

The Systematic Observations Financing Facility: How will it work?

SYSTEMATIC OBSERVATIONS FINANCING FACILITY

Weather and climate information for the global public good



SOFF

Systematic Observations
Financing Facility

INTRODUCING THE SYSTEMATIC OBSERVATIONS FINANCING FACILITY

The Systematic Observations Financing Facility (SOFF) will support countries to generate and exchange basic observational data critical for improved weather forecasts and climate services. It will provide technical and financial assistance in new ways – applying internationally agreed metrics – the requirements of the Global Basic Observing Network (GBON) – to guide investments, using data exchange as a measure of success, and creating local benefits while delivering on a global public good. The SOFF will contribute to strengthen climate adaptation and resilience across the globe, benefitting in particular the most vulnerable.

The creation of the SOFF is spearheaded by the World Meteorological Organization in collaboration with a wide range of international organizations, including the members of the Alliance for Hydromet Development. The Alliance unites efforts of major development and climate finance partners to close the capacity gap on high-quality weather forecasts, early warning systems and climate information.

KEY TAKEAWAYS

1. The Systematic Observations Financing Facility (SOFF) will support countries in generating and exchanging basic observational data, which is critical for improving weather forecasts and climate services, and benefits all countries.
2. SOFF will provide technical and financial assistance in new ways – applying internationally agreed metrics to guide investments (the requirements of the Global Basic Observing Network - GBON), using data exchange as a measure of success, and creating local benefits while providing a global public good.
3. In its initial five-year implementation period, SOFF aims to support 68 SIDS and LDCs to achieve sustained GBON compliance. This will lead to more than a 10-fold increase of observational data from radiosonde observations and more than a 20-fold increase of data from weather stations, which will be internationally shared.
4. USD 400 Million are needed to cover the first 5-years of operation of SOFF to support all SIDS and LDCs in achieving GBON compliance.
5. SOFF support will be provided in three phases. In the Readiness phase, the country's hydromet status will be assessed, the GBON gap defined, and a plan developed to close the gap. The Investment phase enables countries to close the GBON investment and capacity gap. The Compliance phase supports sustained GBON compliance, and enables access to improved weather forecasts and climate analysis products.

6. SOFF will create a new, structured, and results-based partnership between the beneficiary countries, bilateral and multilateral SOFF funding partners, envisioned private sector contributors, and SOFF operational partners.

7. SOFF operational partners include the WMO as technical authority and verification partner, international development agencies as SOFF implementing entities including Multilateral Development Banks and UN organizations, the WMO Country Support Initiative as technical advisory partner, and participating Global Producing Centres as knowledge partners.

8. The SOFF institutional set-up requires a financing platform with a trustee, a Secretariat, and a Steering Committee. SOFF would ideally be integrated into an existing climate or environment related Financial Intermediary Fund. This would require adjustments in terms of governance and operational features of these funds. In the event that these adjustments cannot be accommodated, SOFF would be created as a self-standing financing mechanism.

9. The decision on the SOFF institutional set-up will be taken in collaboration with the potential funding partners and in coordination with the members of the Alliance for Hydromet Development.

10. It is envisaged to announce the creation of the SOFF at UNFCCC COP26

INTRODUCTION

The foundational role of surface-based observations

Our planet is increasingly experiencing extreme weather and climate conditions that negatively impact our lives and property, and affect the global economy. Improving our ability to create accurate weather forecasts and climate predictions is critical for managing risks and making the right decisions to build our resilience. Global Numerical Weather Prediction (NWP) and climate reanalysis are the backbones for all weather and climate information products and services. All this depends on having continued access to reliable real-time observations from the entire globe.

Whilst observations from many sources are used in NWP, improving surface-based observations are crucial to further improve NWP. Surface-based observations are reliant upon countries' resources, and then those countries sharing data internationally.

Current status of surface-based observations – not only bad, but getting worse

The inconsistency across the globe in both network density and the volume of surface-based observations internationally exchanged is striking. Some parts of the globe provide a reliable feed of observational data, but in many areas availability of such data is limited and, in several instances, getting worse.

For example, the European Center for Medium-range Weather Forecast (ECMWF) observed a dramatic decrease in the number of radiosonde observations of almost 50% in Africa from 2015 to 2020, the most important type of surface-based observations. This does not include the further decline in observations since January 2020 due to the impact of COVID-19.

