

# SOFF Readiness Funding Request

Systematic Observations Financing Facility

Weather and climate data for resilience



## **SOFF Readiness Funding Request**

The SOFF Readiness Funding Request template includes the following sections:

- 1. Basic information
- 2. SOFF Programming criteria
- 3. Readiness phase outputs, timeline and budget
- 4. Monitoring
- 5. Readiness Phase Risk Management Framework

The Assignment Terms of Reference are included in Annex 1.



### 1. Basic information

SOFF Beneficiary Country	Nepal
Country Focal Point	Mr. Kamal Ram Joshi,
	Director General, Department of Hydrology and
	Meteorology, PR to WMO,
	mobile +9779841282557, email: joshikamalram@gmail.com
Peer advisor	Finnish Meteorological Institute (FMI)
Peer advisor Focal Point	Ms. Jenni Latikka,
	mobile: +358504532163, email: jenni.latikka@fmi.fi
Prospective Implementing Entity	UNEP
Prospective Implementing	Mr. Jochem Zoetelief,
Entity Focal Point	mobile: +254709023986, email: jochem.zoetelief@un.org
Total budget USD	86 000 \$
Delivery timeframe	6 months after approval of funding request
Date of approval	
Signature SOFF Steering Com funding request)	nittee co-chairs (after Steering Committee approval of the



## 2. SOFF Programming criteria

#### Table 1: Programming criteria

Close the most significant data gaps	Nepal covers about 147 000 km <sup>2</sup> with average width of 193 km and average length of 885 km. DHM is operating 17 GBON surface stations (called aero- synop stations) and one upper-air station. Maximum distance between GBON surface stations is about 150 km fulfilling GBON regulation on horizontal resolution. Observations at all aero-synop stations are produced both, manually and automatically. Observation interval of automatic stations is 10 minutes. For manual stations observation interval is 30 minutes (METAR) in all aero-synop stations and 3 hours (SYNOP) in all synoptic stations between 00–12 UTC except Kathmandu airport where observations are made 24 hrs per day. Currently DHM is reporting observations from Kathmandu airport to the GTS/WIS in 3-hour interval and from other stations at 00–12 UTC due to working hours of manual observers and lack of real-time data transmission. This doesn't fulfil the temporal resolution of GBON. Stations are measuring pressure, temperature, humidity, precipitation, wind speed and direction etc. Snow depth is not measured at these stations. Also, GBON stations over 3000 m are very limited. DHM is producing upper-air soundings at Kirtipur, Kathmandu. Sounding observations are containing temperature, humidity and wind measurements at different pressure levels with minimum of 100 m vertical resolution up to 30 hPa level. This complies with the GBON requirements. Soundings are made once a day due to budgetary reasons. DHM does not disseminate sounding data to the GTS/WIS system due problems to register station to OSCAR and to transmission problems in suitable format to the GTS/WIS. Spatial requirement of upper-air soundings does not cover western Nepal. Nearby stations in west
	locates at Lucknow and Gorakhpur, India, but temporal resolution of those stations does not fulfil GBON requirements.
Target easy fixes	Main gap in fulfilling the GBON requirements in Nepal is the temporal resolution of data and data transmission problems. This means that the communication system from station and data management system (DMS) to WMO regional communication centre should be strengthened, and manual observations should be replaced or complemented by automatic ones. This might need further development of DMS. In addition, especially funding of upper-air observations equipment (balloons and radiosondes) should be supported to increase number of daily soundings to required level and establishment of another sounding station to western Nepal should be studied.



