UN Multi-Partner Trust Fund Office

General Information

Fund	MPTF_00281: The Systematic Observations Financing Facility
FMP Record	MPTF_00281_00036: SOFF Madagascar Investment Phase
MPTFO Project Id	
Start Date	
End Date	

Applicants

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h> D escription

Madagascar is a vast, diverse island and exposed to multiple climate hazards, including tropical cyclones, droughts, and floods. Because of its size and geographical location, Madagascar experiences different types of climate hazards and levels of exposures.

The country suffers from a limitation in observational network (based on the WMO Global GBON gap analysis conducted in June 2023). Strengthening of Madagascar's network will not only ensure availability of reliable data and improve the quality of numerical weather prediction products both at national level and contribute better to global model outputs but also, accelerate the sustained collection and international exchange of the most essential surface-based weather and climate observations in compliance with the internationally agreed Global Observing Basic Network (GBON).

Madagascar has **24 synoptic surface observations stations**. The General Directorate of Meteorology Madagascar **(DGM) operates 20 synoptic surface observation stations**. The **Agency for Air Navigation Safety in Africa and Madagascar (ASCENA**) operates **4 synoptic surface observation stations and 2 upper air (UA**) stations. The ASCENA stations (**both synoptic surface observation and UA) are already GBON compliant and do not need any further support from SOFF.**

Madagascar requires **15 surface stations and 3 upper-air stations** (UA) to close the most significant data gaps. The National GAP analysis conducted for Madagascar in June 2023, indicates that Madagascar needs to **upgrade 9 surface** stations and establish **2 new stations** to reach the target of **15 GBON-compliant stations**. In addition, **one more upper-air station** needs to be established (see 1). All these 9 surface stations and the 1 upper-air station need support from SOFF. The already GBON compliant 4 surface stations and 2 upper air stations belonging to ASECNA will not require any SOFF support.

The project proposes to replace **existing surface stations** that need to be upgraded with new Automatic Weather Stations (AWS): only some of the existing infrastructure can still be used, as repairing them would no longer be economical. The project also proposes to install **new stations to comply with standards recommended by the National Contribution Plan,** and improve some others in that way, including upper-air station

Three (3) surface stations are already AWS but need minor repairs, replacements and rehabilitation work (one solar panel replacement, two wind towers, two foundations, three LPS, two fences). A capacity building and enhancement plan is to be implemented and supported by a new business model that will be experimented in the meantime. This will allow necessary adjustments of the model during the project life cycle.

Universal Markers	**Gender Equality Marker**	**Risk**		
	• GEM1 - The Key Activity contributes to GEWE in a limited way	• Medium Risk		
Optional Markers	**WB Income Category**	• Low Income		
	UN LDC	• Yes		
	Small Island Developing States (SIDS)	• No		
Fund Specific Markers	**SOFF Phases**	**SOFF Phases** • Investment Phase		
	EW4All	**Early Warnings for All initial focus countries** • Yes		
	Fragile and conflict-affected situation	**Fragile and conflict-affected situation** • No		
	Peer advisor	**Peer advisor** • Deutscher Wetterdienst (DWD) [Germany]		
Geographical Scope	**Geographical Scope**	**Name of the Region**	**Region(s)**	**Country**
	• Country		• Africa	• Madagascar
Participating Organizations and their Implementing Partners	**UN Participating Organizations**	**Government/ Multilateral/ NGO/ Other**	**New Entities**	**Implementing Partners**
	• UNDP - UNDP (United Nations Development Programme (UNDP)) • WMO - WMO (World Meteorological Organization)			
Programme and Project Cost	**Participating Organization**	**Amount (in USD)**	**Comments**	
	Budget Requested			
	Total Budget Requested			
	Tranches			
	Other Sources (Parallel Funding)			
	Total			
Thematic Keywords				
Programme Duration	**Anticipated Start Date**	01-Mar-2025		
	Duration (In months)	36		
	Anticipated End Date	01-Mar-2028		

Narratives

Title	Text

Close the most significant data gaps

Madagascar has **24 synoptic surface observations stations**. The General Directorate of Meteorology Madagascar **(DGM) operates 20 synoptic surface observation stations**. The **Agency for Air Navigation Safety in Africa and Madagascar (ASCENA**) operates **4 synoptic surface observation stations and 2 upper air (UA**) stations. The 4 synoptic surface stations under ASCENA **are already GBON compliant and do not need any further support from SOFF. One UA station will be under the responsibility of DGM and will be newly implemented within the SOFF project. The two remaining UA station will remain under the responsibility of ASECNA.**

Table 1: GBON National Contribution Target

Type of station	**Baseline (Results of the GBON Global Gap Analysis)**				**GBON National Contribution Target**	
	Target (# of stations)	**GBON-compliant stations (#)**	**Gap**		**To improve**	**New**
			New	**To improve**		
Surface	15	4	0	11	9	2
Upper-air	3	0	1	2	0	1

Madagascar requires **15 surface stations and 3 upper-air stations**[1] (UA) (see Table 1) to close the most significant data gaps. The Global GAP analysis conducted for Madagascar in June 2023, indicates that Madagascar needs to **upgrade 9 surface** and establish **2 new stations** stations to reach the target of **GBON-compliance**. All these 9 surface stations and the 1 upper-air station need support from SOFF.

The project proposes to replace **Six (6)** out of **nine (9) surface stations** that need to be upgraded with new Automatic Weather Stations (AWS): only some, can still be used, as repairing them would no longer be economical.

The project proposes to install **two (2) new stations:** one close to the capital region at **Arivonimamo** and one at **Ambatondrazaka airport.** While there may exist additional stations that could benefit from improvement, the construction of these 2 new stations (one close to the capital region at Arivonimamo and one at Ambatondrazaka population density and relatively good infrastructure) is considered more sustainable and appropriate due to accessibility and infrastructure. The new station maintenance possibilities and early warning for a large proportion of the population, which is mainly concentrated around the capital and along the east coast.

Three (3) surface stations are already AWS but need minor repairs, replacements and rehabilitation work.

The proposed site for the **third upper•air station (one new upper air station) is Antsiranana (Diego Suarez).** This is a former site of an upper•air station coverage of the north in addition to a station in the southand centre. The DGM will operate the third upper air station, while ASECNA will operate the other Ensuring the required maintenance for durability and functionality is one of the most significant challenges. The DGM lacks financial resources (mostly fuel, costs) for supervision and maintenance of equipment, and the government which is responsible for the recruitment and deployment of staff within the DGM additional personnel since 1990. A lack of personnel with the appropriate profile is also preventing the DGM from obtaining ISO certification. The DGM will recrut employees to fulfil its official mandate including 16 staff to maintain the GBON Network as well as four additional Regional Maintenance Centres. A capacit) plan is to be implemented and supported by a new business model that will be experimented in the meantime. This will allow necessary adjustments of the cycle.

[1] When the term upper-air station is used, we only refer to radiosonde observations.