Large data voids significantly limit the quality of weather and climate information. As these are used for informing decisions to address the impact of severe weather events and managing risks for effective climate adaptation and resilience, these decisions are impacted too.

The GBON opportunity

In 2019, the World Meteorological Congress and its 193 member countries and territories agreed to establish the Global Basic Observing Network (GBON). GBON is a landmark agreement and offers a new approach by which the basic surface-based observing network is designed, defined, and monitored at the global level. GBON sets out an obligation for all WMO Members to acquire and exchange essential surface-based observational data at a minimum level of spatial resolution and time interval.

Countries that are currently not meeting the requirements as set out by GBON¹ are described as having a GBON gap, based on draft GBON provisions. This gap is the amount of observational data exchanged that is needed in order to meet GBON requirements. Closing the GBON gap is highly economically efficient as, according to the World Bank, for every dollar invested at least twenty-six dollars in socio-economic return could be realized (see 'The value of Surface-Based Meteorological Observation Data: Costs and benefits of the Global Basic Observing Network' information brief for more detail).

In 2019, at the UNFCCC COP25, the Subsidiary Body for Scientific and Technological Advice (SBSTA) welcomed the development of the GBON and re-emphasized the need for sustained funding to meet the essential needs for global climate observation.²

THE FINANCIAL MODEL TODAY - UNREALISTIC, INEFFECTIVE, AND UNSUSTAINABLE

Investments in observing systems are increasing

Today, the members of the Alliance for Hydromet Development are investing at least USD 2.5 billion through their active portfolio on hydromet-related projects.³ Considering that this amount only includes Alliance members' financing, the total figure of hydromet funding is expected to be considerably larger, if national funding and other sources of bilateral and multilateral finance are considered.

Hydromet investments, including observing systems, are recognized as being critical in supporting disaster reduction and climate change action. The biggest portion of Alliance members' investments in hydromet (including in observing systems) tend to be part of larger adaptation and climate resilience projects. They provide a critical contribution in ensuring the effective spending of the billions expected to be invested in adapting to the changing climate.

About 20% of Alliance members' hydromet funding is allocated to supporting observing systems. However, there is a significant mismatch between the investments in observing systems and the progress in global observational data sharing.



What is 'Hydromet' funding?

These are investments directed to the provision of weather, climate, hydrological, and related environmental services across the hydromet value cycle. This includes investments in observational infrastructure, data and product sharing, numerical model application, early warning systems, contribution to disaster risk reduction and climate-related services, product dissemination and outreach, and strengthening national meteorological and hydrological services.

The mismatch between increasing investments and progress in data sharing

Despite substantial and growing investments in observing systems, the limited progress in global data sharing is a lost opportunity for smarter decision-making based on better weather and climate information data products for all nations.

Whilst the need for investment in observing systems is recognized, the provision of support to strengthen basic observations has considerable sustainability challenges. Many countries have limited capacity and face significant budget constraints in operating and maintaining observing systems, including having basic maintenance and adequate staff. Term-limited projects focusing on capital investment mostly expect countries to cover the operating and maintenance costs after the project is completed. This is an unrealistic assumption for many parts of the world.

Traditional observing systems-related development projects tend to be based solely on country-tailored considerations. This country-based approach fails to consider how investments in meteorological infrastructure might fit within a global design and data sharing. This ignores the trans-boundary nature of weather and climate observations.

Additionally, the distinction between 'observing systems' and 'observations' is often not appreciated. Many development and climate finance partners have invested in 'observing systems', and not in 'observations' (data sharing) which is what is actually needed. Unfortunately, it is not the case that investing in the former will somehow automatically lead to an improvement in the latter. This greatly limits the effectiveness of investments.

The need for a new financing model

A fully implemented GBON in Small Island Development States (SIDS) and Least Developed Countries (LDCs) requires a total functioning network of around 2300 surface-based stations. In order to meet this requirement, around 2000 observation stations will need to be rehabilitated or installed in these countries.

Closing the GBON gap in SIDS and LDCs will generate more than a 10-fold increase in the number of observations generated from radiosonde observations and more than a 20-fold increase of data from weather stations, all of which will be internationally shared (see 'The gaps in the Global Basic Observing Network (GBON)' information brief for more detail).

