



Seventh Steering Committee **21 March 2024**

SOFF Independent External Review and Management Response

Decision 7.2

**Systematic Observations
Financing Facility**

**Weather
and climate
data for
resilience**



Decision 7.2: Endorsement of the SOFF Independent External Review and Management Response

The SOFF Steering Committee

Welcomes the findings of the SOFF Independent External Review with SOFF being considered as highly relevant, highly transparent, and highly effective; as the best viable option for countries to upgrade, maintain and operate their observation systems in a sustainable fashion; and as foundational for additional investments of other partners.

Endorses the SOFF Independent External Review and Management Response

Requests the SOFF Secretariat to act on the Management response and report back to the Steering Committee on actions taken at its 9th meeting in October 2024.

| |
|--|
| <p>This document contains the SOFF Independent External Review and the SOFF Management Response to its main recommendations.</p> |
|--|

1. Context

Following suggestions from SOFF Steering Committee members, in July 2023 an Independent External Review was commissioned to assess SOFF design and early implementation.

The review period encompassed preparation and design of the facility and the start of SOFF Readiness Phase implementation. The cut-off date for the review was 15 October 2023.

The outcome of the review aimed to inform (i) SOFF second- and third-year implementation, (ii) the SOFF external evaluation to be undertaken at the end of the SOFF First Implementation period that ends in July 2025, and (iii) SOFF funders and potential funders' decision-making processes related to future pledges.

The review consisted of four key components, (i) an online survey distributed to 159 stakeholders representing various SOFF stakeholder groups, (ii) 30 one-on-one interviews conducted with selected representatives from these stakeholder groups, (iii) a comprehensive desk review of SOFF documents, publicly available on the SOFF website, (iv) and a deep dive into four country cases.

The review (see section 3) considered SOFF as highly relevant, highly transparent, and highly effective; as the best viable option for countries to upgrade, maintain and operate countries' observation systems in a sustainable fashion; and as foundational for additional investments of other partners.

The review recommendations span a broad range of topics, including organizational issues and processes, the SOFF Secretariat, Advisory Board, complexity, capacity of SOFF operational partners and SOFF Secretariat, fundraising, scaling and expansion, regional approaches, and procurement, among others.

The Independent External Review was submitted for consideration and endorsement to the SOFF Steering Committee at its 6th meeting in November 2023. At the meeting, the Steering Committee requested the SOFF Secretariat to seek Steering Committee members' written feedback and to prepare a management response for consideration at the 7th Steering Committee meeting.

This document includes the SOFF Management Response to the main recommendations of the review (section 2) and the Independent External Review (section 3). The Management Response benefited from written comments on the review received by two Steering Committee members.

2. Management Response

| Transparency | |
|--|--|
| External Review Recommendations | SOFF Management Response |
| <ul style="list-style-type: none"> Reach to lower tiers in beneficiary countries NMHSs and operational partner agencies. Clearly communicate to all participants what the current financial resources are. | <p>The Independent External Review underlines the importance of maintaining transparency and efficient communication. SOFF will maintain a fully transparency approach in terms of SOFF documentation and decision making, with the SOFF portal on the UNMPTF website providing basic information and the SOFF website providing more detailed information. All Steering Committee documents including all documents involving financial decisions are available and searchable on the SOFF website while the dashboard on the SOFF website provides detailed information on each country operation and corresponding peer advisor and Implementing Entity engagement.</p> <p>Recognizing potential information gaps at lower tiers in beneficiary countries and operational partner agencies (peer advisors and Implementing Entities), targeted efforts to reach these audiences will be made. Additional communication avenues such as tailored regional workshops will be pursued. The Steering Committee through intersessional decision 2.1 already approved funding for regional workshops.</p> <p>Increased communication efforts between peer advisors and SOFF funders are encouraged to further increase transparency and promote complementarity between SOFF and other work</p> |

| | |
|--|---|
| | <p>on early warning systems that SOFF funders may be supporting through bilateral activities. The SOFF Secretariat will facilitate this communication.</p> <p>Recognizing the significance of financial information for investment planning, the basic financial information is available on the SOFF UNMPTF portal. In addition, going forward, the SOFF Secretariat will present at each Steering Committee meeting a more granular financial information of the fund, including financial projections.</p> |
| SOFF Secretariat | |
| External Review Recommendations | SOFF Management Response |
| <ul style="list-style-type: none"> • Be aware of tension between ambition vs realism, notably in the investment phase. • Consider further strengthening SOFF Secretariat portfolio management capacity. • Consider hiring a dedicated communications staff. | <p>62 countries have already been programmed to receive SOFF Readiness support through three Steering Committee decisions (Decision 3.4, Decision 4.4, Decision 5.4). In addition, there is currently unmet demand from 39 countries that have requested SOFF support. The Steering Committee, through its Decision 6.6 Updated Work Programme SOFF Implementation Period July 2022 to June 2025 responded to the tension between ambition, demand and realism, with in total 75 countries expected to receive Readiness support and 50 countries Investment phase support by June 2025, within the adopted funding target of USD 200 million. As part of the UN Early Warnings for All Executive Action Plan, SOFF is expected to deliver support to 100 countries by 2027 with a funding target of USD 400 million.</p> <p>The Secretariat recognizes the tension as reflected in Document 7.3 and will prepare a revised Resource Mobilization Strategy for 8SC that will specifically address how best to manage the tension between demand and resource availability</p> |

| | |
|--|--|
| | Through Decision 6.9 on the updated SOFF Secretariat budget the SOFF Steering Committee strengthened SOFF Secretariat portfolio management and communications capacity without increasing the SOFF Secretariat 2022-2025 budget with total SOFF overhead costs including SOFF Secretariat costs expected to remain slightly below 10 percent . |
| Advisory Board | |
| External Review Recommendations | SOFF Management Response |
| <ul style="list-style-type: none"> Do not fix what is not broken. | The role of the Advisory Board's role in fostering transparency and as a bouncing board for ideas, ensuring that it remains a space for open discussions and sharing information with a broad group of stakeholders, is recognized. The important role of the Advisory Board will be maintained while seeking ways to further enhance its value. |
| Competency and capacity | |
| External Review Recommendations | SOFF Management Response |
| <ul style="list-style-type: none"> Do not expand the group of Implementing Entities and Peer Advisors. With more entities, complexity increases. Keep this group as is and only at a later stage consider expanding it. | <p>28 countries have nominated their national meteorological offices to serve as peer advisors to provide long-term technical assistance on a cost recovery, non-profit basis. 9 multilateral development organizations including 5 Multilateral Development Banks are aiming expected to serve as SOFF Implementing Entity. Currently, 20 peer advisors and 8 Implementing Entities are actively engaged in SOFF (see INF 7.1 SOFF Implementation Progress)</p> <p>Given the complexity of SOFF operations with a current active portfolio of 60 countries and 28 peer advisors and 9 Implementing Entities, the SOFF Secretariat does not expect to expand the</p> |

| | |
|---|---|
| | group of peer advisors and Implementing Entities soon. The SOFF Secretariat will further facilitate exchange and learning among the current group of peer advisors and Implementing Entities as operations are rapidly unfolding. In addition, efforts will be made to fully mobilize all 9 Implementing Entities (see document 7.4 on Update on MDBs serving as SOFF Implementing Entities) and the currently not actively engaged peer advisors. |
| Financing and fundraising | |
| External Review Recommendations | SOFF Management Response |
| <ul style="list-style-type: none"> • Position SOFF as foundational element, as important delivery vehicle of the UN Early Warnings for All initiative. • Position SOFF as part of donors' contribution to avoid/decrease losses and damages. • Fundraising from donors is essential, but also develop a plan for contributions to the SOFF fund from international development and climate finance institutions and foundations. | <p>As highlighted in the SOFF Independent External Review, SOFF is speedily moving from the Readiness to the Investment Phase in many countries, and there is an urgency to step up SOFF resource mobilization efforts and has been intensively engaged with UN EW4All deliberations. It should also be recognized that while SOFF is indeed a critical pillar of the EW4All initiative, the benefits from improved observations extend far beyond EW to many other domains of development and climate action.</p> <p>Decision 7.3 proposes short term actions in response to the external review findings to enable SOFF to respond to country demand and deliver on the updated SOFF work programme 2022-2025, including an effort to establish SOFF as a financing channel for the new Loss and Damage Fund.</p> <p>SOFF is closely collaborating with the major multilateral climate funds. The SOFF Terms of Reference include in section 5.4 and 7.3 the collaboration and division of labor between SOFF and CREWS. CREWS is a member of the SOFF Steering Committee and Green Climate Fund, Adaptation Fund, Global Environment Facility and Climate Investment Funds are members of the SOFF Advisory Board. In other words, the climate funds review all SOFF Steering Committee documents and make recommendations before decisions are taken.</p> |

| | |
|--|--|
| <ul style="list-style-type: none"> • Closely cooperate with the multilateral climate funds to seamlessly integrate SOFF. • Enable countries to raise financing for the latter parts of the value chain, including through IFIs and the private sector. | <p>Following a request from the SOFF Steering Committee, the SOFF Secretariat developed with the Secretariats of these funds a Framework for Collaboration for enhancing Systematic Observation; the framework was signed at COP28 in November 2023. Going forward, all Investment funding requests presented to the SOFF Steering Committee for consideration will include a section showcasing the operationalization of this framework in the respective countries. The planned regional workshops offer another opportunity to engage with the climate funds for coordinated and scaled-up support to SOFF beneficiary countries.</p> <p>SOFF operations in currently 60 countries with peer advisors and Implementing Entities as operational partners offer the opportunity to crowd in additional resources from the Implementing Entities – either their own resources or resources mobilized from the major climate funds to which the Implementing Entities serve as accredited entity – for financing the latter parts of the value chain.</p> <p>Finally, the SOFF Secretariat will prepare an update of the SOFF Resource Mobilization and Outreach strategy for the 8th Steering Committee consideration, that will guide the way for future resource mobilization actions.</p> |
| Scaling and expansion | |
| External Review Recommendations | SOFF Management Response |
| <ul style="list-style-type: none"> • Scaling to Middle-Income Countries makes sense, but do not go too fast and follow a phased approach. | <p>The SOFF Steering Committee, through Decision 5.5 adopted the longer-term vision for SOFF expansion. A phased and carefully sequenced approach to potential SOFF expansion – in terms</p> |

| | |
|--|--|
| <ul style="list-style-type: none"> Scaling up to other earth observation domains: take sufficient time to get experience and analyze if the current SOFF design works and remain adaptable to adjust what is needed for potential future expansion. | <p>of beneficiary countries for investment and compliance phase support and earth observation domains – is required.</p> <p>The SOFF Secretariat will consult and seek guidance from the 8th Steering Committee on the future potential expansion trajectory.</p> |
| Regional approaches | |
| External Review Recommendations | SOFF Management Response |
| <ul style="list-style-type: none"> Explore regional approaches to SOFF implementation, including regional entities as executing agencies. | <p>The SOFF Steering Committee through the Intersessional Decision 2.1 approved funding for SOFF regional engagement and workshops. SOFF regional engagement will focus on potential economies of scale for SOFF implementation, including procurement, operations and maintenance arrangements as well as regional entities as potential executing agencies, as well as collaboration with other climate funds and development partners for embedding SOFF within larger packages of support.</p> |
| Procurement | |
| External Review Recommendations | SOFF Management Response |
| <ul style="list-style-type: none"> Explore options to speed up procurement. | <p>Understanding that procurement is pivotal for maintaining momentum during the Investment phase, the challenges posed by the several Implementing Entities serving in the same region are acknowledged. While for many countries single-country procurement of observation infrastructure is expected to be the prevailing model, in particular for SOFF investments in SIDS</p> |

