Fund or at the level of an outcome within the Fund. The joint evaluation report will be posted on the website of the Fund and the Administrative Agent [<http://mptf.undp.org>].
4. In addition, the Donor may, separately or jointly with other partners, take the initiative to evaluate or review its cooperation with the Administrative Agent and the Participating UN Organizations under this Arrangement, with a view to determining whether results are being or have been achieved and whether contributions have been used for their intended purposes. The Administrative Agent and the Participating UN Organizations will be informed about such initiatives, will be consulted on the scope and conduct of such evaluations or reviews and will be invited to join. Participating UN Organizations will upon request assist in providing relevant information within the limits of their regulations, rules, policies and procedures.

All costs will be borne by the respective Donor, unless otherwise agreed. It is understood by the Participants that such evaluation or review will not constitute a financial, compliance or other audit of the Fund including any programmes, projects or activities funded under this Arrangement.

Section VII Audit

External and Internal Audit

1. The activities of the Administrative Agent and each Participating UN Organization in relation to the Fund will be exclusively audited by their respective internal and external auditors in accordance with their own financial regulations and rules. The corresponding external and internal audit reports will be disclosed publicly unless the relevant policies and procedures of the Administrative Agent or each Participating UN Organization provide otherwise

Joint Internal Audits

2. The Internal Audit Services of the UN organizations involved in the Fund may consider conducting joint internal audits thereof in accordance with the Framework for Joint Internal Audits of UN Joint Activities, including its risk-based approach and provisions for disclosure of internal audit reports related to the Fund. In doing so, the Internal Audit Services of the Administrative Agent and the Participating UN Organizations will consult with the Steering Committee

Cost of Internal Audits

3. The total costs of internal audit activities in relation to the Fund will be borne by the Fund.

Audits of Implementing Partners

4. The part of the Contribution transferred by a Participating UN Organization to its implementing partners for activities towards the implementation of the Fund will be audited as provided under that Participating UN Organization's financial regulations and rules, as well as its policies and procedures. The disclosure of the corresponding audit reports will be made according to the policies and procedures of that Participating UN Organization.

Section VIII

Fraud, Corruption and Unethical Behaviour

1. The Participants are firmly committed to take all necessary precautions to avoid and address corrupt, fraudulent, collusive, coercive, unethical, or obstructive practices. The Administrative Agent and the Participating UN Organizations recognize that

it is important that all United Nations staff, individual contractors, implementing partners, vendors and any third parties which are involved either in joint activities or in those of the Administrative Agent or Participating UN Organization (such individuals and entities being hereinafter referred to, together as the “Individuals/Entities”, and individually as the “Individual/Entity”) must adhere to the highest standard of integrity as defined by each relevant UN organization. To this end, the Administrative Agent and each Participating UN Organization will maintain standards of conduct that govern the performance of the Individuals/Entities, to prohibit practices which are contrary to this highest standard in any activity related to the Fund/Programme. If an Individual/Entity is a UN organization, the Participating UN Organization engaging that Individual/Entity will rely upon that Individual’s/Entity’s standard of integrity. The Individuals/Entities must not engage in corrupt, fraudulent, collusive, coercive, unethical, or obstructive practices, as defined below.

2. In this Arrangement,

- (a) “Corrupt practice” means the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another individual or entity;
- (b) “Fraudulent practice” means any act or omission, including misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, an individual or an entity to obtain a financial or other benefit, or to avoid an obligation;
- (c) “Collusive practice” means an arrangement between two or more individuals and/or entities designed to achieve an improper purpose, including influencing improperly the actions of another individual or entity;
- (d) “Coercive practice” means impairing or harming, or threatening to impair or harm, directly or indirectly, any individual or entity or the property of the individual or entity to influence improperly the actions of an individual or entity;
- (e) “Unethical practice” means the conduct of behavior that is contrary to staff or supplier codes of conduct such as those relating to conflict of interest, gifts and hospitality, and post-employment provisions; and
- (f) “Obstructive practice” means acts or omissions intended to materially impede the exercise of contractual rights of audit, investigation and access to information, including destruction, falsification, alteration or concealment of evidence material to an investigation into allegations of fraud and corruption.

Investigations

- 3. (a) Investigations of allegations of wrongdoing by Individuals/Entities involved in the Fund which are contracted by the Administrative Agent or a Participating UN Organization will be carried out by the Investigation Service of the UN organization with which the potential subject of investigation is contracted (Administrative Agent or Participating UN Organization), in accordance with that UN organization’s internal policies and procedures.
- (b)
 - (i) In the event that the Investigation Service of the Administrative Agent determines that an allegation in relation to the implementation of the activities for which

the Administrative Agent is accountable is credible enough to warrant an investigation, the Administrative Agent will promptly notify the Steering Committee to the extent that such notification does not jeopardize the conduct of the investigation, including but not limited to the prospects of recovery of funds or the safety or security of persons or assets.

(ii) In the event that the Investigation Service of a Participating UN Organization determines that an allegation in relation to the implementation of the activities for which that Participating UN Organization is accountable is credible enough to warrant an investigation, it will promptly notify the Steering Committee and the Administrative Agent of the Fund, to the extent that such notification does not jeopardize the conduct of the investigation, including but not limited to the prospects of recovery of funds or the safety or security of persons or assets.

(iii) In the case of such notification, it is the responsibility of the Steering Committee and the Administrative Agent to communicate promptly with the relevant anti-fraud offices (or equivalent) of the Donor.

(iv) In case of a credible allegation, the relevant UN organization(s) will take timely and appropriate action in accordance with its regulations, rules, policies and procedures, which may include withholding further disbursements to the Individual(s)/ Entity(ies) allegedly involved in the corrupt, fraudulent, collusive, coercive, unethical or obstructive practices as defined above.

(c)

(i) The UN organization's Investigation Service reviewing the credibility of an allegation or conducting the investigation will share information as appropriate with counterpart Investigation Services of the other UN organizations involved in the Fund (Administrative Agent or Participating UN Organization) to determine the best path towards resolution of the investigation and whether the alleged wrongdoing is limited to such UN organization or whether one or more other UN organizations involved in the Fund (Administrative Agent or one or more Participating UN Organizations) may also be affected. If the relevant Investigation Services determine that more than one UN organization could be affected by the alleged wrongdoing, they will follow the procedure described below in clause (ii).

(ii) Where a potential subject of an investigation is contracted by more than one UN organization involved in the Fund, the Investigation Services of the UN organizations concerned (Administrative Agent or Participating UN Organization) may consider conducting joint or coordinated investigations, determining which investigation framework to use.

(d) Upon completion of the internal reporting on their investigation by the Participating UN Organization(s) concerned as established in their respective internal policies and procedures, the Participating UN Organization(s) will provide information on the results of their investigation(s) to the Administrative Agent and the Steering Committee. In the case of the Administrative Agent, upon completion of its internal reporting, it will provide the information on the results of its investigation to the Steering Committee. Following such receipt of information on the results of the investigation(s), it is the responsibility of the Steering Committee and the Administrative Agent to communicate promptly with the relevant anti-fraud offices (or equivalent) of the Donor.

(e) Each UN organization(s) concerned (Administrative Agent or Participating UN Organization) will determine what disciplinary and/or administrative measures, in-

cluding referral to national authorities, may be taken as a result of the investigation, according to its internal policies and procedures on disciplinary and/or administrative measures, including vendor sanction mechanism, as appropriate. The Participating UN Organization(s) concerned will share information on measures taken as a result of the investigation(s) with the Administrative Agent and the Steering Committee of the Fund. The Administrative Agent will share information on measures taken as a result of its own investigation with the Steering Committee. Following such receipt of information on measures taken as a result of the investigation(s), it is the responsibility of the Steering Committee and the Administrative Agent to communicate promptly with the relevant anti-fraud offices (or equivalent) of the Donor.

Recovery of Funds

4. If there is evidence of improper use of funds as determined after an investigation, the UN organization(s) concerned (Administrative Agent or Participating UN Organization) will use their best efforts, consistent with their respective regulations, rules, policies and procedures to recover any funds misused. With respect to any funds recovered, the Participating UN Organization will consult with the Steering Committee, the Administrative Agent and the Donor. The Donor may request that such funds be returned to it in proportion to its Contribution to the Fund, in which case the Participating UN Organization would credit that portion of the funds so recovered to the Fund Account and the Administrative Agent would return that portion of such funds to the Donor in accordance with Section XI, paragraph 6. For any such funds the Donor does not request to be returned to it, such funds will either be credited to the Fund Account or used by the Participating UN Organization for a purpose mutually agreed upon.
5. The Administrative Agent and the Participating UN Organizations will apply the provisions of Section VIII, paragraphs 1 to 4 above in accordance with their respective accountability and oversight framework as well as relevant regulations, rules, policies and procedures.