Achieving sustained compliance with the GBON requirements means substantial investment and strengthened capacity is needed in many countries, in particular SIDS and LDCs. The Systematic Observations Financing Facility (SOFF) is being established to provide technical and financial assistance to those countries that otherwise could not achieve compliance with the internationally agreed requirements.

SOFF DESIGN FEATURES

The Systematic Observations Financing Facility (SOFF) will support countries to generate and exchange basic observational data critical for improved weather forecasts and climate services. SOFF will contribute to strengthening climate adaptation and resilience across the globe, particularly benefitting the vulnerable.

SOFF will have three novel design features to provide long-term funding in an effective way:

- First, SOFF support is based on the global optimal and internationally agreed design to guide its investments – the GBON. SOFF will be in a position to allocate scarce resources in the most effective way in seeking to close the GBON gap.
- Second, SOFF will shift from a focus on short-term capital investments to long-term observational data exchange as a way of measuring results. SOFF is expected to cover capital investments in closing the GBON gap, as well contributing to the costs for operating and maintaining the system in the long-term. SOFF will provide results-based finance, triggered by GBON data exchange compliance.
- Third, SOFF will create local and regional benefits while providing a global public good. The global nature of NWP means that the benefits of GBON compliance will be realized both in the countries where the improvements are made and globally. Local forecasting and climate analysis in any given location benefits from improved observations from all over the globe.