	Other easy fixes to meet GBON requirements in future is to support operational and maintenance expenses in the current uncertain governmental funding situation, develop communication from stations to DMS and invest to better quality sensors at some stations. These needs would be specified more accurately during readiness phase. Sustainability of SOFF investments and quality of observations could be improved by providing further training for calibration, maintenance and repair of observation stations, and data management system.
Maximize delivery capacity	Peer Advisor has a long-lasting and extensive experience working in Nepal and DHM thought multiple development projects. FMI has co-operated continuously with DHM since 2010 in three capacity building projects (FNEP1–3) funded by Ministry of Foreign Affairs for Finland (MFA) and working as System Integrator in World Bank funded project <i>Building</i> <i>Resilience to Climate-Related Hazards (BRCH, 2012–2021)</i> including full modernization of the DHM infrastructure like observations and DMS. Based on the close co-operation they have an extensive knowledge in all fields needed for the successful implementation in institutional, procedural areas and human resources in accordance with the different phase of SOFF. Through the knowledge of existing systems as well issues, organizational and institutional arrangements, and procedures, gained by the close cooperation, the efficiency and effectiveness will be maximized when delivering the services through all the phases of SOFF.
	project in March 2023. Implementing entity has extensive experience related to implementing projects on climate information and Early Warning Systems that will enable it to deliver SOFF support efficiently and effectively in the country. For example, UNEP is currently working on implementing a GCF-funded 5-year project "Enhancing Early Warning Systems to build greater resilience to hydro- meteorological hazards in Timor-Leste" and a GCF-funded 5-year programme "Enhancing Climate Information and Knowledge Services for resilience in 5 island countries of the Pacific Ocean" where strengthening observational capacity is one of the key components. UNEP is also co-leading Pillar 2 of Early Warnings for All Initiative (Observations & Forecasting). UNEP capacity to deliver SOFF support efficiently in Nepal is strengthened through its partnership with Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES), which prepared a <u>5-year capacity</u> development programme for early warning systems.



Create leverage	World Bank funded BRCH consisted full modernization of DHM including procurement and commissioning of total 88 new automatic weather stations (AWS), establishment of calibration laboratory and the first upper-air sounding system to Kathmandu in addition to enhanced data management system. Stations installed to existing climatological (manual) or AWS stations to improve quality of observations, number of weather parameters and real- time data transmission to database. DMS included previously missing features, like handling of various types of data and messages, real-time quality control, improved database, network information management and data delivery module.
	DHM has proposed two international development projects. WB funded CARE South-Asia and USAID funded regional program. CARE South-Asia is focusing institutional policy matters, verification of numerical weather prediction system and development of impact-based forecast of floods at one river basin. USAID funded "Strengthening last mile communication in South Asia Region" focusing on monitoring of floods and landslides at two river basins.
	As an accredited entity to GCF, UNEP could work in the future to raise GCF funding to further strengthen hydrometeorological capacity in Nepal based on the needs identified through Country Hydromet Diagnostics. If desired by the country, UNEP will also leverage its existing partnerships such as with the Regional Integrated Multi-Hazard Early Warning System (RIMES).
Sub- regional gains	As a member state, Nepal has exchanging historical data with Regional Integrated Multi-Hazard Early Warning System for Asia and Africa (RIMES). Strengthening observational capacity in Nepal will enable it to provide real time data to RIMES. This data will then be shared with all other member states, which will lead to sub-regional gains.
Ensure country balance	Nepal is an ODA-recipient country, categorized in the group of least developed countries (LDC)

#### 3. Readiness phase outputs, timeline and budget

The Terms of Reference for the development of the SOFF Readiness phase outputs (see Annex I) provide more detailed information. They also summarize the roles and responsibilities, as stated in the <u>SOFF Operational Manual</u>, of the beneficiary country, the peer advisor, the prospective Implementing Entity and WMO Technical Authority for the delivery of the Readiness phase outputs.



The budget for the development of the SOFF Readiness phase outputs by the SOFF peer advisor shall be a lump-sum, fixed cost amount. It shall be calculated using a cost-recovery approach based on the peer advisors' standard cost recovery rates.