| | |
|---|--|
| | options will be explored for coordinated procurement incl potentially through a third party international or regional entity. |
| Operations relationships | |
| External Review Recommendations | SOFF Management Response |
| <ul style="list-style-type: none"> Foster stronger relationships between beneficiary country agencies, Peer Advisors and Implementing Entities and involve Implementing Entities as soon as possible in the readiness phase. | <p>According to the Operational Manual, sections 4.5.1, beneficiary countries select their peer advisors and Implementing Entities, and they are expected to closely work together from the start.</p> <p>Taking into consideration that SOFF operations unfolded speedily since the first funding decisions were taken in March 2023 and that SOFF work is new territory, both, for countries as well as peer advisors and Implementing Entities, in some instances the communication between peer advisors and Implementing Entities could have been improved. Going forward, the SOFF Secretariat will ensure that all peer advisors and Implementing Entities fully comply with the request for early close collaboration.</p> |
| Compliance framework | |
| External Review Recommendations | SOFF Management Response |
| <ul style="list-style-type: none"> Develop the compliance framework to ensure that it is in place when the first countries reach that phase and explore how to effectively transfer the money to national agencies. | <p>The Operational Manual in section 4.5.3 describes the SOFF compliance phase and provides the basis for the SOFF Compliance Phase framework.</p> <p>Through Decision 5.8 the Steering Committee adopted the SOFF Investment Phase Framework. Unless a beneficiary country is fully GBON compliant and the peer advisors assesses the need</p> |

| | |
|--|---|
| <ul style="list-style-type: none"> • Develop clear guidelines regarding SOFF Compliance Phase financial contributions to SIDS, LDCs and MICs. | <p>for SOFF Compliance phase support to maintain compliance, countries are expected to move to the Compliance phase earliest in 2027, dependent on the length of the Investment phase operation that supports the country to achieve GBON compliance. The lessons learned during early implementation of the Investment phase and its implications for the Compliance phase are of critical importance.</p> <p>Therefore, at the 8th SOFF Steering Committee meeting, scheduled to take place in June 2024, the SOFF Secretariat will consult the Steering Committee and seek guidance on the appropriate timing and potential phasing for developing the SOFF Compliance phase framework.</p> <p>Initial calculations of SOFF Compliance phase financial needs were based on an average of 75 percent annual contribution to the total operations and maintenance costs, including institutional and human capacity costs. As part of the work to develop the Compliance phase framework this will be reviewed.</p> |
|--|---|

Systematic Observations Financing Facility (SOFF)

Independent External Review

October 30, 2023

Karin Kemper, Senior Advisor

Table of Contents

| | |
|---|-----------|
| Acknowledgments..... | 15 |
| Executive Summary..... | 16 |
| 1. SOFF Background | 18 |
| 2. Objective of this Review | 20 |
| 3. Methodology..... | 20 |
| 4. Findings and Analysis | 21 |
| 4.1 Overview | 21 |
| 4.2 Relevance | 22 |
| 4.3 Transparency | 22 |
| 4.4 Efficiency | 23 |
| 4.5 Effectiveness | 23 |
| 4.5.1 SOFF Secretariat performance | 23 |
| 4.5.2 Closing the GBON gap and SOFF design | 24 |
| 4.5.3 Advisory Board | 24 |
| 4.6 Sustainability | 24 |
| 4.6.1 Financial and institutional incentives for beneficiary countries..... | 25 |
| 4.6.2 Long-term availability of financial support to SOFF..... | 25 |
| 4.7 Scalability and Scaling | 25 |
| 4.8 Coherence, complementarity, and leverage | 26 |
| 4.8.1 Coherence and Complementarity with the global climate finance architecture | 26 |
| 4.8.2 Mobilization of additional resources for investments in the latter part of the meteorological value chain | 26 |
| 4.9 Fundraising | 27 |
| 5 Recommendations | 27 |
| 5.1 What to do right now | 27 |
| 5.1.1 Organizational Issues and Processes..... | 27 |
| 5.1.2 Financing and Fundraising | 28 |
| 5.1.3 Scaling and expansion..... | 29 |
| 5.2 How to prepare for SOFF's next phases | 29 |
| References | 31 |
| List of Figures | 31 |

| | |
|---------------------------------|----|
| Annex 1 | 32 |
| Deep Dive – Country Cases | 32 |
| Annex 2 | 35 |
| Online Survey Results | 35 |
| Annex 3 | 46 |
| Stakeholders Interviewed | 46 |

Acknowledgments

The reviewer extends her deepest gratitude to all interviewees and survey respondents for their invaluable insights on SOFF. Special recognition is accorded to the dedicated team at the SOFF Secretariat. Their exceptional support in coordinating interviews, administering the survey, and analyzing data was instrumental to the success of this review.

Executive Summary

The Systematic Observations Financing Facility (SOFF) is a new specialized UN fund to support countries in closing today's significant basic weather and climate observation gaps as defined by the internationally agreed Global Basic Observing Network (GBON). SOFF became operational in July 2022 and as of now provides Readiness support to 59 beneficiary countries.

The independent external review was commissioned to (i) assess SOFF design and early implementation to inform further SOFF implementation, (ii) inform the external evaluation expected to be undertaken in 2025, and (iii) inform existing and new funders' decisions on further pledges to the SOFF UN Multi-Partner Trust Fund.

The review is based on results from a stakeholder online survey, stakeholder interviews and SOFF document review.

The main findings of the review are:

- **Relevance:** SOFF is considered highly relevant from both global and national/local perspectives, with excellent performance to date. Its design is considered innovative and fit-for-purpose. The benefits from SOFF are deemed to go beyond filling the GBON data gap and improving global and local forecasting. They are regarded as the foundation and the systemic improvement that is needed for countries to address their longer-term needs for better weather, climate and early-warning infrastructure and services, both physical, institutional and financial.
- **Transparency:** Overall, the SOFF program approach is considered highly transparent. Respondents highlighted access to information and the responsiveness of the SOFF Secretariat as well as the clarity of the rules of the game for countries to access SOFF resources. Several interviewees highlighted the positive role of the Advisory Board. Transparency and speedy delivery so far have led to high credibility.
- **Efficiency:** The majority of interviewees felt that getting access to SOFF, getting paired with a Peer Advisor and starting the work went smoothly. Respondents acknowledged the learning-by-doing approach with the expectation that future rounds will improve further.
- **Effectiveness:** The effectiveness of the SOFF program to date has been notably high. Both interviewees and survey respondents gave the SOFF Secretariat exemplary ratings. Similarly, the effectiveness of the Advisory Board received high commendations.
- **Sustainability:** Across stakeholder groups SOFF is seen as the best available option for countries to upgrade, maintain and operate their observation systems in a sustainable fashion. Incentives provided by SOFF design are considered as largely adequate to lead to long-term sustainability. To support countries in the long run at adequate levels, SOFF will need to raise more funding.
- **Scalability:** All interlocutors acknowledge the scalability of SOFF design, both vertically (expansion of SOFF financial support to Middle-Income Countries) and horizontally (expansion to other earth observation domains). While stakeholders see the potential for scaling up SOFF, they recommend

careful scaling, focusing first on MICs as a priority while delivering on current ambition, rather than horizontal expansion.

- **Coherence, complementarity and leverage:** SOFF is considered as coherent with and complementary to the existing climate finance architecture. All stakeholders considered that SOFF has a clear role to play and provides a “foundational” service for additional investments. Interviewees agreed that SOFF has an important role to play in the context of the UN Early Warnings for All initiative.
- **Fundraising:** SOFF has had a very successful trajectory so far and has been delivering on all aspects covered in this Review. The foundations have been laid for the continued delivery of the program, and its early success has led to high expectations for further SOFF implementation. Adequate funding will be crucial for SOFF to continue meeting these expectations.

In this spirit, the review makes the following main recommendations:

- **What to do right now**
 - Transparency: Make efforts to reach the lower tiers in beneficiary countries NMHSs and operational partner agencies
 - SOFF Secretariat: Be aware of the tension between ambition vs realism, notably in the more complex investment phase
 - Advisory Board: “Do not fix what is not broken”
 - Competency and capacity: Do not expand the group of Implementing Entities and Peer Advisors
 - Financing and fundraising: Clearly position SOFF fundraising as foundational investment, as important delivery vehicle of the UN Early Warnings for All initiative, and as part of donors’ contribution to avoid/decrease future losses and damages
 - Scaling and expansion: Scaling to Middle-Income Countries makes sense, but do not go too fast and follow a phased approach
- **How to prepare for SOFF’s next phase(s)**
 - Explore regional approaches to SOFF implementation, including regional entities as executing agencies
 - Explore options to speed up procurement
 - Foster stronger relationships between beneficiary country agencies, Peer Advisors and Implementing Entities and involve Implementing Entities as soon as possible in the readiness phase
 - Develop the compliance framework now
 - Fundraising from bilateral donors is essential, but also develop a plan for contributions to the SOFF fund from international development and climate finance institutions and foundations
 - Closely cooperate with the multilateral climate funds to seamlessly integrate SOFF
 - Enable countries to raise financing for the latter parts of the value chain, including through IFIs and the private sector

1. SOFF Background

The Systematic Observations Financing Facility, commonly referred to as SOFF, is an innovative climate fund with its Secretariat administratively housed in the World Meteorological Organization (WMO). Its development commenced in 2019 with the primary goal of creating a sustainable financing mechanism to support essential weather and climate observations in developing countries. This initiative arose in response to the agreement by all 193 WMO member states and territories to meet a common minimum standard known as the Global Basic Observing Network (GBON) for collecting and sharing surface based and upper air weather and climate data. However, it became evident that many developing countries, including Least Developed Countries (LDCs) and Small Island Developing States (SIDS) lacked the financial means and capacity to meet these standards. To address this issue, the Alliance for Hydromet Development¹ committed to the development of SOFF. Following a comprehensive stakeholder consultation process, SOFF was legally established as a United Nations Multi-Partner Trust Fund in November 2021, by the WMO, UNDP (United Nations Development Programme) and UNEP (United Nations Environment Programme). The SOFF Secretariat was established in January 2022, and the Nordic Development Fund made the first funding decision in March 2022. The institutional framework of SOFF, including the Steering Committee and Advisory Board, was adopted by the first SOFF Steering Committee that took place in June 2022, and the SOFF Operational Manual was adopted in October 2022.