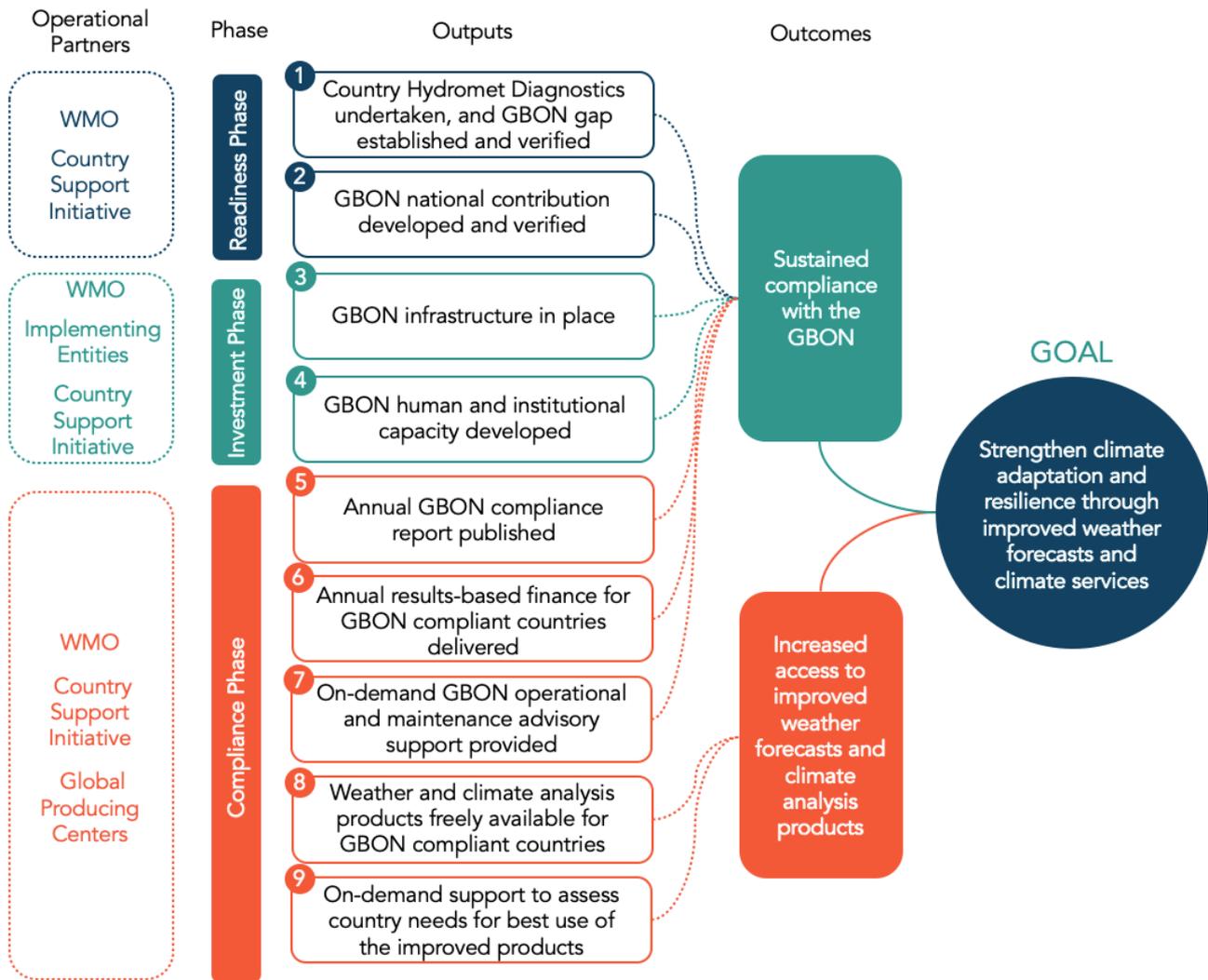


Figure 1 SOFF outcomes, phases, and operational partners.

SOFF TARGET

A sequenced implementation approach

It is envisioned that SOFF will operate with an initial five-year implementation period, during which it will prioritise support to SIDS and LDCs.

An independent external evaluation is planned to take place towards the end of this initial implementation period. Based on the evaluation results and lessons learned, the SOFF operational design can be further adjusted. This could include considering a potential expansion to other OECD Official Development Assistance eligible countries, as well as to other domains of earth observations as the GBON evolves.

In its initial five-year implementation period, the SOFF will:

- Support 68 SIDS and LDCs in closing their GBON gap, achieving GBON sustained compliance, and enabling access to improved weather forecasts and climate analysis products;
- Generate more than a 10-fold increase in observational data from radiosonde observations and more than a 20-fold increase in data from weather stations, which will all be internationally exchanged;
- Require USD 400 million – an amount that is less than what is currently invested in observations by the members of the Alliance for Hydromet Development.

SOFF support – Readiness, Investment, Compliance

In order to achieve its goal, SOFF will provide support in three phases: Readiness, Investment, and Compliance (see Figure 1).

SOFF PHASES

Readiness phase

Whilst SOFF will offer tailored and differentiated support to countries, all countries accessing support from the facility will undergo the Readiness phase. In the Readiness phase, the country's hydromet status will be assessed, their GBON gap defined, and a plan to close the gap will be developed. The Readiness phase delivers two outputs:

Output 1 - Country Hydromet Diagnostics undertaken and GBON gap established and verified.

The Country Hydromet Diagnostics assessment plays a foundational role in fostering a coordinated and prioritized support program to a country's hydromet development, beyond just enabling GBON compliance. The assessment will provide the analytical basis to ensuring that SOFF support is embedded into larger national hydromet development programs and projects which are supported by international development and climate finance partners.

From this assessment, the country's GBON gap can be defined. The gap assessment will produce a country inventory for the number and types of stations that need to be established, upgraded and/or rehabilitated, as well as the required human and institutional capacity needed to install, operate, and sustain compliance with the GBON requirements.

Output 2 - GBON national contribution developed and verified

Countries will be supported in developing their GBON national contribution to meet GBON requirements. This contribution will be verified by WMO, who are the SOFF technical authority. A verified national GBON contribution will be a condition that will need to be met in order to receive SOFF support in the investment and compliance phase.

Investment phase

The Investment phase will support countries in closing the GBON gap and achieving GBON compliance. The Investment phase delivers the next two outputs:

Output 3 - GBON infrastructure in place.

This includes investments relating to the procurement and installation of observation infrastructure, telecommunications, etc.

Output 4 - Developing GBON human and institutional capacity.

This includes developing capacity to operate and maintain the observing network.



What is the 'Country Hydromet Diagnostics'?

The Country Hydromet Diagnostics is a new tool and approach to assess National Meteorological Services and their contribution to high-quality weather, climate, hydrological and environmental information services and warnings. The tool provides a standardized and practical way to analyse the ten most critical elements the hydromet value cycle. One of the elements assessed is the country's GBON gap. For each element, maturity levels are assessed, indicating where additional focus and support is needed. The assessments are undertaken by peer meteorological services from other countries through the WMO Country Support Initiative. The Diagnostics aim is to inform policy and hydromet investment decision-making by providing the analytical foundation needed for better targeted and more coherent investments. The Country Hydromet Diagnostics is being developed with the members of the Alliance for Hydromet development, spearheaded and technically guided by WMO.