Section IX

Sexual Exploitation and/or Sexual Abuse, and/or Sexual Harassment

1. The Participants have zero tolerance for and are firmly committed to take all necessary measures to prevent and address instances of sexual exploitation and sexual abuse in programming activities, and sexual harassment. The Administrative Agent and the Participating UN Organizations recognize that it is important that all United Nations staff, individual contractors, implementing partners, vendors and any third parties which are involved either in joint activities or in those of the Administrative Agent or Participating UN Organization (such individuals and entities being hereinafter referred to, together as the "Individuals/Entities", and individually as the "Individual/Entity") will adhere to the highest standards of integrity and conduct as defined by each relevant UN organization. The Individuals/Entities will not engage in Sexual Exploitation, Sexual Abuse and Sexual Harassment, as defined below.

2. Definitions:

- (a) "Sexual Exploitation" means any actual or attempted abuse of a position of vulnerability, differential power, or trust, for sexual purposes, including but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another;
- (a) "Sexual Abuse" means the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions; and
- (b) "Sexual Harassment" means any unwelcome conduct of a sexual nature, that might reasonably be expected or be perceived to cause offense or humiliation, when such conduct interferes with work, is made a condition of employment or creates an intimidating, hostile or offensive work environment. Sexual harassment may occur in the workplace or in connection with work. While typically involving a pattern of conduct, sexual harassment may take the form of a single incident. In assessing the reasonableness of expectations or perceptions, the perspective of the person who is the target of the conduct shall be considered.

3. Investigation and reporting:

(a) Investigation:

- (a) Investigations of allegations of Sexual Exploitation and/or Sexual Abuse arising in programmatic activities funded by the Fund, will, where appropriate, be carried out by the Investigation Service of the relevant Participating UN Organization in accordance with its rules, regulations, policies and procedures. Where the implementing partner of that funded activity and its responsible parties, sub-recipients and other entities engaged to provide services in relation to programmatic activities are UN Organizations, investigations of such allegations will be carried out by the Investigation Service of the relevant UN Organization in accordance with their rules, regulations, policies and procedures. In cases where the relevant Participating UN Organization is not conducting the investigation itself, the relevant Participating UN Organization will require that the implementing partner of that funded activity and its responsible parties, sub-recipients and other entities engaged to provide services in relation to programmatic activities, investigate allegations of Sexual Exploitation and Sexual Abuse credible enough to warrant an investigation.
 - (ii) Where a potential subject of an investigation is contracted by more than one UN Organization involved in the Fund, the Investigation Services of the UN Organizations concerned (Administrative Agent or Participating UN Organization) may consider conducting joint or coordinated investigations, determining which investigation framework to use.
- (iii) Investigations of allegations of Sexual Harassment by UN staff and personnel involved in the Fund and contracted by the Administrative Agent and/or each Participating UN Organisation will be carried out by the Investigation Service of the relevant UN Organization in accordance with its rules, regulations, policies and procedures.
- (a) Reporting on allegations investigated by PUNOs and their implementing partners
 - (i) The Steering Committee, the Administrative Agent of the Fund and the Donors will be promptly notified of allegations of Sexual Exploitation and/or Sexual

- Abuse received/under investigation by the Participating UN Organization, as well as of any allegations credible enough to warrant an investigation received from the Participating UN Organization's implementing partners, through the Secretary-General's reporting mechanism on Sexual Exploitation and Sexual Abuse (the "Report"), without prejudice to the status of the Participating UN Organisation.
- (i) The Participating UN Organizations that do not participate in the Report will promptly notify the Steering Committee, the Administrative Agent of the Fund and the Donors of allegations of Sexual Exploitation and/or Sexual Abuse received/under investigation by any such Participating UN Organization through their normal method of reporting of such matters to their relevant governing bodies.
- (c) Reporting on credible allegations and measures taken following an investigation:
- (i) The Steering Committee, the Administrative Agent of the Fund and the Donors will be promptly notified of credible allegations of Sexual Exploitation and/or Sexual Abuse investigated by the Participating UN Organization, as well as of any credible allegations that have been investigated by and received from the Participating UN Organization's implementing partners, through the Report.
- (ii) In those cases where the respective Participating UN Organization determined that a case would have significant impact on a Participating UN Organisation's partnership with the Fund and/or with the Donor(s), the Participating UN Organization(s) will promptly provide information containing the level of detail as found in the Report, on the results of their investigation(s) or the investigations conducted by its implementing partners that they are aware of, with respect to the cases in the Report relating to the activities funded by the Fund, which resulted in a finding of Sexual Exploitation and/or Sexual Abuse, to the Administrative Agent and the Steering Committee Chair. Following such receipt of information on the results of the investigation(s), it is the responsibility of the Administrative Agent to communicate promptly with the relevant integrity / investigation offices (or equivalent) of the Donor.
- (iii) Following a determination of a credible allegation of Sexual Exploitation and/or Sexual Abuse, each Participating UN Organization will determine what contractual, disciplinary and/or administrative measures, including referral to national authorities, may be taken as a result of an investigation, according to its internal regulations, rules, policies and procedures on disciplinary and/or administrative measures, as appropriate. The Participating UN Organization(s) concerned will share information on measures taken as a result of the credible allegation of Sexual Exploitation and/or Sexual Abuse in its programmatic activities financed by the Fund with the Administrative Agent and the Steering Committee through the Report.
- (iv) With respect to credible allegations of Sexual Harassment (regarding Participating UN Organization's internal activities) the relevant Participating UN Organization will share information on measures taken with the Administrative Agent, the Steering Committee and the Donors of the Fund through their regular reporting to their relevant governing bodies. The Administrative Agent will share information on measures taken as a result of its own investigation which resulted in a finding of credible allegation of Sexual Harassment regarding its internal activities, with the Steering Committee and the Donors of the Fund through its regular reporting to its relevant governing body.

4. Any information provided by Participating UN Organizations in accordance with the foregoing paragraphs, will be shared in accordance with their respective regulations, rules, policies and procedures and without prejudice to the safety, security, privacy and due process rights of concerned individuals.

Section X **Communication and Transparency**

1. Subject to the regulations, rules, policies and procedures of the Participating UN Organization, information given to the press, to the beneficiaries of the Fund, all related publicity material, official notices, reports and publications, will highlight the results achieved and acknowledge the role of the Host Government, the Donor, the Participating UN Organizations, the Administrative Agent and any other relevant entities.
2. The Administrative Agent in consultation with the Participating UN Organizations will ensure that decisions regarding the review and approval of the Fund as well as periodic reports on the progress of implementation of the Fund are posted, where appropriate, for public information on the websites of the Fund and the Administrative Agent [<http://mptf.undp.org>]. Such reports and documents may include Steering Committee approved programmes and programmes awaiting approval, fund level annual financial and progress reports and external evaluations, as appropriate.
3. The Donor, the Administrative Agent and the Participating UN Organizations are committed to principles of transparency with regard to the implementation of the Fund, consistent with their respective regulations, rules, policies and procedures. The Donor, the Administrative Agent, Participating UN Organizations and the Host Government, if applicable, will endeavor to consult prior to publication or release of any information regarded as sensitive.

Section XI **Expiration, Modification, Termination and Unspent Balances**

1. The Administrative Agent will notify the Donor when it has received notice from all Participating UN Organizations that the activities for which they are responsible under the approved programmatic document have been completed and the Fund is operationally closed.
2. This Arrangement may be modified only by written agreement between the Participants.
3. This Arrangement may be terminated by either Participant on thirty (30) days written notice to the other Participant, subject to the continuance in force of paragraph 4 below for the purpose therein stated.

4. Notwithstanding the termination of this Arrangement, the amount of the Contribution transferred to the Administrative Agent up to and including the date of termination of this Arrangement will continue to be used to support the Fund until completion of the Fund, at which point, any remaining balances will be dealt with according to paragraph 5 below.
5. Any balance remaining in the Fund Account upon completion of the Fund will be used for a purpose mutually agreed upon or returned to the Donor in proportion to its contribution to the Fund as decided upon by the Donor and the Steering Committee.
6. When returning funds to the Donor in accordance with paragraph 5 above or Section VIII, paragraph 4, the Administrative Agent will notify the Donor of the following: (a) the amount transferred, (b) the value date of the transfer, and (c) that the transfer is from the Multi-Partner Trust Fund Office in respect of the Fund in pursuant to this Arrangement. The Donor will promptly acknowledge receipt of funds in writing.
7. This Arrangement will expire upon the delivery to the Donor of the certified final financial statement pursuant to Section V, paragraph 3(b).

Section XII **Notices**

1. Any action required or permitted to be taken under this Arrangement may be taken on behalf of the Donor, by _____ or his or her designated representative, and on behalf of the Administrative Agent, by the Executive Coordinator of the Multi-Partner Trust Fund Office or his or her designated representative.
2. Any notice or request required or permitted to be given or made in this Arrangement will be in writing. Such notice or request will be deemed to be duly given or made when it will have been delivered by hand, mail, or any other agreed means of communication to the Participant to which it is required to be given or made, at such Participant's address specified below or at such other address as the Participant will have specified in writing to the Participant giving such notice or making such request.