Table	2:	outputs.	timeline	and	budget
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Outpute	Timeline					
Outputs	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6 <sup>1</sup>
National GBON Gap Analysis						
GBON National Contribution Plan						
Country Hydromet Diagnostic (on demand)						
Total budget USD <sup>2</sup>	86 000					

#### 4. Monitoring

The beneficiary country and peer advisor shall notify the SOFF Secretariat on any delays that may impede the timely delivery of the Readiness phase outputs. If the assignment takes more than six months, the SOFF peer advisor shall submit semi-annual progress reports to the SOFF Secretariat (form to be provided by the SOFF Secretariat) stating the delivery status of the outputs.

The Readiness phase completion will be monitored by the peer advisor and the SOFF Secretariat using the following country-level Results Framework for the Readiness phase.

<sup>&</sup>lt;sup>1</sup> It is expected that the assignment is completed within six months. If more time is required for exceptional circumstances, please add additional months to the table.

<sup>&</sup>lt;sup>2</sup> Eligible expenditures are limited to: Staff and consultants; Consultations, national technical workshops, and communications; Travel and transportation costs; Other incidental expenditures.



#### Table 3: Result framework

Outputs	Indicator	Target
1. GBON National Gap Analysis	GBON gap established and reviewed (Y/N)	GBON gap analysed and reviewed by WMO Technical Authority
2. GBON National Contribution Plan	GBON national contribution plan developed (Y/N)	GBON national contribution plan developed and reviewed by WMO Technical Authority
	GBON National Contribution Plan includes gender considerations (Y/N)	GBON National Contribution Plan includes gender considerations
3. Country Hydromet Diagnostic (on demand)	Country Hydromet Diagnostic developed (Y/N)	Country Hydromet Diagnostic developed

#### 5. Evaluation

An evaluation from both, the beneficiary country and the prospective Implementing Entity on the quality of support received by the peer advisor will be conducted at the end of the Readiness phase and the peer advisor's assignment (form to be provided upon completion of the Readiness phase by the SOFF Secretariat).

#### 6. Readiness Phase Risk Management Framework

The major risks in the implementation of the readiness phase are related to the natural disasters or global pandemics and related travel restrictions. These may cause delay in the implementation. Moreover, the adequacy of the beneficiary staff resources to support the implementation forms risks to producing the needed reports

Risk category	Description	Probability	Mitigation action
<b>Contextual risks</b> Risks related to conflicts, safety and political insecurity jeopardizing the delivery of the Readiness phase outputs	The Covid-19 situation or new pandemic may cause delays in the project	Medium	New deterioration of the situation or completely new pandemic are possible. This risk will be mitigated by monitoring the situation as well as activity scheduling measures. In addition, remote activities shall be considered in case the situation requires.

	Table 4:	Risk	Management	Framework
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	Political crisis leading to sudden deterioration of the public safety in Nepal	Low	The safety situation will be monitored actively with the DHM and support of Embassy
	Natural disaster such as earthquakes may cause delay	Low - Medium	Remote activities shall be considered in case the situation requires.
	Major flooding, earthquake etc. could hinder the DHM staff to focus and participate in project activities and/or impact the actual functioning of DHM	High	Flooding and landslides are common during monsoon season why project activities avoid main monsoon season. The project will encourage
	Organizational changes	Medium	close co-operation between divisions and sections and them to remain in.
Institutional risks Risks related to the beneficiary country's institutions participation in the Readiness phase activities	Other projects and duties at the DHM involve same experts	Low	Currently DHM has only few projects, but personnel are involved to wide range of internal tasks. Early planning of project activities prepares DHM to release personnel to the project. Also, timely information exchange between projects is needed
	DHM moved under another Ministry or unstable political situation	Medium	The project cannot control this issue, but the possible change may affect to timetable. Up- to-date information sharing between partners on situation is important for project implementation.
<b>Programmatic risks</b> Risks related to country ownership of the	Limited human resources and capacity of competent DHM staff, changes of personnel	Medium	Training is provided to the wider group of DHM experts, technical guidance documents (SOP) and training materials are prepared and used to train new staff.
Readiness phase outputs	Problems in technical systems	High	Repair and problem solving should be noted in the plans



## Annex 1. Assignment Terms of Reference for the development of the SOFF Readiness phase outputs

#### 1. Purpose and scope

The purpose of this Assignment is to provide SOFF peer advisory services by Finnish Meteorological Institute to Nepal to develop the outputs of the SOFF Readiness phase as described in section 3 of these Terms of Reference.