According to its Operational Manual, SOFF's primary objective is "to support SIDS and LDCs by providing grant financing and technical assistance for the sustained collection and international exchange of surface-based weather and climate observations according to the GBON regulations." The implementation of GBON is expected to significantly enhance the provision of high-quality weather forecasts, early warning systems, and climate services at global, regional, and national levels. GBON data are crucial for effective, resilient development and climate adaptation action that results in saved lives, improved livelihoods, and protected property. (SOFF Operational Manual, 2022)

SOFF's support aims to systematically address the persistent challenges that lead to missing weather and climate observations. Two distinctive features of SOFF are particularly noteworthy: first, it recognizes the historical difficulties of development programs when countries cannot finance the operation and maintenance of their investments. SOFF aims to address this issue by committing to long-term finance and adopts a results-based approach, providing a substantial contribution to operations and maintenance (O&M) costs to countries contingent upon their maintenance of infrastructure and continued data sharing in the GBON system.² Second, SOFF places strong emphasis on capacity building by pairing national meteorological agencies in beneficiary countries with advanced meteorological agencies as Peer Advisors, both from developed and developing nations.

SOFF operates as a partnership among its co-founders, funding partners, beneficiary countries, Implementing Entities (IEs), Peer Advisors and members of its Advisory Board. Its support to countries is

¹ The Alliance for Hydromet Development is a group of 14 major international development, humanitarian and climate finance institutions, collectively committed to scale up and unite efforts to close the hydromet capacity gap by 2030. <https://alliancehydromet.org/>

² For the initial calculation of the USD 400 million SOFF funding needs, an average of 75% contribution for SOFF Compliance phase O&M support was calculated.

provided through three phases implemented in close collaboration between beneficiary countries, IEs and Peer Advisors: The Readiness Phase, Investment Phase and Compliance Phase. The Readiness Phase officially began in March 2023 when the Steering Committee approved the Readiness funding requests made by 26 countries.

During the Readiness Phase, SIDS, LDCs and other Overseas Development Aid (ODA)-eligible countries can access technical assistance provided by SOFF Peer Advisors to undertake the GBON National Gap Analysis, develop the GBON National Contribution Plan, and conduct the Country Hydromet Diagnostics to assess the national meteorological service, its operating environment and its contribution to high-quality weather, climate, hydrological and environmental services and warnings. This will be followed by the Investment Phase, for which for the time being SIDS and LDCs can receive grants and advisory support to establish their GBON stations and strengthen the human and institutional capacity needed to implement the GBON National Contribution Plan, supported by Implementing Entities. Finally, during the Compliance Phase, the National Meteorological and Hydrological Services (NMHSs) receive results-based finance and on-demand Peer Advisory to support the Operation & Maintenance of internationally sharing GBON stations.

As of October 15, 2023, 62 countries are programmed, with an additional 39 countries requesting SOFF support. Among these, Readiness funding for 59 countries has been approved and Readiness work is on-going. SOFF Readiness funds were approved in three phases:

- I. March 2023 [Decision 4.3](#) – 26 countries approved as the first batch
- II. June 2023 [Decision 5.3](#) – 10 countries approved as the second batch
- III. September 2023 [Intersessional Decision 1.1](#) – 23 countries approved as the third batch

So far, 49 Readiness outputs have been delivered which includes 25 National Gap Analyses (NGA), 12 National Contribution Plans (NCP) and 12 Country Hydromet Diagnostics (CHD).

Furthermore, six fast-track countries have completed all Readiness activities and are set to request Investment support during the upcoming sixth Steering Committee meeting in November 2023. SOFF Readiness implementation progress is closely monitored by the SOFF Secretariat and summarized in the figure below.

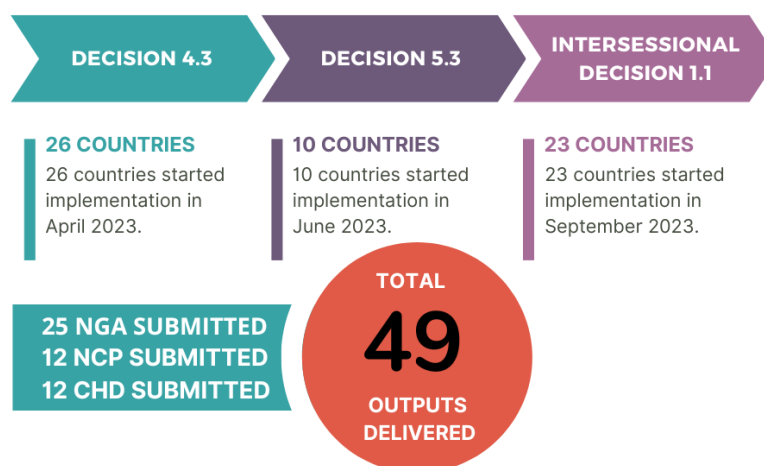


Figure 1: Readiness Phase status as of October 15, 2023. Source: SOFF Secretariat

While SOFF has primarily concentrated its support so far on SIDS and LDCs, Readiness support to Middle-Income Countries (MICs) that have been identified as initial focus countries of the UN's Early Warning for All (EW4All) Initiative has been provided. Ongoing discussions are exploring the vertical scaling of SOFF by incorporating Middle Income Countries (MICs). Furthermore, there are deliberations about broadening SOFF horizontally in the long term to encompass other earth observation domains, extending beyond land-based observations to potentially include marine, hydrological and cryosphere observations.

2. Objective of this Review

The objective of this independent External Review is to assess SOFF design and early implementation until October 15, 2023. This period encompasses both preparation and design of the program as well as the start of the Readiness Phase implementation, which commenced on March 22, 2023.

The outcome of this Review aims to:

- **Inform SOFF second and third-year implementation (SOFF first implementation period 2022-2025)**, including potential expansion of SOFF investment and compliance support to MICs (for SOFF Steering Committee consideration 27 November 2023) and SOFF as a delivery vehicle of the UN Early Warnings for All (EW4All) initiative.
- **Inform SOFF external evaluation** to be undertaken in the third year of SOFF implementation
- **Inform SOFF funders and potential funders' decision-making processes** related to future pledges

Considering that SOFF implementation is in an early stage, the Review focuses on tangible aspects of the SOFF trajectory so far, taking into account:

- SOFF design, institutional set-up and processes as well as early indications regarding SOFF scalability, and
- SOFF's role in the context of international climate finance infrastructure, including EW4All, both in the context of beneficiary countries' access to SOFF finance and SOFF fundraising.

Specifically, the aspects covered are:

- Relevance of SOFF for global and national weather and climate observations
- Efficiency (SOFF design and institutional set-up)
- Effectiveness (SOFF design and institutional set-up, including early impact)
- Sustainability (SOFF design)
- Transparency (SOFF processes and documentation)
- Scalability
- Coherence, complementarity and leverage (SOFF within the climate finance architecture and SOFF contribution to mobilization of additional resources for investments in the latter part of the meteorological value chain)
- Fundraising (closing the SOFF funding gap, including as part of the EW4All initiative and as part of the Loss & Damage funding arrangements)

3. Methodology

The methodology employed for this Review consists of four key components:

- (1) An online **survey** distributed by email to 159 stakeholders representing various SOFF stakeholder groups: beneficiary country NMHSs, Peer Advisor NMHSs, Implementing Entities, Steering Committee members (including funders, founding organizations and stakeholder group representatives), and Advisory Board members.
- (2) 30 one-on-one **interviews** were conducted with selected representatives from these stakeholder groups, as well as members of WMO and SOFF Management.
- (3) A comprehensive desk review of SOFF **documents**, publicly available on the SOFF website's document library which included documents like the SOFF MoU, SOFF ToR, SOFF Operational Manual, Steering Committee decision documents, Advisory Board recommendations, and others (Website: [un-soff.org/document library](http://un-soff.org/document%20library)).
- (4) A deep dive into four country cases (Fiji, Maldives, Mozambique and Tanzania), based on the interviews and documents, providing insights into these countries' experiences with SOFF (see Annex 1)

The online **survey** took place from August 24 to Sep 20, 2023, with a total of 59 stakeholders (=37 percent) participating. The survey was anonymous. Participants could opt to provide their emails and a small group chose to do so. The survey questions and results are attached in Annex 2.

Interviews were carried out from August 24, 2023 to Oct 16 2023. They followed an open-ended format that permitted the interviewer to go more deeply into the various aspects and allowed the interviewee to spontaneously add their points of view and suggestions. Annex 3 shows stakeholders interviewed.

The **document review** took place throughout the process.

Input received through the above instruments permitted the Reviewer to create a composite picture of SOFF for the analysis. This early Review can only focus on what has been achieved so far, including the process that has been followed to get the SOFF program to its current stage, its design elements, the first phase (Readiness Phase) from which as of October 15, 2023, 59 countries were benefitting, as well as stakeholder expectations and recommendations regarding the future, based on these first experiences.

4. Findings and Analysis

This section presents the findings from both the online survey and the interviews, including the country deep dive presented in Annex 1. The interviews enabled a more profound exploration of certain survey responses and played a pivotal role in interpreting the survey findings.

4.1 Overview

SOFF is considered highly relevant, with excellent performance to date, expressed in both the efficiency with which SOFF has taken off the ground and effectiveness in terms of the Secretariat's/WMO's performance. Transparency and delivery so far have led to high credibility – and also expectations. Early results are still very limited. SOFF is considered foundational to provide beneficiary countries with the basic operative infrastructure to collect and share data within the GBON. It is acknowledged as the essential pillar at the top of the meteorological value chain to enable downstream investments to work.

Stakeholders have high expectations for SOFF's conclusion of the Readiness Phase and the upcoming Investment and Compliance Phases. The design is considered to be fit-for-purpose and processes highly transparent. Stakeholders see the potential for scaling up SOFF, but the vast majority recommend

delivering on current goals and commitments to enable learning from experience and to avoid spreading SOFF resources (funds, staff, stakeholder ability to absorb and to improve) too thin.

The following sections develop the above in detail. Recommendations are presented in Section 5.

4.2 Relevance

The SOFF program is considered highly relevant. Study participants (defined as all types of stakeholders who either answered the survey or participated in the interviews) were almost unanimous in this assessment, with one outlier who consistently provided low ratings on almost all aspects in the survey.

There was a slight difference in participants' assessments if SOFF was more relevant for the improvement in *local* weather forecasting or for the improvement of *global* weather forecasting. Both, developing country and global North representatives placed emphasis on the local benefits that could be achieved by improving the global models which would then improve local forecasting. However, developing country representatives tended to more explicitly highlight the national/local benefits from SOFF investments in upgrading and replacing outdated meteorological infrastructure and software as a foundation for further improvements of their systems. There was clear agreement though that overall SOFF is a highly relevant program from both global and national/local perspectives.

Regarding climate forecasting, survey results show a slightly wider spread in opinions, ranging from 7 to 10 on a scale of 10 and with a slightly higher overall rating by countries' NMHSs, SOFF funders and Steering Committee members. As was pointed out by various interviewees, many developing countries currently have no climate data time series. They cannot prove that there has been a change in their climate which in turn limits their options to access climate finance beyond SOFF. SOFF investment is therefore important for the future because it will kick-start building time series from now onwards. As a forward-looking initiative, it will help countries develop the data to be used both to inform climate risks (including insurance) and possibly access to climate finance.