Target easy fixes	The target quick wins are to ensure sustained operation of the already existing infrastructure that builds maximum capacity for the country. This entails: • Upgrading existing 9 surface stations (AWS) and installing 2 new AWS and one new upper air station. **Six (6)** out of **nine (9) surface stations** to be upgraded, and in need of replacement with new Automatic Weather Stations (AWS): only some of the existing infrastructure can still be used, as repairing them would no longer be economical. • To guarantee sustainability of the network and individual stations, upgrade of existing infrastructure and the deployment of new stations factor in all expenses linked to procurement, operations, encompassing data transfer, communication, maintenance, calibration, field checks and replacement costs. This includes indirect expenditures associated with its operations, such as vehicles, transportation for maintenance, ICT, licensing, spare parts, equipment, telecommunication costs, training, as well as the managerial and administrative workload. • Optimize resource utilization through geographical proximity and local expertise, the project proposes to establish **four (4) Regional Maintenance Centers (RMC)** to be based in the following areas: Toliara, Farafangana, Mahajanga and Antalaha. While three out of four RMC need to be refurbished, the RMC in Farafangana will need to be newly built. However, all four need to be newly equipped with spare parts, field verification kits and tools. This is in addition to the headquarters in Antananarivo serving as the central RMC and calibration laboratory. Each RMC will be serving as maintenance hub for its region and allow for faster responsiveness and better accessibility of the stations distributed over the whole island. The four RMCs will also hold field verification kits and a number of all essential spare parts for the AWS installed in its administration area, allowing for more maintenance activities, covering temperature, humidity and pressure. The combination of field verification kits and spare sensor to be exchanged in case of failure, this allows to extend annual calibration periods to 2-3 years. An according Standard Operating Procedure will be developed. Every RMC will be equipped with a 4-wheel drive vehicle and motorcycles, a waterproof laptop, and necessary office equipment. The calibration laboratory in the headquarters in Antananarivo, will additionally be equipped with an air condition to ensure a safe working environment and ensure perfect storage conditions for the calibration equipment, The RMCs will need to be secured with autonomous renewable energy (solar PV) powering system, to ensure business continuity. The staff requirement for each RMC is as follows: one Regional Manager with an engineering degree and **3 to 4 technical experts**, holding a degree in electronics. The staffing plan of both RMC and headquarters needs to be aligned with the new business model of the DGM, to guarantee its financial sustainability. These RMCs are important for long-term GBON compliance due to the size, the topography and the infrastructure of the country. HeadquartersCalibration of instrumentation at all stations would barely be possible at the required intervals and many more replacement sensors would be needed as travel time from the headquarters is immense and its difficult accessibility from the capital. Considering where the headquarter is located, those periodic activities can be limited substantially, especially during rainy and tropical cyclone season, when good measurements are especially crucial. Having RMCs located in the planned towns would substantially improve the DGM's capacities to react to outages and fulfil maintenance and calibration schedules as required for GBON. Without the RMCs, long-term operations of especially very remote stations could be in jeopardy. The objective is to reach sustainable operationalization of all GBON stations under SOFF. The project will promote the importance of RMCs as maintenance and training centres to other NMHSs within the Southern African Development Community (SADC). Since Madagascar is a member of SADC, which comprises 16 member states in the Southern region of Africa and working together on climate information services aspects through the SADC Climate Services Centre (SADC CSC)[1]- Which the UNDP helped to establish and equip through the Satellite and Weather Information for Disaster Resilience (SAWIDRA) Program, the project will promote these RMCs as training facilities and maintenance of equipment and effective observational network coverage. • To ensure **security and safety of stations**, theft proof equipment will be installed (for example, climbing defence system on wind towers), as solar panels and other valuable equipment often gets stolen, if they are not securely mounted. In addition, all AWS will be equipped with a Lightening Protection System (LPS). Surge protection for all electrical equipment in the AWS will also be part of the overall lightning protection concept. • To support the DGM to carry out quality assurance through **maintenance and calibration of existing and new equipment** , including conducting field checks of atmospheric pressure, humidity and temperature, to guarantee continuous data collection and transmission, the project proposes to train the DGM staff in maintenance and calibration as well as post-processing activities to make use of the calibration equipment procured through the project "*Project to improve the adaptation and resilience capacities of rural communities in the face of climate change*" (PACARC) [2] initiative. The equipment has not been used yet due to a lack of knowledge on how to use these instruments. The headquarters will be equipped with wo sets of calibration equipment in order to conduct calibration activities for the whole nation. The PACARC project was co-funded by GEF and UNDP and implemented by UNDP Madagascar. The project was designed and implemented as multi-sectoral, working mainly with Ministry of Agriculture and the ministry of environment. The DGM was funded under the component 1 of the project: "Use of agroclimatological information for the adaptation of agriculture sector" The project procured one four-wheel vehicle (Toyota) for maintenance and 2 AWS, 5 agroclimatological stations, 4 hydrological stations to be installed. • DGM is currently collaborating with TAHMO to enhance the internal data flow of DGM, improve their technical capabilities to manage the transmission, storage, and backup of their meteorological data more efficiently, and integrate AWS to the system. The process of digitization of the data has started and is currently in progress with the integration of the data into Climsoft by the Hydrometeorological Database and Archives Department SBDAH, a unit under the DGM (Service de la Base des Données et des Archives Hydrométéorologiques). However, there is not yet an adequate backup process in place. To date, only manual backups are performed on a second computer at a different physical location. The project proposes to support the installation of an automatic back-up system between two servers allowing for frequent mirroring of the data as well

as geo redundant storage, requiring: Extra server (rack/tower); UPS; 5 hard drives (5 TB each, for RAID systems on both servers) and a medium sized generator to overcome longer power outages at the computing center, which cannot be buffered by the UPS alone. All hardware will be suitable for 24/7 operations, possibly at high ambient temperatures (in case of AC failure) and frequent read/write access. Country regulations do not allow for cloud-based solutions, as there is no service provider available in Madagascar and data are not allowed to be stored outside of the country borders.

DGM serving as head quarter will be powered with two solar PV generators for their two main buildings. This is to ensure service continuity and support them to face electricity outages in the country. In addition to this, two portable solar generators will be provided for onsite maintenance or monitoring/assessment interventions.

[1] SADC CSC provides operational, regional services for monitoring and predicting extremes in climate condition.it also provides training in climate prediction for personnel in the National Meteorological/Hydrological Services (NMHSs), also, covering the end users in all aspects of climate

[2] Projet d'Amélioration des Capacités d'Adaptation et de Résilience des Communes Rurales face aux Changements Climatiques

Create leverage	DGM works closely with the government departments and non-government institutions within Madagascar. It provides service products to sectors such as agriculture, health, energy, tourism, transport, water and many other private sectors led activities where weather forecasting and climate projections are critically vital for decision-making on investments planning and management. It provides meteorological, climatological, hydrological, and environmental services to the Malagasy society and is represented in each of the 23[1] regions of Madagascar by a Regional Meteorological Service supervised by the Regional Directorate of Transport and Meteorology. This SOFF investment will forge close working relationships with the respective ministries or Bureaus (e.g. Bureau National de Coordination des Changement Climatiques, du Carbone et de la Réduction des Emissions dues à la Déforestation et Dégradation des Forêts, or BNCCREDD+ belonging to the Ministry of Environment and Sustainable Development, the Ministry of Agriculture, Livestock and Fisheries, the Ministry of Energy and Hydrocarbures, the Ministry of water, sanitation and hygiene, the ministry of Home Affairs and the Office of the Prime Minister (both in charge of emergencies) that could be beneficial to create synergies and build the capacity needed to implement GBON. DGM uses observational data and forecast profiles, numerical weather prediction (NWP) models and satellite imagery, from several meteorological centres for its forecasting activities. The most important sources are the Global Forecast System (GFS), the Hurricane Weather Research and Forecast (HWRF) and the WAVEWATCH III (WW3) of the National Oceanic and Atmospheric Administration of the USA (NOAA), the Integrated Forecast System (IFS) and the Wave Model (WAM) from the European Centre for Medium-Range Weather Forecasts (ECMWF), the Global Deterministic and Met Office Global and Regional Ensemble Prediction System (MOGREPS) from the United Kingdom Met Office (UKMO), LAM AROME-IO[2] from the Tropical Cyclone Centre of La Réunion (RSMC-TC La Réunion) and the Unified Model UM4 from the Regional Specialised Meteorological Centre of South Africa (RSMC Pretoria-SAWS), which are part of the WMO Severe Weather Forecasting Programme (SWFP). The DGM uses a combination of regional and global NWP models, such as the NWP from the WMO Regional and Global Centres For short range forecasts, DGM is using the Ensemble Prediction System (EPS) of the ECMWF, the Global Ensemble Forecast System (GEFS) as well as UK's MOGREPS. Satellite imagery is received directly from EUMETCast[3] and accessed through the EUMETView Web portal. The DGM does not currently operate a weather radar station in Madagascar but is in dialogue with UNDP, the World Bank and the Hydromet IOC project to assess future options in this regard. This SOFF investment will also leverage and complement other initiatives undertaken by other bodies under the supervision of the Ministry of Transport and Meteorology, such as ASECNA and the *National School of Aeronautics and Meteorology* "Ecole Nationale d'Enseignement de l'Aéronautique et de la Météorologie" (ENEAM[4]), with which the DGM already has a close partnership. ASECNA - Agency for the Safety of Air Navigation in Africa and Madagascar – is an international public body governed by the Dakar Convention revised in 2010, with legal status and financial autonomy. In Madagascar, ASECNA operates four surface stations and two UA stations. All of them are already GBON compliant. ASECNA is currently responsible for the transmission of weather data (their own and data from DGM) to the Global Telecommunication System (GTS). The number of stations operated by ASECNA are included in the national GBON target, which makes ASECNA a crucial partner in the establishment of GBON. Those stations are operated and maintained by ASECNA on their own funds and do not require any SOFF support. DGM will forge and work closely with ongoing initiatives that are of great importance to GBON including the **Trans-African Hydro Meteorological Observatory (TAHMO) and the *Deutsche Gesellschaft für Internationale Zusammenarbeit*[5] - GIZ Madagascar**. **TAHMO** is working towards the goal to establish a 30 km dens network of hydro-meteorological monitoring stations in sub-Sahara-Africa, using an integrated and sustainable approach. TAHMO collaborates with the **GIZ program PrAda (Project for enhancing adaptation and resilience capacities of rural communities facing climate change)** to create a broader agro-climatological station observation network. This will provide stakeholders in agricultural value chains with a dependable database for informed decision-making. Although these stations do not conform to GBON standards, they will still contribute to the establishment of an observation network that will eventually go beyond the GBON criteria and provide useful additional information. Options for capacity building/trainings on quality management, particularly on aspects of station maintenance including field checks for sensor testing facilitated through GIZ and TAHMO should be explored. TAHMO will provide support to DGM in setting up a connection to the WMO World Information System (WIS) 2.0. . These measures will be implemented in accordance with ASECNA, who is currently responsible for data transmission to the GTS. As WIS 2.0 s is a vital aspect in the accomplishment of the GBON requirements, the further collaboration with THAMO is therefore of major importance to the SOFF project. This SOFF investment will also pursue and work closely with other international organizations or programs involved in related fields, such as climate change and disaster risk, within the country or region . PACARC (GEF/PNUD), Drought EWS (ECHO-UNDP-FAO-UNICEF-WFP), CREWS (WB/GFDRR/WMO/UNDRR), PRRC (WB) and SADC SAWIDRA/SARCIS-DR (EU/AfDB) are potential programs of particular interest. The project will also work with other projects (EU/UN-PACTE VERT), and financing mechanisms like the GFCS (WMO), the GCF, CREWS project through the HYDROMET IOC, for DGM transition from public institution to an Agency and QMS for climate services. Hence these specific projects have emerged from regional collaborations and are of interest to GBON as outlined below: The **IOC Hydromet Project**,will improve the National Meteorological and Hydrological Services (NMHSs) in Madagascar, Seychelles, Mauritius and the Comoros through a regional approach, by creating a Regional Climate Centre Network (RCC-Network). The project further will develop an optimized surface