The provisions defined in the Terms of Reference are based on the <u>SOFF Operational Manual</u>, in particular Section 4.4 on Operational Partners and Section 4.5.1 on the Readiness phase.

#### 2. Roles and responsibilities

#### Beneficiary country National Meteorological and Hydrological Service

- Is responsible for implementing the activities of the Readiness phase with the support from the peer advisor and the prospective Implementing Entity.
- Prepares the Assignment Terms of Reference following the standard Terms of Reference provided by the SOFF Secretariat, in collaboration with the peer advisor and in coordination with the prospective Implementing Entity.
- Submits the funding request for the SOFF Readiness phase support using the standardized template provided by the SOFF Secretariat.
- Is responsible for collaborating with the peer advisor to provide all the necessary information and participate in and facilitate the national activities the peer advisor needs to conduct in order to develop the Readiness phase outputs.
- Confirms receipt of the peer advisors' report with the Readiness phase outputs and provides comments on the outputs as needed.

#### Peer advisor

- Is accountable to the beneficiary country.
- In dialogue with the beneficiary country, provides independent technical advice, analysis and recommendations to support the beneficiary country in implementing the activities of the Readiness phase.
- Develops the Readiness phase outputs and is responsible for their quality and timely delivery. Communicates regularly with the beneficiary country and the Implementing Entity.
- Engages with the civil society, including on the identification of stakeholders of relevance for GBON implementation.
- Submits the final report with the Readiness phase outputs to the country for comments and to the prospective Implementing Entity for feedback.
- Submits the final report including the beneficiary country's comments and the prospective Implementing Entity's feedback to the SOFF Secretariat.



• Notifies the SOFF Secretariat and the prospective Implementing Entity of any delays that may impede the timely delivery of the outputs, and for assignments for which the delivery takes more than six months submits a semi-annual progress report.

#### **Implementing Entity**

- Participates in the Readiness phase activities and collaborates with the beneficiary country and the peer advisor to ensure a common understanding of the Readiness phase outputs and that they address the technical needs for the design and implementation of the Investment phase.
- Contributes to the definition of the Terms of Reference and provides feedback on the outputs delivered by the peer advisor.
- Based on its experience in the beneficiary country, supports the work of the peer advisor, e.g. by sharing its knowledge and facilitating access to the network of relevant stakeholders.

#### WMO Technical Authority

- Provides basic technical support to the beneficiary country, peer advisor, and prospective Implementing Entity on GBON regulations.
- Is responsible for the technical screening of the draft GBON National Gap Analysis and the draft GBON National Contribution Plan against the GBON regulations.
- Is responsible for establishing and administering the pass-through mechanism for contracting and funding of the technical assistance provided by the peer advisors.

#### **SOFF Secretariat**

- Facilitates communication, coordination and collaboration between the beneficiary country, the peer advisor, the prospective Implementing Entity and WMO Technical Authority.
- Reviews the Readiness funding request, including the Terms of Reference, for compliance and consistency with the information requirements in the template and provides feedback as needed. Transmits the funding request to the SOFF Steering Committee for its decision.
- Confirms receipt of the peer advisors' report with the Readiness phase outputs.
- Organizes exchange of knowledge and experiences and captures lessons learned.

#### 3. Readiness phase outputs

The peer advisor should perform the following tasks following the technical guidance and using the templates provided in the <u>operational guidance documents</u> for each one of the outputs. A summary of the key steps and modules to be conducted for each output is presented below.