Both survey respondents and interviewees were asked regarding their opinion about SOFF's relevance with respect to the UN's Early Warning for All (EW4All) Initiative. In the survey, the average assessment again is positive to very positive, but with a wider spread, ranging from 6 to 10. All interviewees considered SOFF important in the context of EW4All. Various interlocutors pointed out that SOFF as Pillar 2 is essential for the initiative because it provides the upstream investment that is needed to make all other downstream actions work. Notably Implementing Entities tended to focus on the distinction between SOFF as a program that provides data while Early Warning (EW) needs significant investment in operationalization, including at the community level. It was also pointed out, however, that SOFF has an objective in itself (i.e. help vulnerable countries close the GBON gap) and that it should not be distracted by its role within EW4All.

4.3 Transparency

In interviews, the majority of respondents considered the SOFF program approach to be highly transparent. Respondents highlighted access to information, notably through the SOFF website, the responsiveness of the SOFF Secretariat as well as clarity of the rules of the game for countries to access SOFF. Survey responses regarding the specific question how transparent SOFF *access to funding* is, were slightly more nuanced, with a spread of answers between 6 and 10 (average to very positive). Notably,

beneficiary countries, Advisory Board members and Implementing Entities rated transparency in access as overall higher than SOFF Peer Advisors and Steering Committee Members.

This might also be reflected in some interviewees' statements that while they felt that the program was transparent overall, there were also aspects they did not understand about it. This included their understanding of what the potential budget for future O&M would be and how it would influence the design of the National Contribution Plan. Notably at mid-level management in national agencies, respondents were more at arm's length from the Secretariat and decision-making groups and felt less in the know than those who were more directly involved. The overall sentiment, however, was that at this point all eligible countries have been informed that the program exists and that they can access it and that they are taking advantage of this possibility as evidenced in the significant number of countries (59) that have approved Readiness funding requests.

Several interviewees also highlighted the positive role of the Advisory Board which permits involvement of a diverse group of organizations to contribute to SOFF and be involved in its processes, further increasing transparency.

4.4 Efficiency

The great majority of interviewees felt that getting access to SOFF, getting paired with a Peer Advisor and starting the work went smoothly. A few countries and Peer Advisors had encountered administrative or organizational difficulties, either in their own organizations or in setting up readiness work with their counterpart. In the survey, beneficiary country NMHSs were very positive (average 8.21 among 24 respondents) regarding how smooth the process had been to set up the readiness work with the Peer Advisors while Peer Advisors felt that the process could have been smoother (average of 5.95 among 18 respondents of this group). Some interviewees, and also survey write-ins, highlighted that documents were being written and revised as the program was being developed, which led to some confusion and extra effort, lowering the efficiency of the process.

In the in-depth interviews, a general sense prevailed, however, that this was the first batch of countries and the first time that processes were developed and tried out and that in future rounds the process would be (even) more efficient. One participant captured this spirit when he said "The whole SOFF Program is a pilot. Everyone is learning by doing".

4.5 Effectiveness

Effectiveness of the SOFF Program so far can be considered high. This aspect was assessed with two proxies: one with direct questions regarding the performance of the SOFF Secretariat, and the other with prospective questions if the stakeholders believe that SOFF program design will lead to closing the GBON gap and will keep it closed. In addition, performance of the current Readiness Phase and effectiveness of the Advisory Board have been factored into this analysis.

4.5.1 SOFF Secretariat performance

Both interviewees and survey respondents rated the SOFF Secretariat highly with an average of 8.19 (very positive on a scale of 1 to 10) among 59 survey respondents and 100% by interview respondents. Interviewees would use expressions such as "outstanding", "never seen before", "gotten it off the ground with amazing speed", "brilliant" etc. The SOFF Secretariat is seen as very effective in its communication with stakeholders, including responding to questions from beneficiary countries or Peer Advisors or any

other stakeholder as well as preparation of documents for both Steering Committee and Advisory Board meetings and follow-up on decisions taken. Similarly, interviewees were very positive about the performance of the WMO Technical Authority which works hand in hand with the SOFF Secretariat.

That said, a number of forward-looking suggestions were made for the Secretariat. Interviewees and also some survey write-ins suggested to improve further on communication of deadlines and to consider the trade-off between speed versus clarity of procedures. Various survey write-ins highlighted the importance of considering which deadlines to set, pointing out that even in developed countries agencies struggle due to capacity issues and that the rapid succession of batches does not allow learning that could lead to design improvements.

4.5.2 Closing the GBON gap and SOFF design

Interviewees as well as survey respondents were very positive in their expectation that SOFF will help countries close the GBON gap and that it is designed in such a manner that the GBON gap will remain closed. Both survey and interview responses followed a similar pattern.

In response to the more granular question if the financial and institutional incentives designed into SOFF are sufficient to keep the GBON gap closed, expectations drop somewhat to slightly under 8 for beneficiary country NMHSs and to between 6 and 7 for peer agencies. In the in-depth interviews, respondents would highlight that while one has to wait and see, SOFF is the best program approach that they have seen so far, that it builds on the learnings from other (often failed) programs and that it is the best option on the table to achieve success in the aim to make national and global forecasting better. This dose of realism cut across all stakeholder groups.

4.5.3 Advisory Board

According to the SOFF Manual, “the Advisory Board brings together relevant stakeholders across the meteorological value chain to provide recommendations to the Steering Committee”. Both survey and interview results pointed to a favorable view of the Advisory Board’s function and work so far. SOFF Funders and Steering Committee Members rated Advisory Board effectiveness with an average of 8.75. Advisory Board members themselves rated it at an average of 7.6. Interviews highlighted the important function of the Advisory Board to allow for discussions on substance and sorting out potentially contentious issues before they are taken up by the Steering Committee. A couple of interviewees considered the most important aspect of the Advisory Board that diverse organizations, ranging from the private sector to UN agencies, participate in it, thus enhancing transparency and communication around SOFF.

4.6 Sustainability

Related to the above is the question if the SOFF program will be sustainable. This Review aimed to assess this aspect in various ways. First, in terms of financial and institutional incentives for beneficiary countries: SOFF is designed to cover substantial parts of the O&M costs in the Compliance Phase, using a results-based approach, i.e. countries will only receive this funding if they generate and internationally exchange the GBON data. Second, in terms of long-term availability of financial support for the SOFF UN fund: such support can come from a combination for instance donors, multilateral development banks and climate funds, the private sector and foundations.

4.6.1 Financial and institutional incentives for beneficiary countries

Both interviewees and survey respondents consider the incentives provided by SOFF design to be largely adequate to lead to long-term sustainability (average of 7.78 of 58 respondents; higher for beneficiary country NMHSs and lower for Peer Advisors). Interviews revealed the following nuances: the concern that the initially envisioned 75% coverage of O&M costs may be sufficient for the larger countries, but not for smaller, financially weaker countries and/or for countries where travel is very costly (for instance due to large distances between islands such as in the Pacific and/or countries with difficult travel terrain). Furthermore, there is an expressed uncertainty regarding the extent of the financial contribution to be provided. It is essential to strike a balance between what is desirable in terms of technical demands for GBON and what is feasible in terms of available finance.

Multiple stakeholders emphasized that SOFF may not resolve everything, but that it is the best there is in design right now. Many stated that old program designs that do not cover financing of O&M have clearly not been sufficient. Donor and peer advisors overall were more cautious in their outcome expectations than recipient countries (also reflected in the survey), but all agreed that SOFF design is an improvement over other approaches in this field and that SOFF is an essential step forward if one wants to have a chance to get better global and therewith local data, models and forecasting.

4.6.2 Long-term availability of financial support to SOFF

To support countries in the long run at adequate financing levels, SOFF will need to raise more funding. The SOFF ToR and the UN EW4All Executive Action Plan estimate an initial funding need of US\$400 million for the first 5-year period. So far, US\$73 million of funding have been pledged by a group of 12 donors. Several of those are indicating willingness to continue funding and additional donors are considering joining SOFF. Interviews showed a clear understanding among stakeholder groups, that in the long term donor funding is only one piece of the financial picture. Additional sources to be explored are financial contributions to the SOFF UN fund through entities such as the Green Climate Fund (GCF) and other multilateral development and climate finance institutions. In addition, multilateral financing institutions can contribute directly to countries' national investment plans and further leverage the impact of SOFF investments within their country and/or regional programming. In the context of this initial Review, it was not expected that all avenues had already been explored. Accordingly, it is noted here that stakeholders are aware of the need to continue driving the long-term aspect of SOFF finance and that they expect it to be included in deliberations and actions soon.

4.7 Scalability and Scaling

Interlocutors acknowledged the scalability of SOFF design, but expressed different perspectives on desirability, risks and opportunities regarding scaling up at this very moment. Some stakeholders focused on adding further countries (MIC expansion, scaling vertically). Others focused on scaling SOFF horizontally by broadening out into marine and further earth/climate observations.

Interviews revealed a clear distinction regarding the ability to scale SOFF and the desirability to speedily scale SOFF at this point in time. The majority pointed out that SOFF is in its first phase, that it has been successful and effective so far. They were however aware of the challenges in the upcoming Investment Phase and of the fact that at this moment it is not clear if existing finance will be sufficient to cover the Investment Phase funding requests expected to be delivered by the first batches of SOFF-programmed countries. The general sentiment therefore was for SOFF to focus on delivery, to learn from the process,

and to scale up in a carefully phased and prioritized manner. SOFF should also apply its learning-by-doing approach so that lessons from early batches can be incorporated into SOFF operations. In general interlocutors considered scaling to MICs as the next step while scaling horizontally into other earth observation domains would be an option once SOFF had delivered on its current ambition.

As highlighted in a recent study on scaling of development initiatives, SOFF design has all the elements in place to consider scaling up. Its design incorporates the eight principles of effective scaling which the Scaling Community of Practice has established (Linn, J. F., 2022). Two of the principles emphasize adaptation and learning (Principle 7 – Iterate, learn, adapt and sustain the scaling pathway as long as needed and Principle 8 – Base all scaling decisions on relevant evidence and continuous learning). Various interlocutors for this Review emphasized the need for SOFF to learn from its experience and to apply a deliberate but iterative approach to scaling.

4.8 Coherence, complementarity, and leverage

All stakeholders considered that SOFF has a clear role to play within the existing climate finance architecture and as a ‘foundational’ service for additional investments in countries.

4.8.1 Coherence and Complementarity with the global climate finance architecture

Various interviewees highlighted that SOFF had found its niche within the global climate finance architecture and pointed out that it provides the basis to create and make available observation data to improve weather and climate forecasting including for early warning systems. They pointed out that SOFF participation will help countries create a series of climate data so that in future they have an evidence base for their climate change narrative beyond anecdotes. The lack of climate data time series today has a detrimental effect on countries’ ability to access climate finance.