observation network and associated Information and Communication Technology systems for the Southwest Indian Ocean Region, aligning with the GBON concept. The CREWS Southwest Indian Ocean project aims to strengthen the interface between DGM and Bureau National de Gestion de Risques et des Catastrophes (BNGRC) for disaster risk management and CPGU with respect to early warning systems. Madagascar is also a beneficiary country of the World Bank Regional Resilience Project for Eastern and Southern Africa. However, the project is still under planning and in case the project will be implemented as initially planned, the synergies with the 6 AWS would serve as an extension of the GBON Network to increase the coverage and encourage efforts towards GBON high density network.

Areas of intervention	Porjects & Partners
Observations	WMO (CREWS); COI (Hydromet); AUC (ClimSA); DGM (Etat); WB (PRRC); AfDB (ADRIFI); PNUD-DWD (SOFF); PNUD (CIDCA); PNUD-FAO-UNICEF-PAM (DEWS)
Data management and analysis	WMO (CREWS); COI (Hydromet); AUC (ClimSA); GIZ (PRADA); DGM (Etat); PNUD-FAO-UNICEF-PAM (DEWS); PNUD (CIDCA)
Forecasting	IOC (Hydromet; WB (PRRC); WMO (CREWS); AUC (ClimSa), DGM (Etat); USAID
Service provision	WMO (CREWS); IOC (Hydromet)
Institutional strengthening	WMO (CREWS); IOC (Hydromet); PNUD (CIDCA)
Infrastructure (constructions)	BM (PRODUIR); PNUD-DWD (SOFF); PNUD (CIDCA)

The following SOFF activities, are included in the project proposals of CREWS and the GCF project IOC Hydromet and are therefore not included in the SOFF funding proposal. Considering the importance of these activities to be carried out we will include them in the monitoring and reporting template (output 1.1 and output 1.3) for the sake of clarity and completeness:

- Feedback workshops on product and service quality (user feedback) (IOC Hydromet)
- Workshop on Gender mainstreaming in the provision of climate services CREWS
- Establishing a cost recovery mechanism for NMHS (legal authority for DGM to be paid for services/data etc.) CREWS
- Building up human capacity in the field of Weather monitoring and forecasting as well as impact-based forecasting (IOC Hydromet & CREWS)

Madagascar, is part of the EW4All initiative, where SOFF is seen as a foundational element and delivery vehicle for the second pillar of the initiative: "Hazard detection, observation, monitoring, analysis and forecasting". This will the improvement of national monitoring systems to close the GBON gap in Africa, and strengthen national capacities for effective disaster preparedness, anticipatory actions and early warning systems.

[1] According to DGM, the number of regions will increase to 26 in the coming years.

[2] limited-area coupled model called **AROME**-Indian Ocean (**AROME-IO**)

[3] EUMETCast is a method of disseminating various (mainly satellite based) meteorological data operated by the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)

[4] Accredited by the WMO, the meteorology courses of ENEAM and École Supérieure Polytechnique d'Antananarivo (ESPA) are further part of the WMO Regional Training Centres (RTCs) based in Madagascar

[5] German Development Cooperation

Maximize delivery capacity	DGM is represented in each of the 23 regions of Madagascar by a Regional Meteorological Service supervised by the Regional Directorate of Transport and Meteorology. Established in 1962 then as the National Meteorological Service of Madagascar, DGM has a longstanding experience in data collection, management of weather stations and meteorological network operation across Madagascar. UNDP Madagascar has a long experience in support to climate change and disaster risk management through capacity building of major actors such as DGM, BNGRC and CPGU. UNDP is though implementing following project: “Operationalization of the Early Warning System (EWS) and Anticipatory Actions (AA) in the Great South for anticipation and effective response to drought risk and increased resilience of Madagascar's populations and institutions” (financed by the European Union/DG ECHO). The project, led by UNDP Madagascar in cooperation with the 3 UN agencies FAO, WPF and UNICEF, aims to improve the coordination of strategic and operational interventions of anticipation, preparation and response to disasters caused by drought in the South of Madagascar, for which UNDP, FAO, WFP and UNICEF have strong expertise. The approach is to operationalize a Drought EWS for triggering adaptive and integrated Anticipatory Actions, drawing on the achievements and lessons learned from past EWS initiatives in Madagascar, based on the adoption and use of the SADC Subnational INFORM RISK Model, to allow scaling up at a national level and integration of other climate related hazards in one single integrated EWS. The project is also strengthening the operational capacities of the national authorities via the General Directorate of Meteorology (DGM), the National GRC Office (BNGRC) and sectoral and strategic leads from the Prevention and Emergency Management Support Unit (CPGU) at the Prime Minister’s Office, for the collection, centralization, and processing of data. The objective is that institutions and the population can better prepare, anticipate, and manage the risk of drought. The project runs until March 2025, which will allow for good coordination with the MHEWS-M project. UNDP has also implemented in the last years, the “Cooperation Normandie/Atsinanana Region”, project focusing on strengthening the regional capacity for DRM. The Atsinanana region on Madagascar's Eastern coast, where the main port of Toamasina is situated, is frequently hit by floods and cyclones. The project includes the strengthening of DRM committees at all levels (commune; district and region), to improve the transmission of alerts and hazard mitigation actions in the region, in partnership with the BNGRC, Regional DRC Committee, and the Civil Protection Unit of the Ministry of Defence. The current funding request will build on this project and continue to strengthen capacities at all levels in the region. In the previous years also, UNDP has implemented the PACARC project (Improving the Capacities for Adaptation and Resilience to Climate Change in Rural Communities in Madagascar): This project, co-funded by the Global Environment Facility and UNDP Madagascar, included both the installation of 5 automatic weather stations in partnership with the Meteorological authorities of Madagascar, as well as community adaptation activities in the Atsinanana region, where the proposed project will also work, with the strengthening of weather forecasting (both hydro and agro-meteorological) products delivered to farmers and communities. The PACARC project also worked on engaging fishermen on the eastern coast in EWS related to cyclones. The current project will thereby be able to capitalize on previous EWS-related initiatives with the communities and target region, as well as the national institutions at central, regional and local level. We can also consider the AIED project (Institutional support to effective decentralization), which is part of the governance portfolio of UNDP Madagascar, and focused on support to the crucial national decentralization process, including the implementation of territorially/locally adapted governance initiatives, and the enhancement of Disaster Risk Reduction capacities of relevant government institutions. The project has supported the adoption of priority legal and regulatory frameworks for an effective decentralization process and capacity building of regional and local institutions to implement policies. The project has also supported the establishment of the Operations Centre of the BNGRC. In the meantime, UNDP is implementing the Madagascar Governance Strengthening Program – RINDRA, Co-financed by USAID and UNDP. The RINDRA program focuses on strengthening the rule of law; the governance of financial management, accountability, and citizen participation at regional and communal levels, to enhance the capacities of local governments to implement more efficient and inclusive national policies, through integrated and inclusive development plans and aligned budgeting for effective public management at regional and local level. The RINDRA project includes activities and a project office in different regions, where the proposed funding request will also intervene at the level of region and local communities. The two projects will thereby be able to coordinate governance strengthening for DRR and MHEWS at the regional and local level. UNDP has also supported the government through the DGM with the elaboration of Madagascar’s new Policy on Meteorology, through the GCF NAP readiness project, meant for country preparation to the implementation of the National Adaptation Plan (NAP). Under this project, several information products on Adaptation to Climate Change for the private sector have been developed, as well as conceptual notes for the implementation of the NAP. All these constitute support tools for an effective consideration of DGM products and services for climate change adaptation and mitigation in the country. Further to that, UNDP has supported the country in the preparation for submission to CIDCA (China International Development Cooperation Agency), the “Tailored Intelligence for Actionable Early Warning Systems-Madagascar” project: The TIAEWS-Mad project offers a powerful solution: a comprehensive approach to early warning systems tailored specifically to our Madagascar needs but also linked at the global and regional levels to other TIAEWS projects through the overarching TIAEWS Programme. The project aims at increasing preparedness and response capacity to disasters within seven regions of Madagascar through the development of tailored and accessible early warning systems (EWS), with three main outputs: i) Streamlined data and information management system for EWS, enabling timely and effective decision-making by government and key stakeholders, including an Operational Centre for Hydro-meteorological forecasting and a sub national Emergency Operations Centre; ii) Enhanced