For the Donor [all issues except those related to fraud and investigation]:

Name (optional): _____

Title: _____

Address: _____

Telephone: _____

Facsimile: _____

Electronic mail: _____

For the Donor [all issues related to fraud and investigation]

Name (optional): _____

Title: _____

Address: _____

Telephone: _____

Facsimile: _____

Electronic mail: _____

For the Donor [all issues related to SEA and SH]:

Name (optional): _____

Title: _____

Address: _____

Telephone: _____

Facsimile: _____

Electronic mail: _____

For the Administrative Agent:

Title: Executive Coordinator, MPTF Office, UNDP

Address: 304 East 45th Street, 11th Floor New York, NY 10017, USA

Telephone: +1 212 906 6880

Facsimile: +1 212 906 6990

Electronic mail: executivecoordinator.mptfo@undp.org

Section XIII **Entry into Effect**

This Arrangement will come into effect upon signature thereof by the Participants and will continue in effect until it expires or is terminated.

[If the Donor is a Government, use the following:]

Section XIV **Settlement of Disputes**

[Any dispute arising out of the Donor's Contribution to the Fund will be resolved amicably through dialogue among the Donor, the Administrative Agent and the concerned Participating UN Organization.]

[Section XV **Privileges and Immunities]**

[Nothing in this Standard Administrative Arrangement will be deemed a waiver,

express or implied, of any of the privileges and immunities of the United Nations, the Administrative Agent, or each Participating UN Organization.]

Any dispute arising out of the Donor's Contribution to the Fund/Programme will be resolved amicably through dialogue among the Donor, the Administrative Agent and the concerned Participating UN Organization.

[If the Donor is not a Government, use the following:]

**Section XIII
Settlement of disputes**

[1. Amicable settlement. The Participants will use their best efforts to settle amicably any dispute, controversy or claim arising out of, or relating to this Standard Administrative Arrangement or the breach, termination or invalidity thereof. Where the Participants wish to seek such an amicable settlement through conciliation, the conciliation will take place in accordance with the UNCITRAL Conciliation Rules then obtaining, or according to such other procedure as may be agreed between the Participants.]

[2. Arbitration. Any dispute, controversy or claim between the Participants arising out of this Standard Administrative Arrangement or the breach, termination or invalidity thereof, unless settled amicably under the preceding paragraph within sixty (60) days after receipt by one Participant of the other Participant's written request for such amicable settlement, will be referred by either Participant to arbitration before a single arbitrator in accordance with the UNCITRAL Arbitration Rules then obtaining. The arbitral tribunal will have no authority to award punitive damages. The Participants will be bound by any arbitration award rendered as a result of such arbitration as the final adjudication of any such controversy, claim or dispute.]

**Section XIV
Privileges and Immunities]**

[1. Nothing in this Standard Administrative Arrangement will be deemed a waiver, express or implied, of any of the privileges and immunities of the United Nations, the Administrative Agent, or each Participating UN Organization.]

IN WITNESS WHEREOF, the undersigned, being duly authorized by the respective Participants, have signed the present Arrangement in English in two copies.

For the Donor:

Signature: _____

Name: _____

Title: _____

Place: _____

Date: _____

For the Administrative Agent:

Signature: _____

Name: Jennifer Topping

Title: Executive Coordinator, MPTFO

Place: _____

Date: _____

ANNEX A: TOR

ANNEX B: Schedule of Payments

ANNEX C: Standard MOU between Participating UN Organisations and Administrative Agent

ANNEX D, E and F to be added.

ANNEX B SCHEDULE OF PAYMENTS

Schedule of Payments:

Amount:

[Time of first payment]

[amount in figures]

[Time of second payment]

[amount in figures]

[Time of third payment]

[amount in figures]

SAA Tracking Information (IATI or other)		
Administrative Agent	Administrative Agent IATI organisation identifier: Administrative Agent IATI activity identifier:	XI-IATI-UNPF MPTF00.....
Donor (option 1) or Donor (option 2)	Donor IATI organisation identifier: Donor IATI activity identifier (contract number): Donor agreement reference	_____ _____ _____

Annex 8. Draft Memorandum of Understanding between WMO, UNDP and UNEP for the creation of the SOFF

STANDARD MEMORANDUM OF UNDERSTANDING FOR SYSTEMATIC OBSERVATIONS FINANCING FACILITY USING PASS-THROUGH FUND MANAGEMENT⁶¹

DRAFT FOR SOFF UN MPTF

**Memorandum of Understanding
between
Participating UN Organizations⁶²,
and
the UNDP Multi-Partner Trust Fund Office
regarding the Operational Aspects of the
Systematic Observations Financing Facility**

WHEREAS, the World Meteorological Organization, the United Nation Environment Programme and the United Nations Development Programme signing this Memorandum of Understanding (hereinafter referred to collectively as the "Participating UN Organizations") have developed the Systematic Observations Financing Facility (hereinafter referred to as the "Fund") starting on [start date] and ending on [end date]⁶³ (hereinafter "End Date"), as may be amended from time to time, as more fully described in the Terms of Reference of the Multi-Donor Trust Fund dated [date], document no. [reference no. of document] (hereinafter referred to as the "TOR"), a copy of which is attached hereto as ANNEX A, and have agreed to establish a coordination mechanism (including a "Steering Committee", an Advisory Board and a Secretariat)⁶⁴ to facilitate the effective and efficient collaboration between the Participating UN Organizations for the implementation of the Fund;

WHEREAS, the Participating UN Organizations have agreed that they should adopt a coordinated approach to collaboration with donors who wish to support the implementation of the Fund and have developed a TOR to use as the basis for mobilising resources for the Fund, and have further agreed that they should offer donors the opportunity to contribute to the Fund and receive reports on the Fund through a single channel;

WHEREAS, the Participating UN Organizations have further agreed to ask the United Nations Development Programme (which is also a Participating UN Organization in connection with this Fund)⁶⁵ through the Multi-Partner Trust Fund Office to serve as the administrative interface between the donors and the Participating UN Organizations

and for these purposes the Multi-Partner Trust Fund Office has agreed to do so in accordance with this Memorandum of Understanding; and

WHEREAS, the Participating UN Organizations have agreed that the World Bank, through the International Bank for Reconstruction and Development and the International Development Association and any additional relevant Multi-Lateral Development Banks, (collectively, hereinafter referred to as the “Bank”), may participate in and receive funding from the Fund, in a manner and on terms as set forth as ANNEX X (hereinafter referred to as the “Bank Agreement”);

WHEREAS, the Participating UN Organizations have further agreed that Recipient National Governments signing the standard “Memorandum of Agreement” (MOA) with the Multi-Partner Trust Fund Office attached hereto as Bank Agreement will have access to the Fund under the result based payment modality, carry out programmatic activities in accordance with the MOA and assume responsibilities similar to those of the Participating UN Organizations signing this MOU;

NOW, THEREFORE, the Participating UN Organizations and the Multi-Partner Trust Fund Office (hereinafter referred to collectively as the “Participants”) hereby agree as follows:

Section I

Appointment of Administrative Agent; Status, Duties and Fee

1. The Participating UN Organizations hereby appoint the Multi-Partner Trust Fund Office (hereinafter referred to as the “Administrative Agent”) to serve as their Administrative Agent in connection with the Fund, in accordance with the terms and conditions set out in this Memorandum of Understanding. The Administrative Agent accepts this appointment on the understanding that the Participating UN Organizations assume full programmatic and financial accountability for the funds disbursed to them by the Administrative Agent. This appointment will continue until it expires, or is terminated, in accordance with Section X below.
2. The Administrative Agent will be accountable for effective and impartial fiduciary management and financial reporting, and on behalf of the Participating UN Organizations, the Administrative Agent will:
 - (a) Receive contributions from donors that wish to provide financial support to the Fund;
 - (b) Administer such funds received, in accordance with this Memorandum of Understanding and the Administrative Arrangement (as defined below in paragraph 4 of this Section) including the provisions relating to winding up the Fund Account and related matters;
 - (c) Subject to availability of funds, disburse such funds to each of the

Participating UN Organizations in accordance with decisions from the Steering Committee, taking into account the budget set out in the approved programmatic document⁶⁶.

- (d) Ensure consolidation of statements and reports, based on submissions provided by each Participating UN Organization, as set forth in the TOR, and provide these to each donor, that has contributed to the Fund and to the Steering Committee;
 - (d) Provide final reporting, including notification that the Fund has been operationally completed, in accordance with Section IV below;
 - (e) Disburse funds to any Participating UN Organization for any additional costs of the tasks that the Steering Committee may decide to allocate (as referred to in Section I, paragraph 3 below) in accordance with the TOR.
3. The Steering Committee may request any of the Participating UN Organizations, to perform additional tasks in support of the Fund not related to the Administrative Agent functions detailed in Section I, paragraph 2 above and subject to the availability of funds. Costs for such tasks will be agreed in advance and with the approval of the Steering Committee be charged to the Fund as direct costs.
 4. The Administrative Agent will enter into a Standard Administrative Arrangement, in the form attached hereto as ANNEX B (hereinafter referred to as an "Administrative Arrangement"), with each donor that wishes to provide financial support to the Fund. The Administrative Agent will ensure the posting of a copy of the template Administrative Arrangement, as well as information on donor contributions, on the website of the Administrative Agent (<http://mptf.undp.org>), as well as the website of the Fund, as appropriate.
 5. None of the Participating UN Organizations will be responsible for the acts or omissions of the Administrative Agent or its personnel, or of persons performing services on its behalf, except in regard to its respective contributory acts or omissions. With respect to contributory acts or omissions of the Participating UN Organizations, the resulting responsibility will be apportioned among them or any one of them to the extent of such contributory acts or omissions, or as may otherwise be agreed. In addition, donors will not be responsible or liable for the activities of the Participants as a result of this Memorandum of Understanding.
 6. The Administrative Agent will be entitled to allocate an administrative fee of one percent (1%) of the amount contributed by each donor signing an Administrative Arrangement, to meet the Administrative Agent's costs of performing the Administrative Agent's functions described in this Memorandum of Understanding.
 7. Where the Administrative Agent is also a Participating UN Organization, a clear delineation, including distinct reporting lines and an accountability framework, will be established and maintained within the organization designated as the Adminis-

trative Agent between its functions as an Administrative Agent and its functions as a Participating UN Organization.