Accordingly, SOFF is considered as coherent with and complementary to the overall climate finance architecture.

Interviewees saw an obvious SOFF role regarding improved weather forecasting combined with the linkage to improved early warning systems which will be increasingly necessary to tackle extreme weather risks due to climate change. There were different opinions regarding countries’ ability to use their successful participation in SOFF to access additional climate finance. Some interviewees considered that the narrative for climate funding is entirely different from the one that SOFF participation can provide while others pointed out that if countries successfully participate in SOFF, then they can attract additional funding with specific national benefits.

Interviewees agreed that SOFF has an important role to play in the context of EW4All. Opinions varied if SOFF should continue to position itself as the foundational pillar 2 for EW4All or if it should become the poster child for EW4All and attract financing for EW4All as a whole. It was broadly acknowledged though that SOFF is highly visible and creating an important platform to strengthen the EW4All Initiative while at the same time increasing its own visibility and relevance in this context.

4.8.2 Mobilization of additional resources for investments in the latter part of the meteorological value chain

Interviewees emphasized that successful participation in SOFF could serve as a foundation for countries to further invest in their meteorological systems. Some observed that the density of GBON is rather low

requiring concerted efforts by countries to secure and amplify investments. Others pointed out that SOFF implementation represents a substantial advancement in data acquisition and modeling abilities. The extensive training by SOFF should not be underestimated; the skills imparted are poised to extend well beyond the program's primary focus. Additionally, some respondents underscored the significance of the overarching global architecture and pointed to the need for international finance institutions to get involved early-on to make bigger amounts of finance available, notably to help build out early warning systems which could then use the data provided through SOFF/GBON. – In sum, there clearly is a vision for mobilization of additional resources and expanding the latter part of the meteorological value chain. This vision was especially evident in discussions with international financing institutions. It appeared, however, that the narrative is not yet entirely shared across stakeholders and that SOFF needs to deliver on both investments and capacity building to show results which then trigger further mobilization.

4.9 Fundraising

Adequate funding will be crucial for SOFF to meet expectations. Given the successful start-up of SOFF – as outlined in earlier sections – there was an expressed willingness from donors to consider additional funding for SOFF. At the same time, a few interviewees highlighted that SOFF will quickly move from the Readiness to the Investment and Compliance Phases and pointed to the urgency of assessing additional funding options now for long-term financial sustainability of the SOFF UN fund. This would include international development and climate finance institutions for potential contributions to SOFF as well as for follow-up investments in the latter part of the value chain not covered by SOFF. National NMHSs could also be enabled to sell their enhanced products to the local private sector. Aviation and tourism would benefit from access to enhanced weather forecasts for their businesses and could be potential partners.

Interviewees generally considered that SOFF would support the EW4All initiative and help it attract financing rather than receiving more financing from the EW4All initiative. A few interviewees expressed that they would consider investments in SOFF (also in the context of EW4All) as part of their contribution for developing countries to avoid/decrease *future* losses and damages due to climate change.

5 Recommendations

5.1 What to do right now

5.1.1 *Organizational Issues and Processes*

➤ Transparency

- Keep going with the excellent communication - website, document sharing and accessibility, workshops and responsiveness.
- Be aware that lower tiers in beneficiary countries NMHSs and operational partner agencies may not get all of the information. Make extra efforts to reach them. Also note that tight deadlines and development of documentation 'along the way' has made for efficient program delivery so far and has been appreciated by most stakeholders, but it may be considered as lack of transparency and efficiency by a few because they feel that goalposts change.
- Clearly communicate to all participants what the current financial resources are. This information is important for investment planning.

- SOFF Secretariat
 - Keep going with the excellent, efficient and effective work.
 - Beware of tension between the much-appreciated ambition vs realism when transitioning into the more complex Investment Phase, notably in terms of tight timelines and deadlines.
- Advisory Board
 - Keep going and “Do not fix what is not broken.” The Advisory Board is a bouncing board for ideas and considered an important part of SOFF’s transparency by sharing information and discussing with a broad group of stakeholders.
- Complexity and capacity
 - Currently SOFF has 62 programmed beneficiary countries, 9 Implementing Entities, 28 Peer Advisor agencies and 12 funders. With more entities, complexity increases. Rather than further expanding the number of Implementing Entities and Peer Advisors, keep this group as is and only at a later stage consider expanding it.
 - Consider further strengthening SOFF Secretariat portfolio management capacity.

5.1.2 *Financing and Fundraising*

- Clearly position SOFF fundraising and contributions to the SOFF UN fund as a foundational investment with tangible global and local benefits for all countries involved. In addition, with adequate funding SOFF serves as an important delivery vehicle of the UN EW4All and as part of donors’ contribution to avoid/decrease future losses and damages due to extreme weather and climate change.
- In terms of future SOFF financial support to beneficiary countries, think of the Compliance Phase arrangements now and develop the framework. Arrangements will need to be in place to direct financial flows to beneficiary countries to deliver on SOFF’s results-based approach.
- Develop clear guidelines regarding SOFF Compliance Phase financial contributions to SIDS, LDCs and MICs. For some SIDS and LDCs the initially envisioned 75% of O&M contributions may not be sufficient, notably when their networks expand due to new GBON requirements. MICs on the other hand also need clear expectations concerning expected Compliance Phase payments.
- Consider hiring a dedicated SOFF communications staff. Few people beyond the SOFF/meteorological community are aware how data hungry weather forecasting is and of the importance of well-functioning global models that feed back to the national and local levels. Reaching a broader audience to understand these linkages would support fundraising.

5.1.3 *Scaling and expansion*

- Show what you can do and SOFF deepening and broadening will follow. “Everybody loves the ambition!”
- Scaling to MICs: expansion to include EW4All countries makes sense, but take into account SOFF implementation experience and financial resources while expanding.
- Scaling up to other earth observation domains incl. oceanic observations, atmospheric composition, hydrology: take sufficient time to get experience and analyze if the current SOFF design works and remain adaptable to adjust what is needed for potential future expansion.

5.2 How to prepare for SOFF's next phases

The Readiness Phase for the first group of countries is concluding, the Investment Phase is about to begin and the Compliance Phase will follow. Therefore SOFF needs to get ahead now with the following recommended steps:

- Explore **regional approaches** so that countries can come together early (e.g. Pacific islands; subregional country clusters in Africa, Caribbean) and achieve economies of scale in issues such as procurement, standardization of equipment and software, mutual back-up, and institutional sharing. Implementing Entities to consider to potentially include regional entities as executing agencies, and the SOFF Secretariat to consider organizing SOFF regional implementation workshops.
- **Procurement** is the key issue to maintain momentum during the Investment Phase. Explore options to speed up procurement, for instance by bundling procurement through one agency rather than by each Implementing Entity. For instance, UNOPS has undertaken procurement on behalf of agencies and countries before in other areas of development.
- **Foster strong relationships** between beneficiary country NHMSs, Peer Advisors and Implementing Entities early on. This creates trust and will enable joint problem solving in future.
- Bring in the **Implementing Entities** as soon as possible already in the Readiness phase in upcoming batches. They need to carry out the Investment Phase with countries and therefore need to be on board with investment approaches. Notably international financial institutions can also mobilize additional finance through their country/regional programming. Peer Advisors and countries would usefully involve them already in current batches where this has not yet been the case.
- Develop the **Compliance Phase framework** to ensure it is in place when the first countries reach that phase and explore how to effectively transfer the money to national agencies.
- Implement the **public/private sector business models** defined in the SOFF Terms of Reference.
- **Long-term SOFF financing** with multiple sources needs to be secured. In the current stages, fundraising from bilateral donors is essential to maintain SOFF momentum, but also develop a plan for financial contributions to the SOFF fund from international funds and foundations.

- **Closely cooperate with the multilateral climate funds** (including Green Climate Fund and CREWS) to seamlessly integrate SOFF with their investments in the downstream meteorological value chain.
- **Enable countries to raise financing** for the latter parts of the value chain, including by involving the private sector once they can provide enhanced forecasting services and products due to SOFF.

References

Linn, Johannes F. "Three Case Studies Applying the Scaling Principle of the Scaling Community of Practice." Scaling Community of Practice. February 2022. <https://www.scalingcommunityofpractice.com/wp-content/uploads/2022/03/Three-Case-Studies-Applying-the-Scaling-Principles.pdf>

SOFF, 2023. Fourth Steering Committee Meeting 30 March 2023. First batch of SOFF Readiness Funding Requests. <https://www.un-soff.org/wp-content/uploads/2023/06/Decision-4.3-First-batch-SOFF-Readiness-funding-requests.pdf>

SOFF, 2023. Fifth Steering Committee 20 -21 June 2023. Second batch of SOFF Readiness Funding Requests. <https://www.un-soff.org/wp-content/uploads/2023/06/Signed-Draft-Decision-5.3-Second-batch-of-SOFF-Readiness-funding-requests.pdf>

SOFF, 2023. Intersessional Steering Committee 19 September 2023. Decision 1.1. Third batch of SOFF Readiness Funding Requests. <https://www.un-soff.org/document/intersessional-decision-1-1-third-batch-ofsoff-readiness-funding-requests/>

SOFF Operational Manual, 2022. <https://www.un-soff.org/document/soff-operations-manual/>

SOFF Terms of Reference, 2021. <https://www.un-soff.org/document/terms-of-reference/>

SOFF Steering Committee decisions and Advisory Board recommendations. <https://www.un-soff.org/document-library/>

List of Figures

Figure 1: Readiness Phase status as of October 15, 2023. Source: SOFF Secretariat

Annex 1

Deep Dive – Country Cases

Introduction

This annex provides an in-depth presentation of four specific cases, shedding light on SOFF's performance in the context of individual countries. These countries, in collaboration with Peer Advisors, are in the final stages of completing their Readiness stage. Although the deep dive cannot yet delve into results, it offers valuable insights into the experiences thus far and provides recommendations for the Investment and Compliance Phases.

The selected cases encompass two SIDSs (Fiji and Maldives) and two LDCs (Mozambique and the United Republic of Tanzania). Each country is partnered with different Peer Advisors (Fiji/Australia; Maldives/Finland and Indonesia; Mozambique/South Africa; and Tanzania/Denmark) and with different Implementing Agencies (Fiji/World Bank; Maldives/UNEP; Mozambique/WFP; and Tanzania/UNDP). These cases offer geographical and institutional diversity and experiences. They build both on the available Readiness Phase documentation for each country and on the in-depth interviews undertaken during this Review. No attributions are made to specific interviewees.

The stated objective of SOFF is to support developing countries, in particular SIDS and LDCs by providing grant financing and technical assistance for the sustained collection and international exchange of surface-based weather and climate observations according to the GBON (Global Basic Observing Network) regulations. SOFF interventions are based on the premise that global weather forecasting systems are only as good as the local observation data that are fed into the global models. Without local data, global models cannot make sufficiently detailed global and local weather and climate predictions. The more countries actively participate in GBON, the better the global models and the better local forecasting in all countries. It is therefore SOFF's mission to help the poorest and the most vulnerable countries close the gaps in the GBON. For this purpose, countries from both the Global South and Global North, UN agencies (notably WMO, UNEP, UNDP as SOFF co-creators, the UN Secretary General's Office, World Food Program, IFAD) and Multilateral Development Banks (AFDB, IADB, World Bank, Islamic Development Bank) have joined forces to support countries in closing this gap by collecting and sharing surface-based weather and climate data to the benefit of developing and developed countries alike.