	communication and community engagement strategy for Early Warning Systems, ensuring widespread access to tailored decision intelligence, Including strengthening communications infrastructure and systems; iii) Enhanced governance frameworks for Early Warning Systems, ensuring robust and reliable data collection, analysis, and dissemination. In addition, the close cooperation with SADC's Climate Services Center, facilitates any action towards improving delivery capacity for GBON compliance. SADC CSC provides operational, regional services for monitoring and predicting extremes in climate condition. it also provides training in climate prediction for personnel in the National Meteorological/Hydrological Services (NMHSs), also, covering the end users in all aspects of climate. The SADC CSC will be instrumental in providing training and capacity building to maintain robust data exchange within the region and across the globe. Thanks to its decades of experience and expertise, the German Weather Service (DWD) can offer technical and planning support. In addition, there has been very good cooperation between the DWD and the DGM for many years, which can be built upon here.
Sub-regional gains	Madagascar is a member of various regional alliances such as the Indian Ocean Commission (IOC), the Southern Africa Development Committee (SADC), the Tropical Cyclone Committee (RA I TCC), the Severe Weather Forecasting Programme South Africa (SWFP SA). Specific projects that have emerged from these regional collaborations and are of interest to GBON are outlined below: "*Building Regional Resilience through Strengthened Meteorological, Hydrological and Climate Services in the Indian Ocean Commission Member Countries*" ***(IOC Hydromet Project)***, will improve the National Meteorological and Hydrological Services (NMHSs) in Madagascar, Seychelles, Mauritius and the Comoros through a regional approach, by creating a Regional Climate Centre Network (RCC-Network). the project further will develop an optimized surface observation network and associated Information and Communication Technology (ICT) systems for the Southwest Indian Ocean Region, aligning with the GBON concept. The SOFF project will initiate dialog to leverage synergies regarding information sharing, resource mobilization and project implementation is crucial. The implementation of a Regional Maintenance Center approach could serve as a platform for the DGM to promote the exchange of knowledge and experiences among NHMS facing similar issues. This presents a valuable opportunity to apply capacity-building programs and explore the beneficial utilization of shared resources. The CREWS Southwest Indian Ocean project aims to strengthen the interface between DGM and Bureau National de Gestion de Risques et des Catastrophes (BNGRC) for disaster risk management and CPGU with respect to early warning systems.[1] Additionally, Madagascar is a beneficiary country of the World Bank Regional Resilience Project for Eastern and Southern Africa. Through this project DGM is expecting 6 new AWS, 6 new automatic Hydrology stations and 1 weather radar. However, the project is still under planning and there is no clear installation plan or time schedule yet. In case the project will be implemented as initially planned, the 6 AWS would serve as an extension of the GBON Network to increase the coverage and encourage Madagascar's effort to aim for GBON high density. In order to make use of possible synergies and to avoid overlapping project targets, constant exchanges between the projects is envisaged. SOFF activities further complement the IOC Hydromet Projects activities within Madagascar, which also allow for sub-regional leverages between the Indian Ocean Commission countries. The IOC Hydromet project intends to develop an optimized surface observation network and associated Information and Communication Technology (ICT) systems for the Southwest Indian Ocean Region, aligning with the GBON concept. To avoid duplication of effort, early and ongoing communication between the two projects has been established. Madagascar is currently covered by the regional WIGOS Center (RWC) southern Africa countries. The DGM will benefit from the maintenance of the observational metadata and data performance. Madagascar is currently a member state of the Southern African Development Community (SADC) and SADC's Climate Services Centre (SADC CSC) based in Botswana. The linkage between the project and SADC CSC will benefit Madagascar in observational data access and management. The SADC currently hosts the INFORM RISK MODEL, where UNDP is engaged to support its setting and implementation at sub-national level for Madagascar. UNDP through its SDG Artificial Intelligence Unit based in Istanbul and its Resilience Hub based in Nairobi will also facilitate access to satellite data that will help enhancing modelling capacities of DGM. Further to that, UNDP in support to Madagascar efforts under the SADC initiatives will facilitate collaboration with AfDB funded Regional Advanced Retransmission Service (RARS) in South Africa, installed in Africa and Numeric weather prediction infrastructure (high performances computers with modelling capabilities) linked to all SADC regional members. The RARs will also enhance access to satellite data from low polar orbiting meteorological satellites. [1] South-West_Indian_Ocean_-_CREWS_Proposal_3-final.pdf (South-West_Indian_Ocean_-_CREWS_Proposal_3-final.pdf (ane4bf-datap1.s3-eu-west-1.amazonaws.com)