8. The Administrative Agent will be entitled to charge to the Fund a direct cost charge in an amount(s) consistent with then-current UNDG guidance to cover the cost of continuing to render Administrative Agent functions if and when the Steering Committee agrees to extend the Fund beyond the End Date with no further contribution(s) to the Fund.

Section II **Financial Matters**

The Administrative Agent

1. The Administrative Agent will establish a separate ledger account under its financial regulations and rules for the receipt and administration of the funds received pursuant to the Administrative Arrangement (hereinafter referred to as the "Fund Account"). The Fund Account will be administered by the Administrative Agent in accordance with the regulations, rules, policies and procedures applicable to it, including those relating to interest.
2. The Administrative Agent will not absorb gains or losses on currency exchanges which will increase or decrease the funds available for disbursements to Participating UN Organizations.
3. Subject to the availability of funds, the Administrative Agent will make disbursements from the Fund Account in accordance with decisions from the Steering Committee, in line with the budget set forth in the approved programmatic document. The disbursements will consist of direct and indirect costs as set out in the budget.
4. The Administrative Agent will normally make each disbursement within five (5) business days after receipt of the relevant approved programmatic document, in accordance with the decisions received from the Steering Committee in line with the TOR, along with a copy of the relevant approved programmatic document, signed by all the parties concerned. The Administrative Agent will transfer funds to each Participating UN Organization through wire transfer. Each Participating UN Organization will advise the Administrative Agent in writing of the bank account for transfers pursuant to this Memorandum of Understanding. When making a transfer to a Participating UN Organization, the Administrative Agent will notify that Participating UN Organization's Treasury Operations of the following: (a) the amount transferred, (b) the value date of the transfer; and (c) that the transfer is from the Multi-Partner Trust Fund Office in respect of the Fund pursuant to this Memorandum of Understanding.
5. Where the balance in the Fund Account on the date of a scheduled disbursement is insufficient to make that disbursement, the Administrative Agent will consult with

the Steering Committee and make a disbursement, if any, in accordance with the Steering Committee's decisions.

The Participating UN Organizations

6. Each Participating UN Organization will establish a separate ledger account under its financial regulations and rules for the receipt and administration of the funds disbursed to it by the Administrative Agent from the Fund Account. That separate ledger account will be administered by each Participating UN Organization in accordance with its own regulations, rules, policies and procedures, including those relating to interest.
7. Each Participating UN Organization will use the funds disbursed to it by the Administrative Agent from the Fund Account to carry out the activities for which it is responsible as set out in the approved programmatic document, as well as for its indirect costs. The Participating UN Organizations will commence and continue to conduct operations for the Fund activities only upon receipt of disbursements made by the Administrative Agent in accordance with Section II, paragraph 3 above. The Participating UN Organizations will not make any commitments above the amount disbursed against the approved programmatic document. If there is a need to exceed the amount disbursed, the Participating UN Organization concerned will submit a supplementary budget request to the Steering Committee showing the further financing that will be necessary. If no such further financing is available, the activities to be carried out under the approved programmatic document may be reduced or, if necessary, terminated by the Participating UN Organization.
8. The Participating UN Organizations recognize that each of the donors signing an Administrative Arrangement has reserved the right to discontinue future deposits of its contribution if there is: (i) failure to fulfil any obligations under the Administrative Arrangement including those related to Section VIII; (ii) if there are substantial revisions of the TOR; or (iii) if there are credible allegations of improper use of the funds in accordance with Section VII of this Memorandum of Understanding (Section VIII of the Administrative Arrangement); provided however that before doing so, the Administrative Agent, the Steering Committee and the donor will consult with a view to promptly resolving the matter.
9. Indirect costs of the Participating UN Organizations recovered through programme support costs will be seven percent (7%). All other costs incurred by each Participating UN Organization in carrying out the activities for which it is responsible under the Fund will be recovered as direct costs.

Section III **Activities of the Participating UN Organizations**

Implementation of the Fund

1. The implementation of the programmatic activities will be the responsibility of the Participating UN Organizations and will be carried out by each Participating UN Organization in accordance with its own applicable regulations, rules, policies and procedures including those relating to procurement as well as the selection and assessment of implementing partners. Accordingly, personnel will be engaged and administered, equipment, supplies and services purchased, and contracts entered into in accordance with the provisions of such regulations, rules, policies and procedures.
2. Ownership of equipment and supplies procured, and intellectual property rights associated with works produced, using funds transferred to the Participating UN Organisations under this Memorandum of Understanding will be determined in accordance with the regulations, rules, policies and procedures applicable to such Participating UN Organizations, including any agreement with the relevant Host Government, if applicable.
3. Each Participating UN Organization will establish appropriate programmatic safeguard measures in the design and implementation of its Fund activities, thereby promoting the shared values, norms and standards of the United Nations system. These measures may include, as applicable, the respect of international conventions on the environment, on children's rights, and internationally agreed core labour standards.
4. As an exceptional measure, particularly during the start-up phase of the Fund, subject to conformity with their financial regulations, rules and policies, Participating UN Organizations may elect to start implementation of Fund activities in advance of receipt of initial or subsequent transfers from the Fund Account by using their own resources. Such advance activities will be undertaken in agreement with the Steering Committee on the basis of funds it has allocated or approved for implementation by the particular Participating UN Organization following receipt by the Administrative Agent of signed Administrative Arrangements from donors contributing to the Fund. Participating UN Organizations will be solely responsible for decisions to initiate such advance activities or other activities outside the parameters set forth above.
5. Any modifications to the scope of the approved programmatic document, including as to its nature, content, sequencing or the duration thereof by the Participating UN Organization(s), will be subject to the approval of the Steering Committee. The Participating UN Organization will promptly notify the Administrative Agent through the Steering Committee of any change in the budget as set out in the approved programmatic document.
6. Where a Participating UN Organization wishes to carry out its Fund activities through or in collaboration with a third party, it will be responsible for discharging all commitments and obligations with such third parties, and no other Participating UN Organization, nor the Administrative Agent, will be responsible for doing so.
7. In carrying out their programmatic activities, none of the Participating UN

Organizations will be considered as an agent of any of the others and, thus, the personnel of one will not be considered as staff members, personnel or agents of any of the others. Without restricting the generality of the preceding sentence, none of the Participating UN Organizations will be liable for the acts or omissions of the other Participating UN Organizations or their personnel, or of persons performing services on their behalf.

8. Each Participating UN Organization will ensure the Administrative Agent is advised in writing when all activities for which it is responsible under the approved programmatic document have been operationally completed. Financial closure must be completed within eighteen (18) months after operational closure or according to the time period specified in the financial regulations and rules of the Participating UN Organization, whichever one comes first.

Special Provisions regarding Financing of Terrorism

9. Consistent with UN Security Council Resolutions relating to terrorism, including UN Security Council Resolution 1373 (2001) and 1267 (1999) and related resolutions, the Participants are firmly committed to the international fight against terrorism, and in particular, against the financing of terrorism. Similarly, all Participants recognize their obligation to comply with any applicable sanctions imposed by the UN Security Council. Each of the Participating UN Organizations will use all reasonable efforts to ensure that the funds transferred to it in accordance with this Memorandum of Understanding are not used to provide support or assistance to individuals or entities associated with terrorism as designated by any UN Security Council sanctions regime. If, during the term of this Memorandum of Understanding, a Participating UN Organization determines that there are credible allegations that funds transferred to it in accordance with this Memorandum of Understanding have been used to provide support or assistance to individuals or entities associated with terrorism as designated by any UN Security Council sanctions regime it will as soon as it becomes aware of it inform the Steering Committee, the Administrative Agent and the donor(s) and, in consultation with the donors as appropriate, determine an appropriate response.

Section IV **Reporting**

Financial Reports

1. Each Participating UN Organization will provide the Administrative Agent with the following financial statements and reports prepared in accordance with the accounting and reporting procedures applicable to the Participating UN Organization concerned, as set forth in the TOR. The Participating UN Organizations will endeavour to harmonize their reporting formats to the extent possible.
 - (a) Annual financial report as of 31 December with respect to the funds disbursed to it from the Fund Account, to be provided no later than four (4) months (30

April) after the end of the calendar year; and

- (b) Certified final financial statements and final financial reports after the completion of the activities in the approved programmatic document, including the final year of the activities in the approved programmatic document, to be provided no later than five (5) months (31 May) after the end of the calendar year in which the financial closure of the activities in the approved programmatic document occurs, or according to the time period specified in the financial regulations and rules of the Participating UN Organization, whichever is earlier.