Compliance phase

Under the Compliance phase, SOFF will provide support to enable a country to sustain GBON compliance and to facilitate access to improved weather forecasts and climate analysis products.

The Compliance phase delivers five outputs:

Output 5 - Annual GBON compliance report published by WMO as the SOFF technical authority.

The compliance definition and verification will be based on a simple and transparent methodology using the publicly available WMO Integrated Global Observing System Data Quality Monitory System. The results of the GBON compliance report trigger Output 6.

Output 6 – Annual results-based finance for GBON-compliant countries delivered.

Results-based finance will be provided to countries for all their GBON-compliant stations. SOFF will contribute to covering the operational and maintenance costs needed for sustained GBON compliance. Each country starts at a different point, and the time required to reach full compliance will vary from country to country. Given the complexities and large gaps that several countries face, SOFF will support progressive GBON national compliance.

Output 7 - On-demand operational and maintenance advisory services provided through tailored and hands-on peer-to-peer support via the WMO Country Support Initiative.

Output 8 – Weather and climate analysis products freely available for GBON compliant countries through SOFF participating Global Producing Centres.

Output 9- On-demand support to assess country needs for best use of the improved products.

SOFF PARTNERSHIP

SOFF will create a new, structured, and results-based partnership between the beneficiary countries, bilateral and multilateral SOFF funding partners, envisioned private sector contributors, and the SOFF operational partners.

Beneficiary countries

For its initial five-year implementation period, SOFF will focus on and prioritize support to SIDS and LDCs. These countries face the largest capacity gaps and finance constrains in achieving and sustaining GBON compliance. Additionally, the second implementation period of SOFF could provide differentiated support to other OECD Official Development Assistance eligible countries according to certain eligibility criteria, such as GDP per capita and/or GDP per surface area.



What are WMO Global Producing Centres?

In 2006, the WMO began designating centres that make global seasonal forecasts as WMO Global Producing Centres of Long-Range Forecasts. These form an integral part of the WMO Global Data-Processing and Forecasting System. Through this designation process, Global Producing Centres of Long-Range Forecasts adhere to well-defined standards in data processing, which helps to create consistency across the network and enhances the usability of fixed forecast production cycles. They also have standard sets of forecast products, and WMO-defined verification standards for 'retrospective forecasts' – test forecasts that are made about past weather events that are then used to assess how accurate models are in making forecasts.

SOFF operational partners

SOFF operational partners include the WMO as the technical authority and verification partner, international development agencies as implementing entities, the WMO Country Support Initiative as the technical advisory partner, and participating Global Producing Centres as knowledge partners.

WMO as the SOFF's technical authority and verification partner

WMO is responsible for verifying the GBON national contribution and GBON compliance. This function will be performed by the WMO Secretariat, guided by the WMO Infrastructure Commission, and supported by the Global Producing Centres.

International development agencies as SOFF implementing entities

Major development partners, including Multilateral Development Banks and UN organizations, would become SOFF implementing entities. On behalf of the beneficiary countries, they will draw on SOFF financial and technical resources to close the GBON gap in the SOFF investment phase. They would blend SOFF resources with their own resources and ensure that achieving GBON compliance is integrated into larger hydromet development projects.

WMO Country Support Initiative as SOFF advisory partner

The WMO Country Support Initiative (CSI) is the WMO advisory services mechanism that is currently under development. It will provide standardized technical assistance to support countries and their implementing entities in achieving and maintaining GBON compliance. The CSI harnesses the technical expertise from the national meteorological services of WMO Members. By providing advisory services through the national meteorological services, they will deliver hands-on peer-to-peer support.

Participating Global Producing Centres as SOFF knowledge partners

The WMO Global Producing Centres translate observational data into tailored weather and climate products. Achieving GBON compliance will enable SOFF beneficiary countries to have access to higher quality products. Participating Global Producing Centers will contribute as SOFF knowledge partners to maximize the benefits to SOFF beneficiaries and GBON-compliant countries. This includes enabling free access to their improved weather and climate products, and providing on-demand basic support to these countries, assessing their needs to effectively use these products. They will also provide feedback on the quality of observations and measure the improvement of weather forecasts linked to improved observations.