SOFF Beneficiary Country Capacity Assessment	The DGM (National Meteorological and Hydrological Service of Madagascar) Was established on February 28th 1962 by a decree No 62- 099 bis and is under the Ministry of Transport and Meteorology of the government of Madagascar. It consists of two main departments namely: the Directorate of Meteorological Operations[1] (DEM) and the Directorate of Hydrometeorological Research and Development[2] (DRDH). DGM is mandated to protect life and property against natural disasters of meteorological and climatic origin. It is responsible for the development and sustainable maintenance of a national hydro-meteorological network, weather analysis and forecasting, and climate services that serves the public interest. Other Institutions under the supervision of the Ministry of Transport and Meteorology And working in collaboration with DGM include, ASECNA and the *National School of Aeronautics and Meteorology* "Ecole Nationale d'Enseignement de l'Aéronautique et de la Météorologie" (ENEAM[3]). ASECNA - Agency for the Safety of Air Navigation in Africa and Madagascar operates four surface stations and two UA stations. All of them are already GBON compliant. ASECNA is currently responsible for the transmission of weather data (their own and data from DGM) to the Global Telecommunication System (GTS). The number of stations operated by ASECNA are included in the national GBON target, making ASECNA a strong partner in the establishment of GBON. In the future it is foreseen that all GBON stations (including the ASECNA stations) will be integrated into WIS 2.0. The future responsibility for data exchange to WIS 2.0 is currently being discussed between DGM and ASECNA. DGM works closely with the BNGRC on disaster risk management and early warning systems. The DGM is officially recognized as the National Warning Authority for Hydrometeorological Hazards in Madagascar, but the Integrated Multi-Hazard Early Warning System (MHEWS) is operated by the BNGRC and the Centre for Studies, Reflection, Monitoring and Guidance[4] (CERVO), its focal point for all warnings and disaster information. DGM works closely other government ministries or Bureaus that could support or benefit from GGBON activities (e.g., Bureau National de Coordination des Changement Climatiques, du Carbone et de la Réduction des Emissions dues à la Déforestation et Dégradation des Forêts ou BNCCREDD+ belonging to the Ministry of Environment and Sustainable Development and the Ministry of Agriculture, Livestock and Fisheries). These officers and ministries could be beneficial to create synergies and build the capacity needed to implement GBON. The Madagascar observation network needs expansion and to be fully operational. DGM provides climate and weather services to Madagascar and is represented in each of the 23[5] regions in the country by a Regional Meteorological Service supervised by the Regional Directorate of Transport and Meteorology. Data are derived from the national observation network comprising 24 synoptic surface observation stations (54% (partly) operational), 36 agro-climatological stations (47% operational) and 2 upper-air stations (100% operational). The level of GIS data available in Madagascar remains low. However, the DGM works with GIS datasets, which it uses for climate modelling and weather forecasting. Thus, the combination of this data with satellite geospatial data is also a major challenge. Carrying out these missions will also require maximizing digitalization within the DGM and through the products and services implemented. In this perspective, digitalization represents a key opportunity for Madagascar that can be exploited in this project. A digital strategy will thus be implemented to integrate the value of digitalization with all stakeholders. In this sense, the telecommunications sector in Madagascar is reasonably developed, with a combined fixed and mobile-cellular telephony density of approximately 45 per 100 people. There are 12 operators providing services such as fixed telephony, GSM mobile telephony and standard Internet, data transmission and other communication services such as electronic payment processing. The most important operators are TELMA, Orange Madagascar, Airtel Madagascar, and Starlink. Competition between these major service providers is driving the recent growth of the mobile and telecommunications market. Digital payment through mobile money can be further developed in the digital strategy. The current business model for the DGM is public. The project recommends a fully public business model. Although the public business model carries some risks, strengthening the public sector is the most sustainable model at this point in time. The DGM has a solid organizational structure supporting the chosen business model. There is currently no private service provider that could take over. In addition, most of the actors in the country are from the public sector, with whom close cooperation is explicitly desired (e.g. GIZ, UN, etc.). In order to become more financially independent of the funds provided by the Ministry, the possibility of a cost recovery mechanism is currently being examined (NCP). The RMCs provide further potential in this regard, as calibration services for neighbouring countries and island states can be integrated. The assessment of the capacity of the DGM to deliver on the GBON National contribution plan recommends the support and strengthening of the DGM's climate and information systems including, Data gathering, storage, processing and sharing as described in the NCP. To maintain a GBON-compliant network, there is need to ensure sustained national budget allocations to strengthen DGM capacity. While the SOFF investment will cover the initial investment for operations and deployment, as well as long-term results-based funding triggered by verified data exchange results, to be monitored globally in real time by the World Meteorological Organisation, it is advisable to develop a national financing plan in parallel. This plan can guarantee and ensure the sustainable continuation of the observation network to be implemented, even with limited external financial support. Capacity building of staff is also emphasized. The NCP highlights the involvement of stakeholders and end users cater to their needs more effectively.

	Appropriate mitigation measures have been identified (and are summarized in the Risk Management section in this proposal). It is envisaged that in the course of implementing this project, the DGM will build its capacity and become better equipped to implement similar programs and projects in the future. The capacity building program detailed in this proposal will sustainably enhance the capacity of DGM over the course of this project with a lasting impact beyond the project period. Further to that, this project will rely on SOFF projects network and other DWD and UNDP meteorology related project via a customized suite of knowledge tools; technical and operational expertise; convening platforms (communities of practice); communications; and digital data and reporting mechanisms. it will offer or core sets of activities that could developed around: (i) knowledge tools for both public and private actors; (ii) tailored technical assistance to countries; (iii) communities of practice; (iv) digital tools and solutions for mini-grid cost reductions; and (v) monitoring and evaluation. Increased knowledge, awareness and network opportunities in the meteorology systematic observation networks and among stakeholders, including benefitting from linkages to international good practice, is key to the success of the Initiative [1] Direction des Exploitations Météorologiques [2] Direction des Recherches et Développements Hydrométéorologiques [3] Accredited by the WMO, the meteorology courses of ENEAM and École Supérieure Polytechnique d'Antananarivo (ESPA) are further part of the WMO Regional Training Centres (RTCs) based in Madagascar [4] Centre d'Etudes, de Réflexion, de Veille et de l'Orientation [5] According to DGM, the number of regions will increase to 26 in the coming years.
Investment Phase Alignment with the GBON National Contribution Plan	The present funding request will require investment in one central calibration laboratory at HQ, supported with field verification kits (9) available for the 4 RMC in Tulear, Mahajanga, Antala and Farafangana, as compared to what was indicated in the original NCP. This further explained in the “Target easy fix” section of the funding request.

Execution model and implementation arrangements	IMPLEMENTATION Project Organization and Institutional Analysis Implementing Entity: United Nation Development Programme (UNDP) is the SOFF Implementing Entity. UNDP will build on its experience in delivering country projects in Africa to oversee appropriate implementation of the SOFF support in line with UNDP procedures and standards, and specific requirements in the Legal Agreement that will be signed by UNDP and the UNMDTF acting on behalf of SOFF as well as the provisions in the SOFF Operational Manual. UNDP technical and operations teams shall conduct supervisory missions at least twice a year during the project implementation period. In addition, UNDP shall provide constant advice and guidance to the entities that will implement the Project in terms of technical aspects, fiduciary requirements including prohibited practices, environmental & social aspects, and monitoring & evaluation. UNDP and DGM with the support of the peer advisor will oversee and monitor the activities. UNDP will comply with both UNMPTF and SOFF reporting requirements and complete the Progress Reviews (IPR) to track the results specified in the projects results framework. A mid-term review and project completion report will be done mid-way and at the close of the main project. UNDP will align reporting with the umbrella agreement signed with the UNMPTF and the reporting for DWD will be aligned with the assignment agreement signed with the WMO through the SOFF passthrough mechanism. ***Executing Entity:*** The DGM will execute this project and manage other partnerships in the execution, with fiduciary responsibility to UNDP. The project shall form a Project Coordination Team (PCT) to support overall implementation of the project. Members of PCT shall include the Ministry of Transport, DGM, Civil aviation Ministry of Water, SADC, Madagascar ministries utilizing weather data, representative of international organization implementing similar activities in Madagascar. The presence of the PCT shall help to create awareness and support advocacy of the projects activities and raise the profile of DGM as an essential ingredient for Madagascar's planning and development agenda. The PCT will support project's overall policy, review development of work plans and coordination of project activities in line with the Funding Agreement between UNDP and the Madagascar the PCT will provide technical inputs in reviewing work plans and progress reports and support in addressing issues that affect the smooth implementation of activities. UNDP will retain the overall responsibility for effective coordination, execution and management of the project including budget and financial management, procurement, progress reporting and monitoring. ***Peer advisor:*** The Peer Advisor for this project is the Deutscher Wetterdienst (DWD). The DWD is the German National Hydro-meteorological Service, based in Offenbach am Main, Germany. It is mandated by the government of German to monitor and provide climate information services in Germany, including for the general public and for nautical, aviation, hydrometeorological or agricultural purposes. DWD will provide technical support and contribute to supervision for the implementation of the project as well as support UNDP and contribute in providing regular feedback to the SOFF secretariat on the evolution of the Investment Phase activities. In addition, the Peer Advisor will: • General technical advisory to support the beneficiary country and the implementing entity in the implementation of the National Contribution Plan and agreed activities for the Investment Phase (bidding documents development, bid assessment and/or evaluation, ensuring the correct commissioning and initial operation of equipment, supporting dispute resolution with suppliers on technical matters)Support exploration of synergies with ongoing complementary activities and facilitate stakeholder engagement in coordination with the Beneficiary Country and Implementing Entity. • Contribute and provide recommendations and guidance on reporting. • Provide technical support and review of the AWS and upper air station tender process (incl. technical specifications) • Provide support on Metadata Management mechanisms • Coordination with SOFF secretariat and WMO technical units • Project coordination with DGM, UNDP, TAHMO and GIZ through by-weekly (adjustable) project management meetings. Technical support on management, IT and communication tenders and purchasing processes.