Narrative Reports

2. Each Participating UN Organization will provide the Administrative Agent and the Fund secretariat with the following narrative reports prepared in accordance with the reporting procedures applicable to the Participating UN Organization concerned, as set forth in the TOR. The Participating UN Organizations will endeavour to harmonize their reporting formats to the extent possible.
 - (a) Annual narrative progress reports, to be provided no later than three (3) months (31 March) after the end of the calendar year; and
 - (b) Final narrative reports, after the completion of the activities in the approved programmatic document, including the final year of the activities in the approved programmatic document, to be provided no later than four months (30 April) after the end of the calendar year in which the operational closure of the activities in the approved programmatic document occurs.
3. The Administrative Agent and the Fund Secretariat will ensure the preparation of consolidated narrative progress and financial reports, based on the reports provided in Section IV paragraphs 1 and 2 above, and will provide these consolidated reports to each donor that has contributed to the Fund, as well as the Steering Committee, in accordance with the timetable established in the Administrative Arrangement.
4. The annual and final reports will be results-oriented and evidence based. Annual and final narrative reports will compare actual results with expected results at the output and outcome level, and explain the reasons for over or underachievement. The final narrative report will also contain an analysis of how the outputs and outcomes have contributed to the overall impact of the Fund. The financial reports will provide information on the use of financial resources against the outputs and outcomes in the agreed results framework.
5. The Administrative Agent will also provide the donors, Steering Committee and Participating UN Organizations with the following reports on its activities as Administrative Agent:
 - a) Certified annual financial statement (“Source and Use of Funds” as defined

by UNDG guidelines) to be provided no later than five months (31 May) after the end of the calendar year; and

- b) Certified final financial statement (“Source and Use of Funds”) to be provided no later than five months (31 May) after the end of the calendar year in which the financial closing of the Fund occurs.
6. Consolidated reports and related documents will be posted on the websites of the Fund and the Administrative Agent [<http://mptf.undp.org>].

Section V

Monitoring and Evaluation

Monitoring

1. Monitoring of the Fund will be undertaken in accordance with the TOR. The Participants and the donor(s) will hold consultations at least annually, as appropriate, to review the status of the Fund. In addition, the Participants and the donor(s) will discuss any substantive revisions to the Fund, and promptly inform each other about any significant circumstances and major risks, including those related to Section VIII, which interfere or threaten to interfere with the successful achievement of the outcomes outlined in the TOR, financed in full or in part through contributions from the donor(s).

Evaluation

2. Evaluation of the Fund including, as necessary and appropriate, joint evaluation by the Participants, the donor(s), the Host Government (if applicable) and other partners will be undertaken in accordance with the TOR.
3. The Steering Committee and/or Participating UN Organizations will recommend a joint evaluation if there is a need for a broad assessment of results at the level of the Fund or at the level of an outcome within the Fund. The joint evaluation report will be posted on the website of the Fund and the Administrative Agent [<http://mptf.undp.org>].
4. In addition, the Participants recognize that the donor(s) may, separately or jointly with other partners, take the initiative to evaluate or review their cooperation with the Administrative Agent and the Participating UN Organizations under this Memorandum of Understanding, with a view to determining whether results are being or have been achieved and whether contributions have been used for their intended purposes. The Administrative Agent and the Participating UN Organizations will be informed about such initiatives, will be consulted on the scope and conduct of such evaluations or reviews and will be invited to join. The Participants will upon request assist in providing relevant information within the limits of their regulations, rules, policies and procedures. All costs will be borne by the respective donor, unless otherwise agreed. It is understood by the Participants that such evaluation or review

will not constitute a financial, compliance or other audit of the Fund including any programmes, projects or activities funded under this Memorandum of Understanding.

Section VI **Audit**

External and Internal Audit

1. The activities of the Administrative Agent and each Participating UN Organization in relation to the Fund will be exclusively audited by their respective internal and external auditors in accordance with their own financial regulations and rules. The corresponding external and internal audit reports will be disclosed publicly unless the relevant policies and procedures of each of the relevant Participants provide otherwise.

Joint Internal Audits

2. The Internal Audit Services of the Participants involved in the Fund may consider conducting joint internal audits thereof in accordance with the Framework for Joint Internal Audits of UN Joint Activities, including its risk-based approach and provisions for disclosure of internal audit reports related to the Fund. In doing so, the Internal Audit Services of the Participants will consult with the Steering Committee.

Cost of Internal Audits

3. The total costs of internal audit activities in relation to the Fund will be borne by the Fund.

Audits of Implementing Partners

4. The part of the contribution transferred by a Participating UN Organization to its implementing partners for activities towards the implementation of the Fund will be audited as provided under that Participating UN Organization's financial regulations and rules, as well as its policies and procedures. The disclosure of the corresponding audit reports will be made according to the policies and procedures of that Participating UN Organization.

Section VII **Fraud, Corruption and Unethical Behaviour**

1. The Participants are firmly committed to take all necessary precautions to avoid and address corrupt, fraudulent, collusive, coercive, unethical, or obstructive practices. The Participants recognize that it is important that all United Nations staff, individual contractors, implementing partners, vendors and any third parties which are

involved either in joint activities or in those of the Administrative Agent or Participating UN Organization (such individuals and entities being hereinafter referred to, together, as the "Individuals/Entities", and individually as the "Individual/Entity") must adhere to the highest standard of integrity as defined by each Participant. To this end, each Participant will maintain standards of conduct that govern the performance of the Individuals/Entities, to prohibit practices which are contrary to this highest standard in any activity related to the Fund. If an Individual/Entity is a UN organization, the Participating UN Organization engaging that Individual/Entity will rely upon that Individual's/Entity's standard of integrity. The Individuals/Entities must not engage in corrupt, fraudulent, collusive, coercive, unethical, or obstructive practices, as defined below.

2. In this Memorandum of Understanding,

- (g) "Corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another individual or entity;
- (h) "Fraudulent practice" means any act or omission, including misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, an individual or an entity to obtain a financial or other benefit, or to avoid an obligation;
- (i) "Collusive practice" means an arrangement between two or more individuals and/or entities designed to achieve an improper purpose, including influencing improperly the actions of another individual or entity;
- (j) "Coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any individual or entity or the property of the individual or entity to influence improperly the actions of an individual or entity;
- (k) "Unethical practice" means the conduct of behavior that is contrary to staff or supplier codes of conduct such as those relating to conflict of interest, gifts and hospitality, and post-employment provisions; and
- (l) "Obstructive practice" means acts or omissions intended to materially impede the exercise of contractual rights of audit, investigation and access to information, including destruction, falsification, alteration or concealment of evidence material to an investigation into allegations of fraud and corruption.

Investigations

- 3. (a) Investigations of allegations of wrongdoing by Individuals/Entities involved in the Fund which are contracted by a Participant will be carried out by the Investigation Service of the Participant with which the potential subject of investigation is contracted, in accordance with that Participant's internal policies and procedures.
- (b)
 - (i) In the event that the Investigation Service of a Participant determines that an allegation in relation to the implementation of activities for which that Participant is accountable is credible enough to warrant an investigation, it will promptly notify the Steering Committee (and the Administrative Agent, if such

Participant is not the Administrative Agent) of the Fund, to the extent that such notification does not jeopardize the conduct of the investigation, including but not limited to the prospects of recovery of funds or the safety or security of persons or assets.

(ii) In the case of such notification, it is the responsibility of the Steering Committee and the Administrative Agent to communicate promptly with the relevant anti-fraud offices (or equivalent) of the donor(s).

(iii) In case of a credible allegation, the relevant Participant(s) will take timely and appropriate action in accordance with its regulations, rules, policies and procedures, which may include withholding further disbursements to the Individual(s)/Entity(ies) allegedly involved in the corrupt, fraudulent, collusive, coercive, unethical or obstructive practices as defined above.

(c)

(i) The Participant's Investigation Service reviewing the credibility of an allegation or conducting the investigation will share information as appropriate with counterpart Investigation Services of the other Participants involved in the Fund to determine the best path towards resolution of the investigation and whether the alleged wrongdoing is limited to such Participant or whether one or more other Participants involved in the Fund may also be affected. If the relevant Investigation Services determine that more than one Participant could be affected by the alleged wrongdoing, they will follow the procedure described below in clause (ii).

(ii) Where a potential subject of an investigation is contracted by more than one Participant, the Investigation Services of the Participants concerned may consider conducting joint or coordinated investigations, determining which investigation framework to use.

(d) Upon completion of the internal reporting on their investigation by the Participant(s) concerned as established in their respective internal policies and procedures, the Participant(s) will provide information on the results of their investigation(s) to the Administrative Agent and the Steering Committee. Following such receipt of information on the results of the investigation(s), it is the responsibility of the Steering Committee and the Administrative Agent to communicate promptly with the relevant anti-fraud offices (or equivalent) of the donor(s).