A successful SOFF program aims to provide sustainable data collections and sharing, enhance global and therewith local modeling, and serve as a foundation for improved weather and climate forecasting. SOFF is in its initial phase, with 62 countries so far programmed for the Readiness Phase. National meteorological agencies from beneficiary countries collaborate with Peer Advisor NMHSs from more advanced countries to assess their readiness to receive long-term investments, implementation support and capacity building through the program. SOFF has been officially integrated into the UN's Early Warning for All (EW4All) initiative, recognizing the critical role of basic weather and climate data in building effective early warning systems.

SOFF's design recognizes that traditional development projects in the hydromet sector often neglect the fact that SIDS and LDCs lack the resources to sustain long-term operation and maintenance costs of infrastructure investments. This often results in a cycle of “build-neglect-rebuild”. By taking a systematic approach and by providing the bulk of O&M financing in the long run, SOFF aims to help countries maintain their investments for both local and global purposes. Countries are incentivized to keep the GBON gap closed since SOFF O&M contributions are only provided if they continue to share their GBON data. This means that forecasting infrastructure must be adequately maintained.

Deep Dive findings

Across the four country cases, there is consensus that SOFF is a **highly relevant** and foundational program at the top of the meteorological value chain, providing significant benefits to participating countries. These benefits extend beyond closing the GBON gap and receiving better data through the global model. SOFF's infrastructure investments (both equipment and software) and capacity building efforts empower countries to improve their forecasting systems beyond GBON. Some interviewees raised concerns about the adequacy of the 200 x 200 km standard density of GBON stations, especially in countries with complex topography. The issue of two-way data sharing was also emphasized, with some interlocutors stressing the importance of accessing and receiving data from the European Centre for Medium-Range Weather Forecasts (ECWMF) to enhance their weather forecasting abilities. While it has already been agreed that SOFF countries will have access to ECMWF data products and training, it would be important that this information be disseminated more broadly by the SOFF Secretariat.

Interviewees universally commended SOFF for its high level of **transparency**. They appreciated the ease of access to and **efficient** service from the SOFF Secretariat, and the availability of data on the SOFF website. Most praised the selection process for Peer Advisors and Implementing Entities. However, some interviewees expressed confusion regarding certain procedures, such as whether the National Contribution Plan had to be signed off by the WMO technical authority and how to determine the correct level of finance to be requested through the National Contribution Plan where some interviewees felt that they had not received sufficient guidance. Interlocutors emphasized however that they considered such issues to be teething problems of a new, innovative program that has adopted a learning-by doing approach and that has been prepared and is being implemented on a much-appreciated fast track.

In terms of **access to climate finance**, various interviewees highlighted the importance of obtaining time series, enabling countries to build the case for climate finance. As one interviewee said “We do this for future generations”. There also was an expectation that if countries can show that they deliver on GBON, then they will be able to make the case for additional assistance in the weather/climate/early warnings field. SOFF participation was considered more crucial for Early Warnings than access to climate finance, possibly due to timing considerations. All four countries had experienced significant adverse weather events in recent times and interviewees were keenly aware of the need to improve the entire Early Warning investment chain and to be prepared for an increase in extreme weather events, both at the forecasting and at the hands-on community level. As one interviewee said “We can't have early warnings without having the data observation network onboard... Otherwise it is 'garbage in- garbage out'.”

Overall, interviewees found SOFF's **design** to be fit-for-purpose. The envisioned 75% support toward O&M costs during the Compliance Phase was deemed sufficient for the GBON gap to be closed in a **sustainable** manner. However, all interlocutors were aware of the substantial costs required to go beyond GBON standard density networks for even better weather forecasting and EW activities. Some saw a trade-off between the 25% percent that countries are expected to cover and the urgency of expanding their national systems. Implementing Entities were already exploring complementary funding options building off of SOFF investments. Additionally, most national agencies highlighted that they had gotten more visibility through SOFF, including at highest political levels. This could be important for future budget allocations, given that traditionally in many countries NMHSs have not received the required attention from finance ministries.

One area of potential improvement in program **effectiveness** is the early integration of NMHSs, Peer Advisors and Implementing Entities. While integration happened organically in some cases, in others, only the national agency and the Peer Advisor worked together with the expectation that the Implementing Entity would join in the Investment Phase. Experience from other programs worldwide suggests that involving all participating entities from the beginning is preferable, especially when certain agencies are expected to take over a portion of the program. Similarly, in the Pacific in particular the suggestion was made that the Secretariat more actively gather all stakeholders involved. There is a need to create economies of scale in a region with high logistics costs on the one hand and where countries traditionally have received many different technologies on the other, without compatibility. SOFF is seen as an opportunity to standardize and make data collection and forecasting more compatible across the region. The same thinking could be considered in other regions, such as the Caribbean, and in sub-regions on other continents. The SOFF Secretariat might consider organizing regional SOFF implementation workshops.

Regarding the **scaling** of SOFF, interviews had mixed views. While they recognized the need for MICs to also benefit from SOFF and the advantages of closing the global GBON gap, they were cautious about the challenges in the upcoming Investment Phase. Currently, it is uncertain if funds pledged so far can cover implementation of all upcoming National Contribution Plans. The prevailing sentiment therefore was for SOFF to approach MIC expansion in a careful and phased approach and to allocate existing resources to the investment funding needs of the currently programmed countries while mobilizing additional resources.

As to **next steps**, procurement was a top priority for most interviewees to maintain SOFF's momentum. Several suggested identifying agencies capable of expeditious procurement and emphasized the urgency of demonstrating results. Additionally, the proposal to explore regional or subregional approaches was mentioned repeatedly to achieve economies of scale in investment, capacity building and future operation and maintenance.

Annex 2

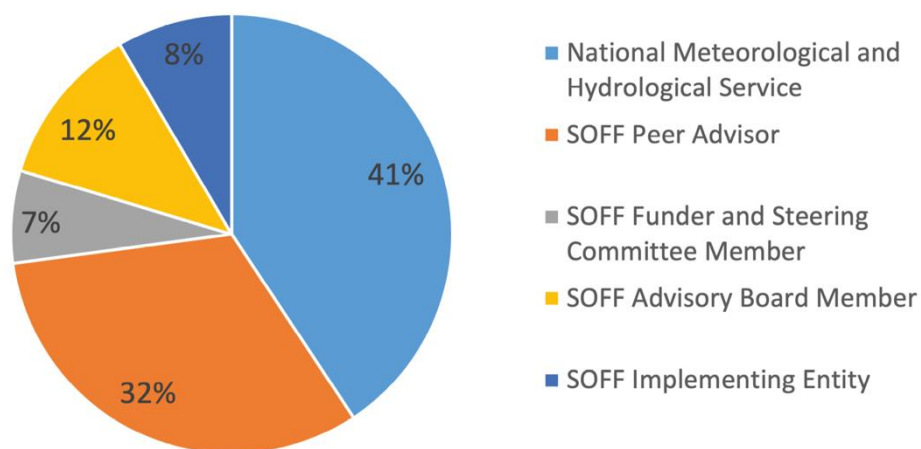
Online Survey Results

1. Introduction

The survey was sent out to 159 SOFF stakeholders, notably the (i) national meteorological and hydrological services in beneficiary countries (54), (ii) SOFF Implementing Entities (17), (iii) SOFF Peer Advisors (31), (iv) SOFF Advisory Board members (32) and (v) SOFF Funder and Steering Committee members (17). The survey was open for participation from August 24 to September 20, 2023.

A total of 59 responses were received, with the following distribution:

SOFF Stakeholder Group Respondents



Survey questions were designed to elicit answers to the aspects analyzed in this Review, notably:

- Relevance of SOFF for global and national weather and climate observations
- Efficiency (SOFF design and institutional set-up)
- Effectiveness (SOFF design and institutional set-up, including early impact)
- Sustainability (SOFF design)
- Transparency (SOFF processes and documentation)
- Scalability
- Coherence, complementarity, and leverage (SOFF within the climate finance architecture and SOFF contribution to mobilization of additional resources for investments in the latter part of the meteorological value chain)
- Fundraising (closing the SOFF funding gap, including as part of EW4All initiative and as part of the Loss & Damage funding arrangements)

The first 8 questions were targeted at all Survey respondents. The remaining questions were targeted at subgroups and administered to each stakeholder group separately to achieve more granularity.

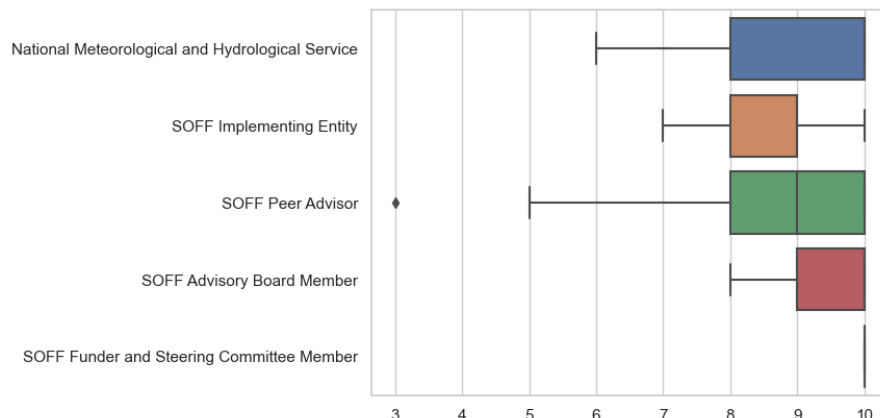
A few caveats:

1. Emails were sent out to representatives nominated by the stakeholder groups. There were more potential respondents per stakeholder group than there are agencies. For instance, there are 9 Implementing Entities in SOFF, but the survey was sent out to 17 stakeholders within this group.
2. In Question 8, respondents were asked which stakeholder group they belonged to. Some agencies have dual roles (e.g. some Steering Committee members also represent Implementing Entities). Because the survey was anonymous, it is not possible to say which role specific members chose. The numbers of each stakeholder group given here do therefore not correspond exactly to the number of agencies, but rather to the number of individual stakeholders involved.
3. The results shown here are therefore indicative of each group's overall assessment rather than precise measurements. The survey needs to be seen in context of the in-depth interviews, as presented in the main text of this Review.