Private sector involvement	For Madagascar and its specific country context, we propose to apply a fully public business model. This means that full ownership and control of the observing system, operations and services is with the government and therefore with the NMHS. Although there is a private partner involved in operations in Madagascar (ASECNA), data exchange between the two parties is free of charge and a good partnership exists. Therefore, we would still consider it a fully public business model. The private partner's four stations are already GBON compliant and therefore do not require further SOFF support. The remaining 11 stations to be made GBON compliant with the support of SOFF will be fully owned and operated by the NMHS. Although the public business model carries some risks, we believe that strengthening the public sector is the most sustainable model at this point in time. As described in the CHD, the DGM has a solid organizational structure supporting the chosen business model. There is currently no private service provider that could take over. In addition, most of the actors in the country are from the public sector, with whom close cooperation is explicitly desired (e.g. GIZ, UN, etc.). In order to become more financially independent of the funds provided by the Ministry, the possibility of a cost recovery mechanism is currently being examined. The DGM has a memorandum of understanding with mobile operators working within Madagascar. These operators include Orange Madagascar, Telma and Airtel Madagascar. They support the cost of sim card for AWS data transmission and other specific needs of DGM such as laptops, motor bike, civil work for AWS installation, wifi boxes etc. For each mobile firm company, the yearly in-kind counterpart amount is 7 200 000 Ariary. It is thus obvious that digital technologies and solutions are fundamental to enable the diffusion of DGM products and services, which highlights the need to demonstrate innovative approaches in the field that could be further replicated by other projects implemented by DGM. Hence Specific terms and conditions for data-sharing and how best to operationalize the commitment and its adoption by the beneficiaries will be defined and agreed upon with DGM during project implementation, including details of what data can and cannot be used, based on consultations with stakeholders and with support from the SOFF. The specifications around the data generation by the demonstration pilots supported by the project will consult and follow guidance/standards provided by the SOFF and WMO. A standardized Quality Assurance and Monitoring Framework (QAMF) for application will be developed and disseminated to all SOFF national projects, for knowledge sharing purpose. A data platform could be part of the strategy to be procured by the project as part of the national digital strategy to serve different purposes including: (1) managing all technical and financial data related to DGM products and services. For the case of Madagascar, the Edge computing element is the best use of the digital technology. Depending on the delivery model adopted by Madagascar and if more funding is acquired, a data platform for running digital models by which DGM will interact with beneficiaries to give them adequate support could be explored. Similarly, as part of the roll-out of the data platform, the DGM (as well as key government and other stakeholders) will receive capacity-building and in-depth training to use analytical tools and data management technologies.
Civil society participation	SOFF operations will include a strong focus on community engagement, through site selection, security arrangement and use of equipment. This will elevate understanding of climate risks and achieve sustainable change in behaviour among local communities. The population of Madagascar approximately 28,812,195 million people (2023) who mainly live in rural areas will greatly benefit from improved climate information services through the provision of timely early warning hydro hydrometallurgical information. Participation of other partners (e.g., NGOs, private sector, and academic institutions) will further promote the long-term sustainability of results. The project expects that CSO will be brought in through collaborative processes, specifically relevant during the stakeholder engagement workshops, where specific vulnerabilities and gender aspects will be addressed. The CSO will also play a critical role especially in the sustainability of this project. They'll play a critical role in preparing the government and communities to eventually manage and implement government projects by themselves.

Fiduciary systems	Under this arrangement, the UNDP as SOFF implementing Entity will provide fiduciary oversight of the project, including those pertaining to procurement and financial management, in accordance with UNDP's regulations and rules, policies and procedures, as per the project work plan approved by UNDP. UNDP has a country office in Madagascar, which is backed up by regional office based in Addis-Abeba, Ethiopia and New York, USA. These two offices are strongly supported by UNDP headquarter staff based in New York, USA. This arrangement will provide sufficient fiduciary backstop to the project. UNDP fiduciary teams shall conduct supervisory missions during the project implementation period. In addition, UNDP shall provide constant advice and guidance to the Project in terms of fiduciary requirements including prohibited practices, environmental & social aspects, and monitoring & evaluation. UN MPTF as SOFF trustee will transfer the project funds to UNDP upon the approval and signing of the Fund Request; and meeting necessary condition(s) and submitting the required documentations for disbursement. Using the necessary UNDP's project management rules and regulations, UNDP will then sign a grant agreement ("Grant Agreement") with the Government of Madagascar (The Ministry of Transport and Meteorology), representing the DGM. UNDP will create a special account for SOFF proceeds to undertake this funded activity as approved by the SOFF Secretariat. Disbursement of the proceeds for the project will be done according to the terms and conditions of the Financing agreement as well as provisions of the Disbursement Handbook in force at UNDP. UNDP will use the following disbursement methods (a) the special account method (for operating expenses, payment of project staff, and certain workshop related expenses) and (b) the direct payment method for the payment of works, goods and service contracts. Large procurements such as the acquisition of automatic weather stations will be made directly by UNDP to suppliers and service providers upon submission of relevant completion documents. Procurement will follow UNDP procurement procedures. **Procurement and financial management arrangements** All procurement of goods, works, and related services and acquisition of consulting services will be in accordance with UNDP's Rules and Procedures for Procurement of Goods, Works and Services using the relevant UNDP Standard Bidding Documents, and the provisions stipulated in the Financing Agreement. UNDP's operation teams consisting of procurement and financial management officers will carry out assessment of procurement risks at the Country, Sector, and Project and Executing Entity levels. This will inform the choice on the procurement regimes applicable for specific transactions or groups of similar transactions under the project. Appropriate mitigation measures will be identified. UNDP will support the DGM in procurement using the UNDP's procurement rules and regulations. UNDP will consider all regulations related to tax, customs or international shipping at the time of procurement or purchasing of the stations (spare parts and all related infrastructures). UNDP will properly account for the regulated taxes and potential custom fees. **Financial Management, Disbursement, and Audit** UNDP will carry out fiduciary due diligence on the Government of Madagascar and DGM. The Institutions will develop a fiduciary safeguards system arrangement with UNDP and DGM following the conditions and terms stated in the approved fund request between UNDP and based on its own rules, regulations and policies. *Interim and Annual Reporting* : UNDP will require the DGM to prepare on a six-monthly basis and, interim unaudited financial reports adequate to reflect expenditures relating to the project's funding.

Social and environmental safeguards	***Environmental and Social Safeguards*** ***UNDP's revised Social and Environmental Standards came into effect on 1 January 2021.*** UNDP's Social and Environmental Standards (SES) underpin our commitment to mainstream social and environmental sustainability in our Programmes and Projects to support sustainable development. The SES objectives are to: • Strengthen the quality of programming by ensuring a principled approach • Maximize social and environmental opportunities and benefits • Avoid adverse impacts to people and the environment • Minimize, mitigate, and manage adverse impacts where avoidance is not possible • Strengthen UNDP and partner capacities for managing social and environmental risks • Ensure full and effective stakeholder engagement, including through a mechanism to respond to complaints from project-affected people. The SES are an integral component of UNDP's quality assurance and risk management approach to programming. This includes the project-level The standards are underpinned by Accountability Mechanism with two key components: (i) A Stakeholder Response Mechanism (SRM) that ensures individuals, peoples, and communities affected by UNDP projects have access to appropriate grievance resolution procedures for hearing and jointly addressing project-related disputes; and (ii) A Compliance Review process to investigate and respond to claims that UNDP is not in compliance with the Social and Environmental Standards. Also considering the fact that climate change impacts affect men and women differently, given the different roles and responsibilities they have at the household and at the community levels. Women are particularly vulnerable to climate change; however, they play central role on climate issues i.e. having deep understanding of their direct environment, their experience in managing natural resources (water, forests, biodiversity and soil), and their active role in climate-sensitive activities such as farming, forestry and fisheries. Women can play a role in climate change adaptation and are often natural resource managers who can help develop strategies to cope with climate-related risks. Within this context, an initial gender assessment plan will be prepared. Following the assessment, and already recognising gender balance is currently inexistent, all the staffing activities and training activities will include the recommendation of enhanced women representation and favouring the inclusion of female staff in the DGM. The stakeholder workshops will include a specific topic on gender issue not only to allow discussions but to advocate for gender equality and empowerment with all the relevant actors in the place. From an execution perspective, gender balance will also be sought so that the related staff from UNDP and its execution party and the Peer Advisor include 50% of female staff members.
Dispute resolution mechanism	The Social and Environmental Compliance Unit (SECU) investigates alleged non-compliance with UNDP's Social and Environmental Standards and Screening Procedures from project-affected stakeholders and recommends measures to address findings of non-compliance. The Stakeholder Response Mechanism helps project-affected stakeholders, UNDP's partners (governments, NGOs, businesses) and others jointly address grievances or disputes related to the social and/or environmental impacts of UNDP-supported projects. Affected people have a choice: They can ask SECU to pursue a compliance review examining UNDP's compliance with UNDP social and environmental commitments, they can attempt to resolve complaints and disputes through the Stakeholder Response Mechanism or they can ask both for compliance review and for an effort to resolve their concerns.
Additional relevant policies and procedures	-