(e) Each Participant concerned will determine what disciplinary and/or administrative measures, including referral to national authorities, may be taken as a result of the investigation, according to its internal policies and procedures on disciplinary and/or administrative measures, including vendor sanction mechanism, as appropriate. The Participant(s) concerned will share information on measures taken as a result of the investigation(s) with the Administrative Agent and the Steering Committee of the Fund. Following such receipt of information on measures taken as a result of the investigation(s), it is the responsibility of the Steering Committee and the Administrative Agent to communicate promptly with the relevant anti-fraud offices (or equivalent) of the donor(s).

4. If there is evidence of improper use of funds as determined after an investigation, each Participant concerned will use its best efforts, consistent with its regulations, rules, policies and procedures to recover any funds misused. With respect to any funds recovered, the relevant Participant will consult with the Steering Committee, the Administrative Agent and the donor(s). The donor(s) may request that such funds be returned to them in proportion to their contribution to the Fund, in which case the Participant would credit that portion of the funds so recovered to the Fund Account and the Administrative Agent would return that portion of such funds to the donor(s). For any such funds the donor(s) do not request to be returned to them, such funds will either be credited to the Fund Account or used by the Participant for a purpose mutually agreed upon.
5. The Participants will apply the provisions of Section VII, paragraphs 1 to 4 above in accordance with their respective accountability and oversight framework as well as relevant regulations, rules, policies and procedures.

Section VIII

Sexual Exploitation and/or Sexual Abuse, and/or Sexual Harassment

1. The Participants have zero tolerance for and are firmly committed to take all necessary measures to prevent and address instances of sexual exploitation and sexual abuse in programming activities, and sexual harassment. The Administrative Agent and the Participating UN Organizations recognize that it is important that all United Nations staff, individual contractors, implementing partners, vendors and any third parties which are involved either in joint activities or in those of the Administrative Agent or Participating UN Organization (such individuals and entities being hereinafter referred to, together as the "Individuals/Entities", and individually as the "Individual/Entity") will adhere to the highest standards of integrity and conduct as defined by each relevant UN organization. The Individuals/Entities will not engage in Sexual Exploitation, Sexual Abuse and Sexual Harassment, as defined below.
2. Definitions:
 - (c) "Sexual Exploitation" means any actual or attempted abuse of a position of vulnerability, differential power, or trust, for sexual purposes, including but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another;
 - (d) "Sexual Abuse" means the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions; and
 - (e) "Sexual Harassment" means any unwelcome conduct of a sexual nature, that might reasonably be expected or be perceived to cause offense or humiliation, when such conduct interferes with work, is made a condition of employment or creates an intimidating, hostile or offensive work environment. Sexual harassment may occur in the workplace or in connection with work. While typically involving a pattern of conduct, sexual harassment may take the form of a single incident. In assessing the reasonableness of expectations or perceptions, the perspective of the person who is the target of the conduct shall be considered.

3. Investigation and reporting:

(b) Investigation:

(i) Investigations of allegations of Sexual Exploitation and/or Sexual Abuse arising in programmatic activities funded by the Fund, will, where appropriate, be carried out by the Investigation Service of the relevant Participating UN Organization in accordance with its rules, regulations, policies and procedures. Where the implementing partner of that funded activity and its responsible parties, sub-recipients and other entities engaged to provide services in relation to programmatic activities are UN Organizations, investigations of such allegations will be carried out by the Investigation Service of the relevant UN Organization in accordance with their rules, regulations, policies and procedures. In cases where the relevant Participating UN Organization is not conducting the investigation itself, the relevant Participating UN Organization will require that the implementing partner of that funded activity and its responsible parties, sub-recipients and other entities engaged to provide services in relation to programmatic activities, investigate allegations of Sexual Exploitation and Sexual Abuse credible enough to warrant an investigation.

(ii) Where a potential subject of an investigation is contracted by more than one UN Organization involved in the Fund, the Investigation Services of the UN Organizations concerned (Administrative Agent or Participating UN Organization) may consider conducting joint or coordinated investigations, determining which investigation framework to use.

(iv) Investigations of allegations of Sexual Harassment by UN staff and personnel involved in the Fund and contracted by the Administrative Agent and/or each Participating UN Organisation will be carried out by the Investigation Service of the relevant UN Organization in accordance with its rules, regulations, policies and procedures.

(c) Reporting on allegations investigated by PUNOs and their implementing partners

(ii) The Steering Committee, the Administrative Agent of the Fund and the Donors will be promptly notified of allegations of Sexual Exploitation and/or Sexual Abuse received/under investigation by the Participating UN Organization, as well as of any allegations credible enough to warrant an investigation received from the Participating UN Organization's implementing partners, through the Secretary-General's reporting mechanism on Sexual Exploitation and Sexual Abuse (the "Report")⁶⁷, without prejudice to the status of the Participating UN Organisation.

(iii) The Participating UN Organizations that do not participate in the Report will promptly notify the Steering Committee, the Administrative Agent of the Fund and the Donors of allegations of Sexual Exploitation and/or Sexual Abuse received/under investigation by any such Participating UN Organization through their normal method of reporting of such matters to their relevant governing bodies.

(c) Reporting on credible allegations and measures taken following an investigation:

(i) The Steering Committee, the Administrative Agent of the Fund and the Donors will be promptly notified of credible allegations of Sexual Exploitation

and/or Sexual Abuse investigated by the Participating UN Organization, as well as of any credible allegations that have been investigated by and received from the Participating UN Organization's implementing partners, through the Report.

(ii) In those cases where the respective Participating UN Organization determined that a case would have significant impact on a Participating UN Organisation's partnership with the Fund and/or with the Donor(s), the Participating UN Organization(s) will promptly provide information containing the level of detail as found in the Report, on the results of their investigation(s) or the investigations conducted by its implementing partners that they are aware of, with respect to the cases in the Report relating to the activities funded by the Fund, which resulted in a finding of Sexual Exploitation and/or Sexual Abuse, to the Administrative Agent and the Steering Committee Chair. Following such receipt of information on the results of the investigation(s), it is the responsibility of the Administrative Agent to communicate promptly with the relevant integrity / investigation offices (or equivalent) of the Donor.

(iii) Following a determination of a credible allegation of Sexual Exploitation and/or Sexual Abuse, each Participating UN Organization will determine what contractual, disciplinary and/or administrative measures, including referral to national authorities, may be taken as a result of an investigation, according to its internal regulations, rules, policies and procedures on disciplinary and/or administrative measures, as appropriate. The Participating UN Organization(s) concerned will share information on measures taken as a result of the credible allegation of Sexual Exploitation and/or Sexual Abuse in its programmatic activities financed by the Fund with the Administrative Agent and the Steering Committee through the Report.

(iv) With respect to credible allegations of Sexual Harassment (regarding Participating UN Organization's internal activities) the relevant Participating UN Organization will share information on measures taken with the Administrative Agent, the Steering Committee and the Donors of the Fund through their regular reporting to their relevant governing bodies. The Administrative Agent will share information on measures taken as a result of its own investigation which resulted in a finding of credible allegation of Sexual Harassment regarding its internal activities, with the Steering Committee and the Donors of the Fund through its regular reporting to its relevant governing body.

1. Any information provided by Participating UN Organizations in accordance with the foregoing paragraphs, will be shared in accordance with their respective regulations, rules, policies and procedures and without prejudice to the safety, security, privacy and due process rights of concerned individuals.

Section IX

Communication and Transparency

1. Subject to the regulations, rules, policies and procedures of the Participating UN Organization, each Participating UN Organization will take appropriate measures to publicize the Fund and to give due credit to the other Participating UN Organizations. Information given to the press, to the beneficiaries of the Fund, all related

publicity material, official notices, reports and publications, will highlight the results achieved and acknowledge the role of the Host Government, the donors, the Participating UN Organizations, the Administrative Agent and any other relevant entities. In particular, the Administrative Agent will include and ensure due recognition of the role of each Participating UN Organization and national partner in all external communications relating to the Fund.

2. The Administrative Agent in consultation with the Participating UN Organizations will ensure that decisions regarding the review and approval of the Fund as well as periodic reports on the progress of implementation of the Fund are posted, where appropriate, for public information on the websites of the Fund and the Administrative Agent [<http://mptf.undp.org>]. Such reports and documents may include Steering Committee approved programmes and programmes awaiting approval, fund level annual financial and progress reports and external evaluations, as appropriate.
3. The Participants are committed to principles of transparency with regard to the implementation of the Fund, consistent with their respective regulations, rules, policies and procedures. The donors, the Administrative Agent, Participating UN Organization and the Host Government, if applicable, will endeavor to consult prior to publication or release of information regarded as sensitive.