2. Survey Results – Questions 1 to 8 – All Stakeholders³

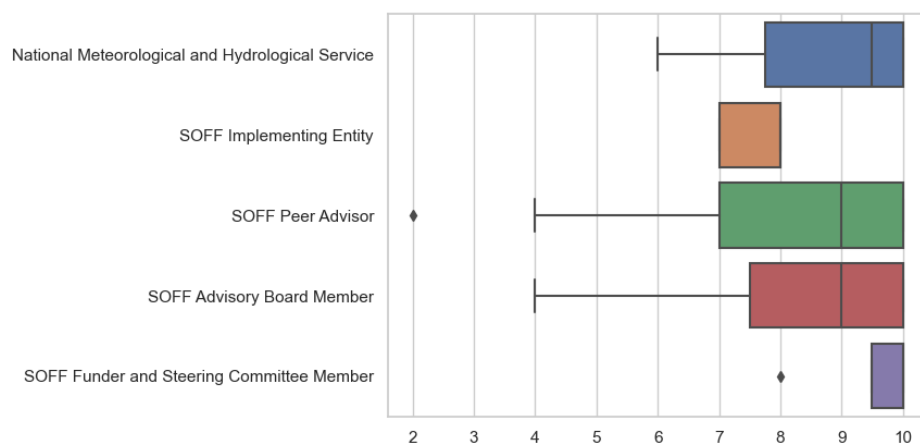
Question 1 – all stakeholders:

How relevant is SOFF for the improvement of weather forecasting globally and in your country/the countries you are supporting through SOFF?



Question 2 – all stakeholders:

How relevant is SOFF for climate adaptation globally and in your country/the country(ies) you are supporting through SOFF?

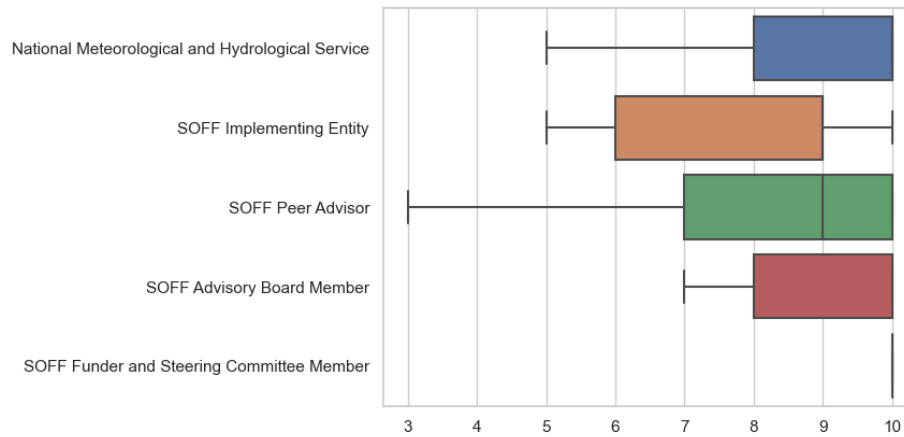


³ How to read the box plots:

- The minimum (the smallest number in the data set): The minimum is shown at the far left of the chart, at the end of the left “whisker.”
- First quartile, Q₁, is the far left of the box (or the far right of the left whisker).
- The median is shown as a line in the center of the box.
- Third quartile, Q₃, shown at the far right of the box (at the far left of the right whisker).
- The maximum (the largest number in the data set), shown at the far right of the box.
- The diamonds are outliers.
- The boxes therefore indicate where 50% of the answers are.

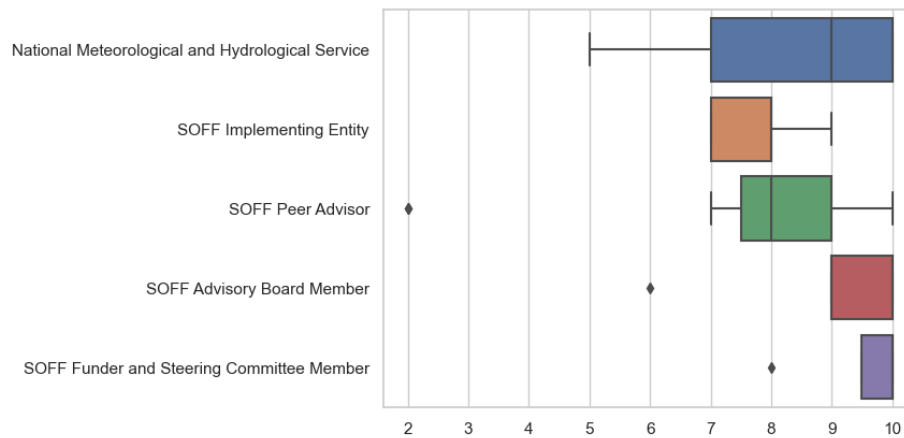
Question 3 – all stakeholders:

How relevant is SOFF for the UN Early Warnings for All initiative to achieve its target to protect everybody on this planet with early warnings by 2027?



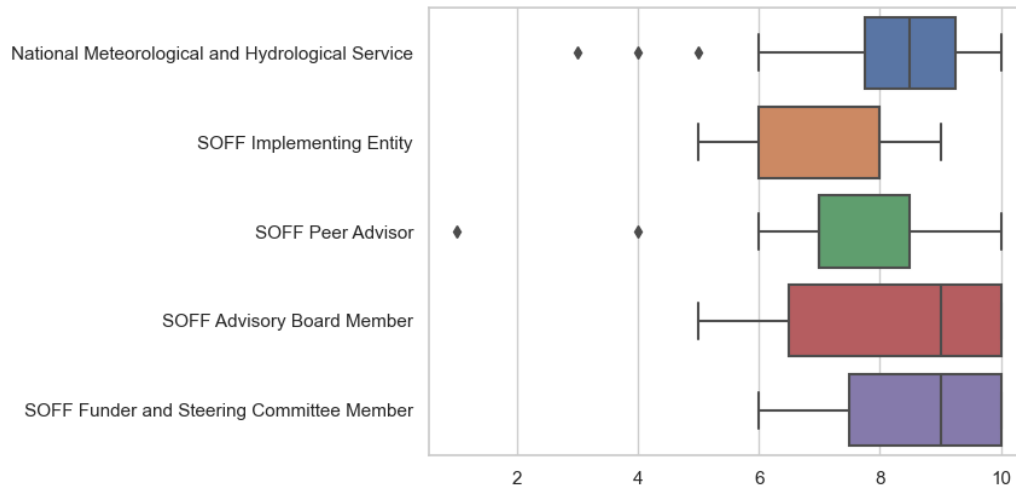
Question 4 – all stakeholders:

How effective is the SOFF Secretariat in executing its role?



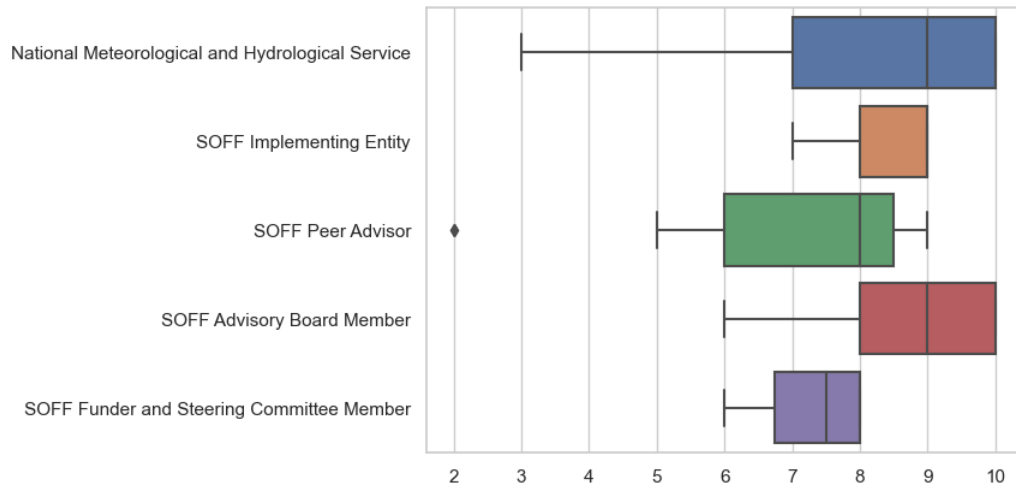
Question 5 – all stakeholders

How well does SOFF design tackle the issue of sustainability of investments in observation infrastructure?



Question 6 – all stakeholders

How transparent do you consider access to SOFF funding?



3. Survey Results - National meteorological and hydrological services in beneficiary countries

■ very negative rated 1-2
 ■ negative rated 3-4
 ■ average rated 5-6
 ■ positive rated 7-8
 ■ very positive rated 9-10

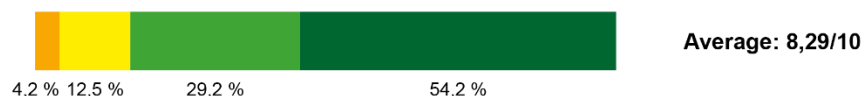
How easy has it been for your organization/country to access SOFF support in the Readiness phase?



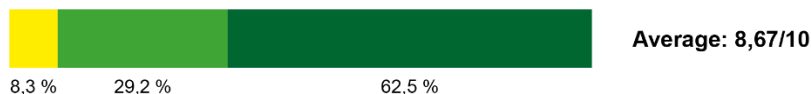
How smooth has the process been to set up the readiness work with the peer and prospective Implementing Entity that you are working with?



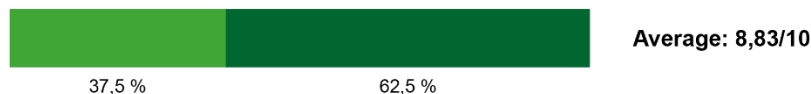
Will SOFF implementation, i.e. filling the GBON gap in your country, make your weather and climate forecasts more reliable?



How would you consider the quality of the readiness support you have received from the peer advisor(s) so far?



Is the peer support process supporting your organization's goals within SOFF?



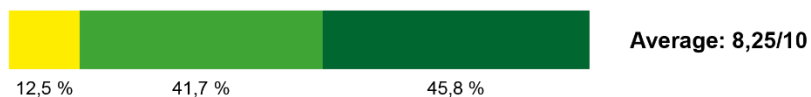
Does SOFF support adequately address the institutional barriers to closing the GBON gap and the long-term international exchange of data?



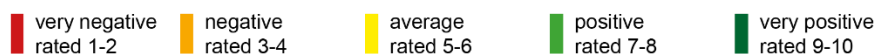
Does SOFF support adequately address the financial barriers to closing the GBON gap and the long-term international exchange of data?



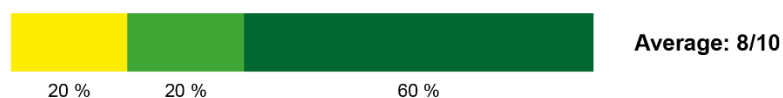
Is your participation in SOFF giving you increased visibility and importance within the country with climate-relevant institutions and processes?



4. Survey Results - SOFF Implementing Entities



How easy has it been for your institution to become an active SOFF partner in the Readiness phase?



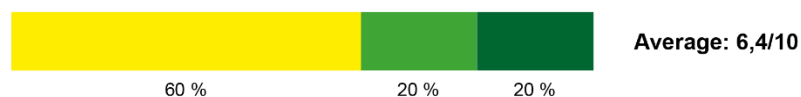
Will SOFF implementation in the country/ies you support make weather and climate forecasts more reliable?