SDG Targets

Target	Description
Main Goals	
Goal 13. Take urgent action to combat climate change and its impacts2	
TARGET_13.1	13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
TARGET_13.2	13.2 Integrate climate change measures into national policies, strategies and planning
TARGET_13.3	13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
TARGET_13.b	13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities

Target	Description
Secondary Goals	
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable	
TARGET_11.b	11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels

SDG Indicators

Indicator Code	Description
C130b01	13.b.1 Number of least developed countries and small island developing States that are receiving specialized support, and amount of support, including finance, technology and capacity-building, for mechanisms for raising capacities for effective climate c

Contribution to SDGs

No data available.

List of documents

Document	Document Type	Document Source	Document Abstract	Document Date	Classification	Featured	Status	Modified By	Modified On
10SC-Summary-of-Decisions-SW-2.pdf	Other Docs	Project	SOFF Steering Committee decision on the approval of the funding request	06-Feb-2025	External	No	Finalized	ajuntalan@wmo.int	18-Feb-2025 7:11:21 AM
2025.01.13 Peer Advisor TOR (signed)).pdf	Other Docs	Project	Peer Advisor TOR	13-Jan-2025	Internal	No	Finalized	ajuntalan@wmo.int	24-Jan-2025 9:07:27 AM
Gateway annex - Monitoring & Reporting Madagascar VF.docx	Other Docs	Project	6. Investment Phase Monitoring and Reporting	30-Nov-2024	Internal	No	Finalized	karim.a.ahmed@undp.org	17-Dec-2024 5:43:52 AM
20241129_NCP_Madagascar.pdf	Other Docs	Project	GBON National Contribution Plan - Nov 2024	30-Nov-2024	Internal	No	Finalized	tlhamo@wmo.int	16-Dec-2024 5:40:21 AM
GBON National Gap Analysis_Madagascar_20240515_clean.pdf	Other Docs	Project	GBON National Gap analysis Madagascar	13-Dec-2024	Internal	No	Finalized	karim.a.ahmed@undp.org	14-Dec-2024 7:21:38 AM
2024-04-05-CHD_final-screened_soff.docx	Other Docs	Project	2024-04-05-CHD_final-screened_soff	05-Apr-2024	Internal	No	Finalized	karim.a.ahmed@undp.org	03-Dec-2024 4:21:18 PM

Project Results

Outcome	Output	Description
1. GBON institutional and human capacity developed		
	1.1 National Consultations conducted	1.1 National consultations including with CSOs, and other relevant stakeholders conducted.
	Activities	
	No activities available.	
	1.2 NMHS institutional capacity developed	NMHS institutional capacity required to operate the GBON network developed.
	Activities	
	No activities available.	
	1.3 NMHS human capacity developed	NMHS human capacity required to operate the GBON network developed.
	Activities	
	No activities available.	
2. GBON infrastructure in place		
	2.1 New land- based stations in place	New land-based stations and related equipment, ICT systems, data management systems and standard operating practices in place.
	Activities	
	No activities available.	
	2.2 Improved land-based stations in place.	Improved land-based stations and related equipment, ICT systems, data management systems and standard operating practices in place.
	Activities	
	No activities available.	
	2.3 New upper-air stations in place.	New upper-air stations and related equipment, ICT systems, data management systems and standard operating practices in place.
	Activities	
	No activities available.	
3. Sustained compliance with GBON		
	3.1 GBON land-based stations commissioning period completed.	GBON land-based stations' commissioning period completed, country-specific standard cost for operations and maintenance established, and data sharing verified by WMO Technical Authority
	Activities	
	No activities available.	
	3.2 GBON upper air stations' commissioning period completed.	GBON upper air stations' commissioning period completed, country-specific standard cost for operations and maintenance established, and data sharing verified by WMO Technical Authority.
	Activities	
	No activities available.	

Signature Indicators

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Linked Outcome / Output
No signature indicators available.												

Imported Fund Outcome / Output Indicators

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year
Number of new land-based stations installed		Number of stations as defined in the National Contribution Plan.	Progress updates/Annual or quarterly reports	Investment	At closure	Country	Number	0	2025	2	2026
Number of land-based stations improved		Number of stations as defined in the National Contribution Plan.	Progress updates/Annual or quarterly reports	Investment	At closure	Country	Number	0	2025	9	2026
Number of new upper-air stations installed		Number of stations as defined in the National Contribution Plan.	Progress updates/Annual or quarterly reports	Investment	At closure	Country	Number	0	2025	1	2027
GBON land-based stations' commissioned		Number of stations as defined in the National Contribution Plan.		Policy	At closure	Country	Number	0	2025	11	2028
GBON upper air stations' commissioned		Number of stations as defined in the National Contribution Plan.		Policy	At closure	Country	Number	0	2025	1	2028

Project Indicators

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Link Outc / Out
# kick-of worksho ps and stakehol der engagem ent		organise kick-of workshop and stakeholder s engagemen t meeting at national level and regional level	Inception report	Beneficiaries	At closure	Country	Number	0	2025	5	2025	**Outc : 1.** GBO instit nal a huma capa deve d **Outp** 1.1 Natic Cons ions conc d
	No components available.											
# linkage to WIS 2.0 is set up and back-up system is in place		Establish link to WIS 2.0 and install back-up system	Back-up reports	Capacity	At closure	Country	Number	0	2025	1	2025	**Outc : 1.** GBO instit nal a huma capa deve d **Outp** 1.2 NMH instit nal capa deve d
	No components available.											
# of trainings for DGM staff and associate d governm ent institutio ns		Implement training plan for DGM staff and associated government institutions	Training reports	Beneficiaries	At closure	Country	Text	0	2025	2	2026	**Outc : 1.** GBO instit nal a huma capa deve d **Outp** 1.3 NMH huma capa deve d
	No components available.											

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Link Outc / Out
# of trainings on surface-based station installation and maintenance		Implement training plan for staff in charge of surface based station installation	Training report	Beneficiaries	At closure	Country	Text	0	2025	5	2026	**Outc : 1.** GBO institi nal a huma capa deve d **Outp** 1.3 NMH huma capa deve d
	% of women participation to trainings			Beneficiaries	At closure	Country	Percentage	0	2025	30	2027	
# of trainings on surface-based station operationalization		Implement training plan for staff in charge of surface based station operationalization	Training reports	Beneficiaries	At closure	Country	Text	0	2025	1	2026	**Outc : 1.** GBO institi nal a huma capa deve d **Outp** 1.3 NMH huma capa deve d
	% of women participation to trainings		Training reports	Beneficiaries	At closure	Country	Percentage	0	2025	30	2027	
# of trainings on surface-based station field verification		Implement training plan for staff in charge of surface based station field verification	Training reports	Beneficiaries	At closure	Country	Text	0	2025	5	2027	**Outc : 1.** GBO institi nal a huma capa deve d **Outp** 1.3 NMH huma capa deve d
	% of women participation to trainings		Training reports	Beneficiaries	At closure	Country	Percentage	0	2025	30	2027	