#### **3.1 GBON National Gap Analysis**

The GBON National Gap Analysis defines the gap between the mandatory requirements of the GBON regulations and the existing country surface and upper-air networks. In other words, it serves as the basis for identifying the number of observing stations that need to be installed or rehabilitated to comply with the mandatory requirements of the GBON regulations.

To develop the GBON National Gap Analysis, the following steps should be followed

- **Step 1** Country information from the GBON Global Gap Analysis
- **Step 2** Analysis of existing GBON stations and their status against GBON requirements
- Step 3 GBON Gap Analysis results
- **Step 4** Country endorsement for integration of the GBON National Gap Analysis into the GBON National Contribution Plan

#### **3.2 GBON National Contribution Plan**

The GBON National Contribution Plan identifies the infrastructure, human and institutional capacity needed to achieve a progressive target toward GBON compliance, including the sustained operation and maintenance of the national GBON observing network.

To develop the GBON National Contribution Plan, the following modules should be completed

- **Module 1. National target toward GBON compliance:** Establishment of a progressive national target toward GBON compliance
- **Module 2. GBON business model and institutional development**: public-private business model as appropriate; partnerships, institutional and financial arrangements needed to operate and maintain the observing network
- **Module 3. GBON infrastructure development**: Appropriate investments needed to increase or improve the observing network and its Information and Communication Technology (ICT) infrastructure
- **Module 4. GBON human capacity development**: Human technical and managerial capacities required to operate and maintain the observing network
- **Module 5. Risk Management:** Operational risks of the observing network and required mitigation measures
- **Module 6. Transition to SOFF Investment phase:** Support the beneficiary country and the Implementing Entity in preparing the Investment phase funding request (template provided by the SOFF Secretariat).

#### **3.3 Country Hydromet Diagnostics**

The Country Hydromet Diagnostic (CHD) complements the GBON National Gap Analysis and the GBON National Contribution Plan. It is a standardized, integrated and operational tool and approach for diagnosing National Meteorological Services across the meteorological value chain, their operating environment, and their contribution to high-quality weather,



climate, hydrological and environmental information services and warnings. Its assessment serves as a basis for investments beyond SOFF, across the whole value chain, by the SOFF Implementing Entity and other development partners.

The peer advisor should **assess the 10 CHD elements** with its respective indicators following the matrix provided in the CHD guidance document.

- Governance and institutional setting
- Effective partnerships to improve service delivery
- Observational infrastructure
- Data and product management and sharing policies
- Numerical model and forecasting tool application
- Warning and advisory services
- Contribution to climate services
- Contribution to hydrological services
- Product dissemination and outreach
- Use and national value of products and services

To develop the Country Hydromet Diagnostic, the following **steps** should be completed.

- Stage 1 Information gathering. As input, the WMO Monitoring Evaluation Risk and Performance unit will provide available country data structured along the CHD elements and their indicators (performed remotely)
- Stage 2 Validation and analysis (performed in-country if feasible)
- Stage 3 Closure

#### 4. Delivery process

The peer advisor in collaboration with the beneficiary country and in coordination with the prospective Implementing Entity should establish the specific activities and consultations needed to complete the outputs. The development of the outputs should include the following:

- Collaboration arrangements between the beneficiary country and the peer advisor, including at least one country visit, unless the country context does not allow it. *Mission on detail GAP Analysis and GBON National Contribution Plan is preliminary planned for May 2023. Second mission on GBON National Contribution Plan finalization and Country Hydromet Diagnosis will be organized on second half of 2023. Remote follow-up meetings will be organized regularly (once per week) during active document preparation period or when necessary.*
- Coordination arrangements with the prospective Implementing Entity Follow-up meetings will be organized remotely once per month or when necessary



• In-person or virtual consultation meetings with relevant national and international stakeholders and partners DHM's stakeholders, like Ministry of Energy, Water Resources and Irrigation, Ministry of