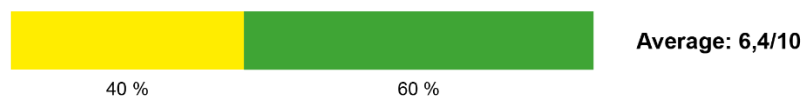
Does SOFF participation provide the appropriate incentives for beneficiary countries to share data regionally and globally?



How effectively have you been able to incorporate SOFF components in broader projects/programs that your organization has supported?



Has participation in the SOFF process influenced the way your organization designs weather and climate projects/programs?



Does SOFF support address the barriers to close the GBON gap in a sustained manner?



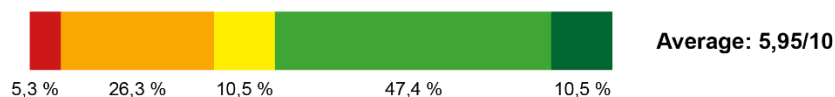
How important is SOFF support in the context of delivering on the global Climate agenda, including Loss and Damage?



5. Survey Results – SOFF Peer Advisors

■ very negative rated 1-2
 ■ negative rated 3-4
 ■ average rated 5-6
 ■ positive rated 7-8
 ■ very positive rated 9-10

How smooth has the process been to set up the readiness work with the country met office that you are supporting to start up the peer process?



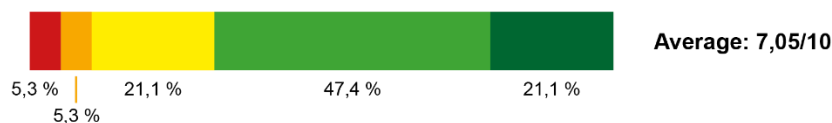
How do you rate the long-term institutional sustainability of SOFF investment for the country you are supporting?



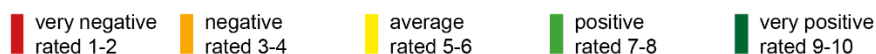
How do you rate the long-term financial sustainability of SOFF investment for the country you are supporting?



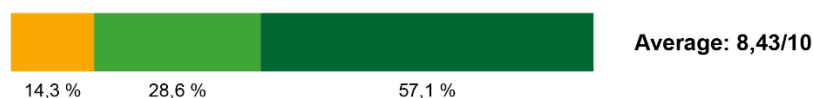
Do you consider that SOFF provides sufficient incentives for the country met offices to close the GBON gap in a sustained manner?



6. Survey Results – SOFF Advisory Board Members



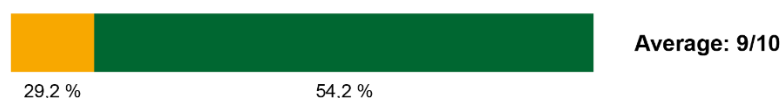
How important is SOFF support in the context of delivering on the global Climate agenda, including Loss and Damage?



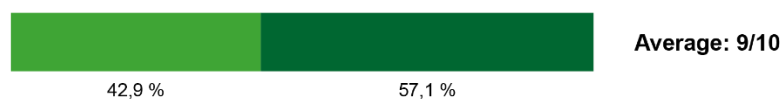
How important is the expansion of SOFF to Middle Income Countries for SOFF's role within the climate finance architecture?



How important is SOFF to foster coherence and alignment of climate finance support to beneficiary countries?



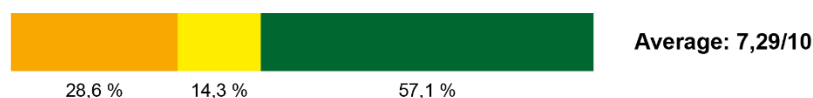
How efficiently has SOFF made decisions to advance its objective to "support Small Island Developing States (SIDS) and Least Developed Countries (LDCs) by providing grant financing and technical assistance for the sustained collection and international exchange of surface-based weather and climate observations according to the GBON regulations."?



How effective has the Advisory Board been in supporting the work of the SOFF Steering Committee and its decision making?

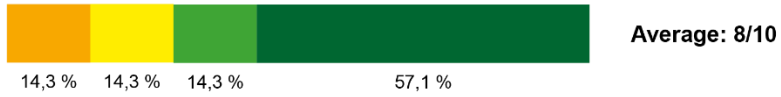


How important is SOFF for your organization's interventions in the latter part of the value chain in beneficiary countries?

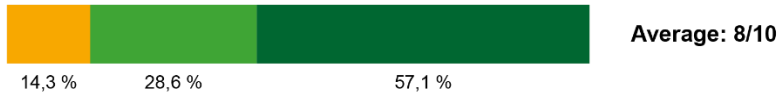


■ very negative rated 1-2
 ■ negative rated 3-4
 ■ average rated 5-6
 ■ positive rated 7-8
 ■ very positive rated 9-10

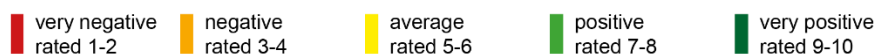
How do you rate SOFF design and implementation in terms of long-term sustainability of the investments that SOFF is making?



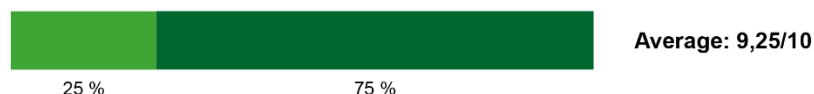
Do you consider that SOFF provides sufficient incentives for the country met offices to to close the GBON gap in a sustained manner?



7. Survey Results – SOFF Funder and Steering Committee Members



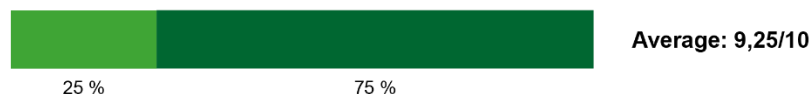
How important is SOFF support in the context of delivering on the global Climate agenda, including Loss and Damage?



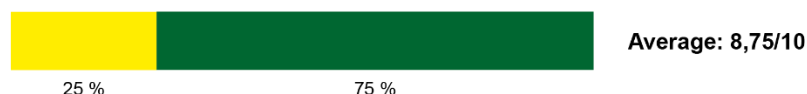
How important is SOFF to foster coherence and alignment of climate finance support to beneficiary countries?



How efficiently has SOFF made decisions to advance its objective to "support Small Island Developing States (SIDS) and Least Developed Countries (LDCs) by providing grant financing and technical assistance for the sustained collection and international exchange of surface-based weather and climate observations according to the GBON regulations."?



How effective has the Advisory Board been in supporting the work of SOFF Steering Committee members?



Do you consider that SOFF provides sufficient incentives for the country met offices to close the GBON gap in a sustained manner?



How do you rate the long-term sustainability of SOFF design and implementation for the beneficiary countries?



Annex 3

Stakeholders Interviewed

| Name | Role | |
|-------------------------------|--|---|
| Ambassador Carlos Fuller | Ambassador and PR, Permanent Mission of Belize to the United Nations. Represented AOSIS on several occasions | Advisory Board (former) |
| Markus Repnik | Director | SOFF Secretariat |
| James Kinyangi | Chief, Climate and Policy – African Development Bank (AfDB) | Implementing Entity |
| Dr Ladislaus Benedict CHANG'A | Acting Director General Tanzania Meteorological Agency (TMA) | Beneficiary country - Tanzania |
| Pekka Utela | HMEI Vaisala Head of Application Management, Remote Sensing | Advisory Board, private sector representative |
| Johannes Linn | Global Facilitator | SOFF Secretariat |
| Laura Tuck | Global Facilitator | SOFF Secretariat |
| Anthony Rea | Former director WMO Infrastructure, SC co-chair, SOFF secretariat administratively reporting to him | WMO Management |
| Ming Zhang | Practice Manager, Urban, Resilience & Land: The World Bank, East and Asia Pacific | Implementing Entity, Fiji |
| Rob Braaten | Data Requirements & Planning Manager, Data & Digital Group Australian Bureau of Meteorology | Peer Advisor - Fiji |
| Ahmed Rasheed | On behalf of Mr. Abdulla Wahid, the PR of Maldives | Beneficiary Country NMHS |
| Benjamin Laroquette | Global Advisor Early Warning Systems/Climate Information and Regional Technical Advisor-Climate Change Adaptation Climate Hub. UNDP focal point operations Tanzania | Implementing Entity |
| Jochem Zoetlief | Head, Climate Services and Capacity Building Unit, Early Warning and Assessment Division; | Implementing Entity |

| | | |
|--|---|-----------------------------|
| | UNEP representative in SC | |
| Andreas Schaffhauser | General Director, Austrian met office Geosphere Austria | Peer Advisor |
| Christian Robdrup Johansen | Practice Manager, SOFF and Strategic Sector Cooperation, Danish Meteorological Institute (DMI) | Peer Advisor, Tanzania |
| Harri Pietarila | Director of Expert Services, Finnish Meteorological Institute (FMI) | Peer Advisor |
| Amanda McCarthy | Senior Advisor, Office of the Special Presidential Envoy for Climate; Represents US in SC | Steering Committee |
| Leonard Bale on behalf of Terry Atalifo | Fiji Meteorological Service on behalf of Terry Atalifo (Acting Director Fiji Meteorological Service) | Beneficiary Country -Fiji |
| Srilata Kamila | Head, Climate Change Adaptation, Bureau for Policy and Programme Support; UNDP co-chair to the AB | Advisory Board |
| Aage Joergensen | Head of Portfolio Origination & Management a.i., Nordic Development Fund (NDF) and Steering Committee co-chair | Steering Committee |
| Jesse Mason | Global Coordinator Anticipatory Actions & Climate Services · World Food Programme – Mozambique IE | Implementing Agency |
| Ousmane Ndiaye | Director National Meteorological Service Senegal. Represents LDC group at SC meetings | Steering Committee |
| Francis Pigeon | Executive Director, Policy and Partnerships, Meteorological Service of Canada/Environment and Climate Change Canada | Steering Committee observer |
| Karin Issakson | Managing Director, Nordic Development Fund (NDF) | Steering Committee |
| Albert Fischer | Director, WMO Integrated Global Observing System | WMO Management |
| Mr. Moegamat Ishaam ABADER | Permanent Representative of South Africa to WMO and CEO of South African Weather Service | Peer Advisor Mozambique |

| | | |
|---------------------------------------|---|---------------------|
| Arun Jacob (on behalf of Selwin Hart) | Senior Advisor, Climate Action Team, Executive Office of the Secretary General | Steering Committee |
| Florian Pappenberger | Deputy Director-General & Director of Forecasts; ECMWF | Advisory Board |
| Dr Adérito Celso Félix ARAMUGE | Director General, National Meteorological Institute (INAM), Mozambique | Beneficiary Country |
| Yohannes Kesete | Senior Disaster Risk Management Specialist; World Bank team leader for Africa regional IDA resilience program | Implementing Entity |