Section X

Expiration, Modification, Termination and Unspent Balances

1. This Memorandum of Understanding will expire upon the delivery to the donor(s) of the certified final financial statement pursuant to Section IV, paragraph 5(b).
2. This Memorandum of Understanding may be modified only by written agreement between the Participants.
3. Any of the Participating UN Organizations may withdraw from this Memorandum of Understanding upon giving thirty (30) days' written notice to all other Participants to this Memorandum of Understanding subject to the continuance in force of paragraph 5 below for the purpose therein stated.
4. The Administrative Agent's appointment may be terminated by the Administrative Agent (on the one hand) or by the mutual agreement of all Participating UN Organizations (on the other hand) on thirty (30) days' written notice to the other Participants, subject to the continuance in force of paragraph 5 below for the purpose therein stated. In the event of such termination, the Participants will agree on measures to bring all activities to an orderly and prompt conclusion so as to minimize costs and expense.
5. Commitments assumed by the withdrawing or terminating Participants under this Memorandum of Understanding will survive the termination of this Memorandum of Understanding or the termination of the Administrative Agent or withdrawal of a Participating UN Organization to the extent necessary to permit the orderly

conclusion of the activities and the completion of final reports, the withdrawal of personnel, funds and property, the settlement of accounts between the Participants hereto and the settlement of contractual liabilities that are required in respect of any subcontractors, consultants or suppliers.

6. Any balance remaining in the individual Participating UN Organizations' separate ledger accounts after operational completion of the activities for which they are responsible under the approved programmatic document will be returned to the Fund Account as soon as administratively feasible and before financial closure of those activities in line with Section III, paragraph 8. Any balance remaining in the Fund Account upon completion of the Fund will be used for a purpose mutually agreed upon or returned to the donor(s) in proportion to their contribution to the Fund as decided upon by the donor(s) and the Steering Committee.

Section XI **Notices**

1. Any action required or permitted to be taken under this Memorandum of Understanding may be taken on behalf of the Administrative Agent by the Executive Coordinator of the Multi-Partner Trust Fund Office, or his or her designated representative, and on behalf of a Participating UN Organization by the head of office, or his or her designated representative.
2. Any notice or request required or permitted to be given or made in this Memorandum of Understanding will be in writing. Such notice or request will be deemed to be duly given or made when it will have been delivered by hand, mail or any other agreed means of communication to the Participant to which it is required to be given or made, at such Participant's address specified in ANNEX C to this Memorandum of Understanding or at such other address as the Participant will have specified in writing to the Participant giving such notice or making such request.

Section XII **Entry into Effect**

This Memorandum of Understanding will come into effect upon signature thereof by the Participants and will continue in effect until it expires or is terminated.

Section XIII **Settlement of Disputes**

The Participants will use their best efforts to promptly settle through direct negotiations any dispute, controversy or claim arising out of or in connection with this Memorandum of Understanding or any breach thereof. Any such dispute,

controversy or claim which is not settled within sixty (60) days from the date either Participant has notified the other Participant of the nature of the dispute, controversy or claim and of the measures which should be taken to rectify it, will be resolved through consultation between the Executive Heads of each of the Participants.

IN WITNESS WHEREOF, the undersigned, duly authorized representatives of the respective Participants, have signed this Memorandum of Understanding in English in **[number of signatories⁶⁸]** copies.

For the Administrative Agent

Signature: _____
 Name: Jennifer Topping
 Title: Executive Coordinator, Multi-Partner Trust Fund Office
 Place: _____
 Date: _____

For Participating UN Organization [name] *For Participating UN Organization [name]*

Signature: _____
 Name: _____
 Title: _____
 Place: _____
 Date: _____

Signature: _____
 Name: _____
 Title: _____
 Place: _____
 Date: _____

ANNEX A:

Terms of Reference (TOR)

ANNEX B:

Standard Administrative Arrangement between the Donor and the Administrative Agent

ANNEX XX:

To be added, World Bank Standard Administrative Agreement, and Standard MOA for Recipient National Government.

ANNEX C

Notices

For the Administrative Agent:

Name: Jennifer Topping
 Title: Executive Coordinator, MPTF Office

Address: 304 East 45th Street, 11th Floor, New York, NY 10017, USA

Telephone: +1 212 906 6880

Facsimile: +1 212 906 6990

Email: Jennifer.topping@undp.org

For Participating UN Organization [name]

Name: _____

Title: _____

Address: _____

Telephone: _____

Facsimile: _____

Electronic mail: _____

For Participating UN Organization [name]

Name: _____

Title: _____

Address: _____

Telephone: _____

Facsimile: _____

Electronic mail: _____



Endnotes

- 1 World Meteorological Organization (2021). State of the Global Climate 2020. WMO, Geneva. Available at: <https://public.wmo.int/en/our-mandate/climate/wmo-statement-state-of-global-climate>
- 2 World Bank. 2021. World Development Report 2021: Data for Better Lives. Washington, DC: World Bank. doi:10.1596/978-1-4648-1600-0. License: Creative Commons Attribution CC BY 3.0 IGO. Available at: <https://www.worldbank.org/en/publication/wdr2021>
- 3 Kull, Daniel Werner; Riishojgaard, Lars Peter; Eyre, John M.; Varley, Robert Andrew. 2021. The Value of Surface-based Meteorological Observation Data (English). Washington, D.C.: World Bank Group. Available at: <http://documents.worldbank.org/curated/en/192461614151036836/The-Value-of-Surface-based-Meteorological-Observation-Data>.
- 4 Ferdinand, T., E. Illick-Frank, L. Postema, J. Stephenson, et. al. 2021. "A Blueprint for Digital Climate-Informed Advisory Services: Building the Resilience of 300 Million Small-Scale Producers by 2030." Working Paper. Washington, DC: World Resources Institute. Available online at doi.org/10.46830/wriwp.20.00103.
- 5 The Alliance was launched at UNFCCC COP 25 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.
- 6 <https://alliancehydromet.org/systematic-observations-financing-facility/soff-support-statements/>
- 7 Kull, Daniel Werner; Riishojgaard, Lars Peter; Eyre, John M.; Varley, Robert Andrew. 2021. The Value of Surface-based Meteorological Observation Data (English). Washington, D.C.: World Bank Group. Available at: <http://documents.worldbank.org/curated/en/192461614151036836/The-Value-of-Surface-based-Meteorological-Observation-Data>
- 8 <https://community.wmo.int/gbon>
- 9 Until the WMO Reform, approved by the World Meteorological Congress in 2019, this was the Commission for Basic Systems and the Global Climate Observing System
- 10 The term "hydromet" refers to all investments related to strengthening weather observations and forecasting, early warning systems and climate information services.
- 11 SOFF Working Group on financing mechanism and opportunities: Analysis of Alliance Members Hydromet funding.
- 12 WMO Integrated Global Observing System (WIGOS) provides a framework for the integration and sharing of observational data from National Meteorological and Hydrological Services (NMHSs) and other sources.
- 13 Cases and lessons learned as documented and presented by countries at WIGOS workshops and reflected in projects evaluations.
- 14 The WDAQMS webtool is a resource developed and operated by WMO together with ECMWF to monitor the routine delivery of data into WMO's international data exchange system.
- 15 Independent Evaluation Group. World Bank Group, 2012. "Adapting to Climate Change: Assessing World Bank Group Experience--Phase III of the World Bank Group and Climate Change." Available at: <https://openknowledge.worldbank.org/handle/10986/21106>
- 16 Green Climate Fund, 2018. "Enhancing Climate Information and Knowledge Services for resilience in 5 island countries of the Pacific OceanCook" Available at: <https://www.greenclimate.fund/document/enhancing-climate-information-and-knowledge-services-resilience-5-island-countries-pacific>
- 17 See examples and references on the benefits of open data policies: (i) WMO Permanent Representative of Hungary presenting at the Data Conference how and why the country switched to an open data policy: <https://meetings.wmo.int/WMO-Data>

Conference/Documents/06_Konelia%20Radics_RK_WMODataConference.pdf; (ii) WMO Data Conference preparation workshop lists the benefits of the Copernicus open data policy and includes a reference to the underlying economic analysis: <https://meetings.wmo.int/WMO-Data-Conference/PublishingImages/SitePages/Preparatory%20Workshops/Copernicus%20Data%20Policy%20Benefits%20for%20Environmental%20Services.pdf>; (iii) Open data access approaches in the Group on Earth Observations and the research community: https://meetings.wmo.int/WMO-Data-Conference/PublishingImages/SitePages/Preparatory%20Workshops/Robert%20Chen_Open%20Data%20Access%20Approaches%20in%20GEO%20and%20the%20Research%20Community.pdf

18 WMO Unified Data Policy Resolution, available at: <https://public.wmo.int/en/unified-wmo-data-policy-resolution-cg-ext-21>

19 Under the Paris Agreement, the Global Stocktake is the review every five years of whether the net result of climate actions taken is consistent with the agreement goals. The first global stocktake will take place in 2023.