Finance, Civil Aviation Authority of Nepal, Nepal Agriculture Research Council, Department of Health Services, Real Time Solutions Ltd, WMO Regional Centres

- Delivery partners that support the peer advisor in the delivery of the outputs, as applicable *None*
- Peer advisor delivery team and focal point

The peer advisor focal point is:

Ms. Jenni Latikka (Forecast production and service delivery) (jenni.latikka@fmi.fi; +358 50 45 32 163)

And the delivery team members are:

*Mr. Matti Eerikäinen (Data management, forecasting and production systems, service delivery)* 

Mr. Sami Kiesiläinen (Data management systems)

In addition to the dedicated delivery team members, the peer advisor will utilize experts from the SOFF delivery support expert pool, depending on the gaps found and required expertise needed. The SOFF delivery support expert pool:

Name	Expertize		
Mikä Hyötylä	Surface observation networks		
Vilma Kangasaho	Surface observation networks		
Anu Petäjä	Observation network operation and costing		
Timo Laine	Upper air radio soundings		
Jaakko Siltakoski	Observation equipment		
Elmeri Nurmi	Data management systems		
Minna Huuskonen	GBON and WIGOS compliance		
Janne Kauhanen	Data management		
	Forecast models		
	Strategic planning, business model and		
Harri Pietarila	organization		
	Legal framework		
Julia Warley	Observation equipment		
Anne Hirsikko	Observation networks		
	Business model and institutional development		
Juhana Hyrkkänen	Legal framework		
,	Observation network operation design		



- Timeline for the development of the outputs
  - National GBON Gap Analysis: during the implementation months 1-3. The gap analysis report will be handed over by the end of the month 3.
  - National GBON Contribution Plan: during the implementation months 2-6. The National GBON Contribution Plan will be handed over the latest during the month 6.
  - Country Hydromet Diagnostic: during the implementation months 3-6. The Country Hydromet Diagnostic will be handed over the latest during the month 6.

#### 5. Reporting and completion

**Reporting.** For assignments for which the delivery of advisory services takes more than six months, the SOFF peer advisor shall submit a semi-annual progress report to the SOFF Secretariat (form to be provided by the SOFF Secretariat).

#### Completion

- **Step 1.** The peer advisor submits the draft GBON National Gap Analysis and the GBON National Contribution Plan reports to WMO Technical Authority and, as applicable, the draft Country Hydromet Diagnostics to the Monitoring Evaluation Risk and Performance unit of the WMO Secretariat. The draft reports have to follow the templates provided in the SOFF operational guidance documents.
- **Step 2.** WMO Technical Authority screens the draft GBON National Gap Analysis and the draft GBON National Contribution Plan to ensure consistency with the GBON regulations. The WMO Monitoring Evaluation Risk and Performance unit screens the draft Country Hydromet Diagnostics and provides feedback for revisions as needed.
- **Step 3.** The peer advisor submits the report with the Readiness phase outputs for beneficiary country and prospective Implementing Entity feedback.
- **Step 4.** The peer advisor finalizes the report for confirmation of receipt by the beneficiary country and, as needed, beneficiary country comments. Following beneficiary country receipt of the report, the peer advisor submits the report, including beneficiary country's comments and the prospective Implementing Entity's feedback, to the SOFF Secretariat.
- **Step 5.** The SOFF Secretariat confirms the satisfactory receipt of the report and informs the country and the prospective Implementing Entity accordingly. The SOFF Secretariat authorizes WMO to proceed with the release of the final payment, and informs the SOFF Steering Committee of the completion of the SOFF readiness phase.



#### 6. Signatures

By signing this document, the beneficiary country, peer advisor and the prospective Implementing Entity agree with the provisions stated in this Terms of Reference.

**Beneficiary country** KAMAL RAM JOSHI Nepal Peer advisor Jussi KAUROLA Prospective Implementing Entity (UNEP) 93 Jochem Zoetelief, 22.02.2023