SOFF funding Partners

SOFF creates an opportunity for bilateral and multilateral funding partners to leverage their existing investments. Through SOFF these partners will maximise the impact of their resources, as GBON data constitute a building block for climate adaptation and resilience investments.



How is creating SOFF a commitment of the Alliance for Hydromet Development?

The members of the Alliance for Hydromet Development are committed to seeking innovative ways to finance developing country surface-based observations, aiming at the creation of the Systematic Observations Financing Facility.

The Alliance was launched at COP25 and unites efforts of major development and climate finance partners to close the capacity gap on high-quality weather forecasts, early warning systems and climate information. The members of the Alliance for Hydromet Development include 12 founding 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, and World Meteorological Organization. The Climate Investment Funds joined the Alliance in October 2020.

TRANSLATING THE PARTNERSHIP INTO AN INSTITUTIONAL DESIGN

The SOFF institutional design requires a financing platform with a trustee, a Secretariat, and a Steering Committee.

The Steering Committee will be composed of SOFF contributors and potentially observers. It will be the decision-making body of the facility. Overseeing the overall activities of the facility, it will approve and amend SOFF governance documents, approve operational guidelines and ensure that the operations of the facility are consistent with its mandate and objective. It will also approve overall funding allocations and country requests.

The SOFF Secretariat will be accountable to the Steering Committee. It supports the work and decision making of the Steering Committee, receives and reviews support requests, and reports to the Steering Committee and the trustee on progress based on information provided by the SOFF operational partners.

Concerning the financing platform, SOFF would ideally be integrated into an existing climate or environment Financial Intermediary Fund (for example, the Climate Risk and Early Warning Systems initiative (CREWS) or Adapataion Fund (AF), Green Climate Fund (GCF), Global Environment Facility (GEF), Climate Investment Funds (CIF)). This would require adjustments to the governance and operational features of these funds in order to accommodate SOFF design features and operational elements. In the event that these adjustments are not possible, it is envisaged to create SOFF as a self-standing financing mechanism.

The AF, CIFs, GCF, and GEF are members of the Alliance for Hydromet Development. They could contribute to the SOFF either by integrating SOFF within an adjusted governance structure or by financially contributing to a new self-standing SOFF financing mechanism. In any case, SOFF would act as a catalyser for their larger investments, as GBON compliance will provide countries with more reliable upstream weather and climate information products and help to foster further alignment of hydromet investments.

The decision on the SOFF institutional set-up will be taken in collaboration with the potential funding partners and in coordination with the members of the Alliance for Hydromet Development.

It is envisioned that the announcement of the creation of the SOFF will happen at the UNFCCC COP26 in November 2021.

Endnotes

1. This is based on draft GBON provisions per 22 September 2020. Detailed GBON technical requirements will be submitted to the World Meteorological Congress for its approval in 2021.
2. Available at <https://undocs.org/pdf?symbol=en/FCCC/SBSTA/2019/L.15>
3. This is based on an analysis performed in June 2020 in collaboration with Alliance members, who provided information on their estimated active hydromet portfolio.

SPECIAL THANKS TO:

This information brief has been produced by the **World Meteorological Organization** in collaboration with Acclimatise. It is based on the work of the SOFF Working Groups established in February 2020 with members from: **Adaptation Fund, African Development Bank, African Risk Capacity, Asian Development Bank, Austrian Central Agency for Meteorology and Geodynamics, Climate Investment Funds, Climate Policy Initiative, Climate Risk and Early Warning Systems Initiative, Coalition for Climate Resilient Investment, Deutsche Gesellschaft für Internationale Zusammenarbeit, Deutscher Wetterdienst, Direction de la Météorologie Nationale de la SODEXAM Côte d'Ivoire, European Bank for Reconstruction and Development, European Centre for Medium-Range Weather Forecasts, Global Environment Facility, Green Climate Fund, Inter-American Development Bank, Insurance Development Forum, InsuResilience Investment Fund, Islamic Development Bank, Lloyds of London, Munich Climate Insurance Initiative, Oasis Loss Modelling Framework, Switzerland Federal Office for the Environment, UK Met Office, United Nations Development Programme, United Nations Environment Programme, Willis Towers Watson, World Bank, World Food Programme** and **World Meteorological Organization**.

FURTHER RESOURCES:

SOFF

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Alliance for Hydromet Development

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WMO

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