20 United Nations Environment Programme (2020). Emissions Gap Report 2020. Nairobi. Available at: <https://www.unep.org/emissions-gap-report-2020>

21 UNEP (2021). Adaptation Gap Report 2020

22 OECD (2020). Climate Finance Provided and Mobilised by Developed Countries in 2013-18

23 <https://www.worldbank.org/en/publication/wdr2021>, p. xi/xii and Spotlight 4.1

24 <https://gca.org/wp-content/uploads/2021/07/A-Blueprint-for-Digital-Climate-Informed-Advisory-Services.pdf>

25 See Alliance declaration at: https://ane4bf-datap1.s3-eu-west-1.amazonaws.com/wmocms/s3fs-public/ckeditor/files/Alliance_for_Hydromet_Development_Declaration.pdf?MK76pyj0R4sEbJb3c90y.W6S7km7PAEN

26 Alliance for Hydromet Development (2021). Hydromet Gap Report 2021. Available at: <https://alliancehydromet.org/gap-report/>

27 <https://alliancehydromet.org/systematic-observations-financing-facility/soff-support-statements/>

28 See the Crisis Lookout Solutions Paper at:

https://static1.squarespace.com/static/5c9d3c35ab1a62515124d7e9/t/607856e19abc3368d276132e/1618499302881/Crisis_lookout_14Aprilv4.pdf

29 UK COP26 Presidency. Priorities for public climate finance in the year ahead. 2021. <https://2nsbq1gn1rl23zol93eyrcj-wpengine.netdna-ssl.com/wp-content/uploads/2021/01/PRIORITIES-FOR-PUBLIC-CLIMATE-FINANCE-IN-THE-YEAR-AHEAD.pdf>

30 More information on REAP available at: <https://www.early-action-reap.org/who-we-are>

31 REAP Framework for Action available at: https://www.early-action-reap.org/sites/default/files/2021-01/20210125_REAP_Summary_NEW.pdf

32 Find SOFF First Funders' Forum report at: <https://public.wmo.int/en/our-mandate/how-we-do-it/development-partnerships/Innovating-finance/SOFF-funders-forum>

33 At its meeting on 11 September 2021, the MPTF Office Appraisal Committee reviewed the proposal to establish SOFF as a UN MPTF and cleared the establishment of the Fund. The Fund account will be set-up as soon as the MOU is signed (expected by end of October).

34 Examples of funds under UN MPTF Office trusteeship include the Partnership for Action on Green Economy, the UN Programme on Reducing Emissions from Deforestation and Forest Degradation, the Central Africa Forest Initiative, and the newly established Global Fund for Coral Reefs.

35 The Alliance membership is decided by Alliance Members on a case by case basis. The Alliance is open for membership to all public international development, humanitarian and financial institutions providing assistance to strengthening developing countries' hydromet capacity.

36 Resolution 74 (Cg-18) (2019). Closing the capacity gap: scaling up effective partnerships for investments in sustainable and cost-efficient infrastructure and service delivery. Available at: https://library.wmo.int/doc_num.php?explnum_id=9827

37 The initial concept of the CSI included five areas of support across all links of the meteorological value chain, these areas were (i) enabling environment and sustaining capacity; (ii) project and program development support; (iii) public private engagement; (iv) sustainable finance and (v) knowledge management. Under the adjusted scope, all these areas will be covered but exclusively for the SOFF related areas i.e. basics surface-based weather observations and the Country Hydromet Diagnostics which assesses 10 elements across the meteorological value chain.

38 https://www.fisu.net/medias/fichiers/dac_list_oda_recipients_for_reporting_2021_flows.pdf

39 In the case of OECD ODA eligible countries that do not have SIDS/LDC status, the SOFF Readiness support would be provided without involving Implementing Entities but in collaboration with international development and climate finance partners active in the country or planning to invest.

40 This amount was estimated based on the experience and lessons learned obtained from the road-testing of the Country Hydromet Diagnostics. The

Steering Committee could approve higher amounts., under exceptional circumstances for countries with especially difficult circumstances.

41 Draft GBON Regulatory Material in WMO Commission for Observation, Infrastructure and Information Systems, Recommendation 2. Available at: <https://meetings.wmo.int/INFCOM-1/English/Forms/AllItems.aspx?RootFolder=%2FINFCOM%2D1%2FEnglish%2F2%2E%20PROVISIONAL%20REPORT%20%28Approved%20documents%29&FolderC-TID=0x01200017BCAC15E9D18846906D60DDAA2-3289A&View=%7B0442DDE1%2D-38CE%2D49E5%2DABDF%2D94882DF645A2%7D>

42 The Country Hydromet Diagnostics road-testing countries were Afghanistan, Austria, Chad, China, Cote d'Ivoire, India, Kyrgyz Republic, Liberia, Maldives, Morocco, Myanmar, Nigeria, North Macedonia, Sierra Leone, Switzerland, Turkey.

43 The results of the CHD road-testing as well as the tool details can be found in the website for the Alliance for Hydromet Development <https://alliancehydromet.org/country-hydromet-diagnostics/>

44 Trust Fund Factsheet - Mali Stabilization Fund-FNSSE (undp.org)

45 <http://mptf.undp.org/factsheet/fund/EIF00>

46 GFDRR Gender Equality Site. Available at: <https://www.gfdr.org/en/genderequality>

47 See, for example, Inge Kaul, "Global Public Goods: A concept for framing the Post-2015 Agenda?" DIE Discussion Paper 2/2013. https://www.ingekaul.net/wp-content/uploads/2014/01/Internetfassung_DiscPaper_2_2013_Kaul1.pdf The author notes "the possibility of generating new, additional financial resources by introducing a 'globalization user fee' in the form of a modest levy on currency transactions." (p. 27)."

48 WMO Unified Data Policy Resolution, available at: <https://public.wmo.int/en/unified-wmo-data-policy-resolution>

49 SOFF resource requirements were initially estimated at USD 400 million for a period of five years and USD 50 million for sustained compliance beyond the first five years. Based on the shorter time horizon and revised programming targets, the resource mobilization requirement for SOFF First Implementation Stage is estimated to be USD 200 million. This target is based on the same basic assumptions as the original estimate of USD 400 million for five years. The revised phasing responds to potential funders' suggestions that SOFF embarks on an initial implementation/piloting/learning phase.

50 The regional classification is based on World Bank country classification accessed on February 22, 2021.

51 The countries presented in the list include: ODA recipient countries from the [DAC List of ODA](#)

[Recipients effective for reporting on 2021 flows](#); LDCs countries as per OECD DAC list; SIDS, as per [United Nations classification](#).

52 The General Assembly resolution A/73/L.40/Rev.1 adopted on 13 December 2018 decided that Bhutan will graduate five years after the adoption of the resolution, i.e. on 13 December 2023, and that São Tomé and Príncipe and Solomon Islands will graduate six years after the adoption of the resolution, i.e. on 13 December 2024.

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55 From 1 January 2022: Antigua and Barbuda, Palau and Panama will graduate from the DAC List of ODA Recipients.

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58 The initial concept of the CSI included five areas of support across all links of the meteorological value chain, these areas were (i) enabling environment and sustaining capacity; (ii) project and program development support; (iii) public private engagement; (iv) sustainable finance and (v) knowledge management. Under the adjusted scope, these areas will be covered but adjusted to SOFF requirements, i.e. with focus on basics surface-based weather observations and the Country Hydromet Diagnostics which assesses 10 elements across the meteorological value chain.

59 WMO's Quality Management guidance is relevant to all of these services, including observations. In some cases, quality management is required by some clients, such as ICAO (which provides for the cost-recovery of relevant products for aviation from the user community, thereby enabling sustainable funding of many services). Alliance partners all have risk frameworks and varying risk appetites, which must be considered in SOFF implementation

60 World Bank 2019, *The Power of Partnership Public and Private Engagement in Hydromet Services*

61 This Standard Memorandum of Understanding has been agreed upon by the members of the United Nations Sustainable Development Group (UNSDG). Any substantial ('substantial' would imply changes that are linked to the legal relationships described in the Memorandum of Understanding, the governance mechanisms, reporting arrangements or equivalent) modification to the Memorandum of Understanding requires the prior written agreement of the Participating UN Organizations and the Administrative Agent of the particular MDTF and needs to be cleared by the Fiduciary Management Oversight Group through the UN Development Operations Coordination Office (DOCO).

62 As indicated in the signature blocks.

63 This is the date that the Fund is expected to come to operational closure as stipulated in the TOR and all programmatic activities are expected to be completed.

64 The composition and role of the Steering Committee will be determined in line with the applicable UN rules and policies, and guidance for the Fund, namely the UNDG Guidance on MDTFs, and the UNDG Standard Operating Procedures for countries adopting the "Delivering as One" approach (SOPs).

65 In most cases the Administrative Agent will also be a Participating UN Organization. However, where the Administrative Agent is not a Participating UN Organization, this provision can be deleted.

66 As used in this document, an approved programmatic document refers to an annual work plan or a programme/project document, etc., which is approved by the Steering Committee for fund allocation purposes.

67 The level of detail of information included in the Report at different stages of the investigation process can be seen at <https://www.un.org/preventing-sexual-exploitation-and-abuse/content/data-allegations-un-system-wide>. Information is published both in real time and through monthly reports.

68 Additional signatories can be included through addendum



SOFF

Systematic Observations
Financing Facility

Weather and climate information for the global public good

[For more information on SOFF click here](#)

[For more information on the Alliance of Hydromet Development click here](#)