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Link Outc / Out
# of trainings on surface-based station calibration		Implement training plan for staff in charge of surface based station calibration	Training reports	Beneficiaries	At closure	Country	Text	0	2025	1	2027	**Outc :** 1. GBO instit nal a huma capa deve d **Outp** 1.3 NMH huma capa deve d
	% of women participation to trainings		Training reports	Beneficiaries	At closure	Country	Percentage	0	2025	30	2027	
# of trainings for engineers/ technicians on UA installation, maintenance, operation, radio sonde operation		Implement training plan for staff in charge of UA installation, maintenance, operation, and radio sonde operation	Training reports	Beneficiaries	At closure	Country	Text	0	2025	1	2026	**Outc :** 1. GBO instit nal a huma capa deve d **Outp** 1.3 NMH huma capa deve d
	% of women participating to trainings		Training reports	Beneficiaries	At closure	Country	Percentage	0	2025	30	2026	
# of factory trainings for UA for engineers		Organise factory training for UA engineers	Training reports	Beneficiaries	At closure	Country	Text	0	2025	2	2026	**Outc :** 1. GBO instit nal a huma capa deve d **Outp** 1.3 NMH huma capa deve d
	% of women participating to trainings		Training reports	Beneficiaries	At closure	Country	Percentage	0	2025	30	2026	

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Link Outc / Out
Development of gender action plan			Annual report / semi-annual progress update	Policy	At closure	Country	Number	0	2025	1	2027	**Outc** : 1. GBO institi nal a huma capa deve d **Outp** 1.3 NMH huma capa deve d
	No components available.											
Development of Social and Environmental Safeguard plan			Annual report / semi-annual progress update	Policy	At closure	Country	Number	0	2025	1	2027	**Outc** : 1. GBO institi nal a huma capa deve d **Outp** 1.3 NMH huma capa deve d
	No components available.											

Risks

Event	Category	Level	Likelihood	Impact	Mitigating Measures	Risk Owner
Non-compliance with fiduciary and procurement standards in some SOFF activities	• Financial • Operational	Medium	Rare	Major	UNDP will undertake fiduciary assessment on the government of Madagascar and DGM to identify risk elements and prepare appropriate mitigation measures. UNDP will also undertake close supervision and monitoring of the project implementation through its country, regional and project teams from the Department of climate change and green growth.	
SOFF-funded investments cause environmental or social impacts	• Social and Environmental	Low	Unlikely	Minor	The Project activities are not expected to present any Environmental and Social Impacts and risks. However, UNDP will carry out a social and environmental screening process along project lifecycle as part of its rules for project implementation from inception to project closure.	

NMHS staff depart after being trained	• Organizational • Strategic	High	Likely	Major	SOFF Support will be used to build the capacity of DGM to manage its own budget and activities, including provision of information and services as well as better working conditions for staff i.e. Adequate equipment and working space needed provided for by DGM and partly by the project. The DGM will offer continuing service contracts, and organize regular refresher courses for trained staff.	
Slow implementation and delays in procurement, installation and capacity building activities	• Financial • Operational	Low	Unlikely	Minor	Realistic planning and strong support from UNDP's fiduciary team and Robust application of UNDP's procurement regulations. Adapt buffer zone within the 3 years of project.	
After the conclusion of the Investment phase, GBON data are not collected or shared or are shared of insufficient quality	• Financial • Operational	Medium	Rare	Moderate	The investment phase includes budget for operation and maintenance of the GBON equipment. This approach will help in smooth transition to the compliance phase. The compliance face is envisaged to support the proper functioning of equipment and data sharing. The capacity building in the investment phase will assist the beneficiary to develop its capacity to manage the operations of the equipment and data sharing.	

Destruction or theft of SOFF-financed equipment and infrastructure	• Financial • Operational	Medium	Unlikely	Moderate	The project has factored in the aspect of protection of the sites. The observation sites will be fenced and guarded to minimize the risk of theft. Through advocacy work and outreach programs the project will work with the local communities to enlighten them about the importance of project equipment and consequently guard them against theft Given the location of Madagascar it is very vulnerable to the impacts of climate change and likely susceptible to climate related disasters, there is a risk that the equipment could be destroyed by the natural hazard like the hurricanes. To mitigate this, the project will support the Standard operating procedures (SOPs) for equipment, including early action protocols in case of climate related hazards (this includes protective covers).	
Countries cannot make optimal use of data, including accessing or using improved forecasts products from the Global Producing Centers throughout the hydromet value chain	• Operational • Strategic	Medium	Unlikely	Moderate	To mitigate this, the project in partnership with CREWS Proposes extensive and comprehensive training for the DGM staff from the peer advisor and technical partners covering hydromet value chain. This will ensure that the country has enough capacity to make the optimal use of data including accessing or using improved focus products from the global producing center through the hydromet value chain	

Budget by UNSDG Categories: Over all

Budget Lines	Description	UNDP (7%) *	WMO (7%) *	Total
1. Staff and other personnel		$141,458.56	$0.00	$141,458.56
2. Supplies, Commodities, Materials		$691,965.14	$0.00	$691,965.14
3. Equipment, Vehicles, and Furniture, incl. Depreciation		$608,289.36	$0.00	$608,289.36
4. Contractual services		$2,459,106.05	$357,518.45	$2,816,624.50
5. Travel		$158,000.29	$0.00	$158,000.29
6. Transfers and Grants to Counterparts		$56,914.00	$0.00	$56,914.00
7. General Operating and other Direct Costs		$119,548.00	$0.00	$119,548.00
Project Costs Sub Total		**$4,235,281.40**	**$357,518.45**	**$4,592,799.85**
8. Indirect Support Costs		$296,469.70	$25,026.29	$321,495.99
Total		**$4,531,751.10**	**$382,544.74**	**$4,914,295.84**

Performance-based Tranches Breakdown

Tranche		Total

Results based budget

Outcome *	Output *	Agency *	Budget (USD) *
1. GBON institutional and human capacity developed		**Sub Total**	**$1,374,126.00**
	1.1 National Consultations conducted	UNDP (7%)	$43,000.00
	1.2 NMHS institutional capacity developed	UNDP (7%)	$552,328.21
	1.3 NMHS human capacity developed	UNDP (7%)	$421,279.34
	1.3 NMHS human capacity developed	WMO (7%)	$357,518.45
2. GBON infrastructure in place		**Sub Total**	**$2,621,618.50**
	2.1 New land- based stations in place	UNDP (7%)	$1,654,957.05
	2.2 Improved land-based stations in place.	UNDP (7%)	$199,800.00
	2.3 New upper-air stations in place.	UNDP (7%)	$766,861.45
3. Sustained compliance with GBON		**Sub Total**	**$597,055.35**
	3.1 GBON land-based stations commissioning period completed.	UNDP (7%)	$192,288.35
	3.2 GBON upper air stations' commissioning period completed.	UNDP (7%)	$404,767.00
Total			**$4,592,799.85**

Programme Outcome Costs

Outcome	Output	Activity	Implementing Agent	Time Frame		
				2025	2026	2027
				1	1	1
1. GBON institutional and human capacity developed						
	1.1 National Consultations conducted					
		Conduct national stakeholder consultations				
			UNDP	☑	☐	☐
			WMO	☑	☐	☐
	1.2 NMHS institutional capacity developed					
		Ensure continued collaboration with TAHMO in Data management and Data Transfer measures (GTS/WIS2.0 linkage, back-up system)				
			UNDP	☑	☑	☑
			WMO	☑	☑	☑
	1.3 NMHS human capacity developed					
		Mainstream gender tools within NMHS activities				
			UNDP	☑	☑	☑
			WMO	☑	☑	☑
		Ensure compliance with Social and Environmental Safeguard during project life-cycle				
			UNDP	☑	☑	☑
			WMO	☑	☑	☑
		Organise training for DGM staff and partners.				
			UNDP	☐	☑	☐
			WMO	☐	☑	☐

Outcome	Output	Activity	Implementing Agent	Time Frame		
				2025	2026	2027
				1	1	1
		Organize trainings on surface-based station installation and maintenance				
			UNDP	☐	☑	☑
			WMO	☐	☑	☑
		Organize trainings on surface-based station operationalization				
			UNDP	☐	☑	☑
			WMO	☐	☑	☑
		Organize trainings on surface-based station field verification				
			UNDP	☐	☑	☑
			WMO	☐	☑	☑
		Organize trainings on surface-based station calibration				
			UNDP	☐	☑	☑
			WMO	☐	☑	☑
		Organize trainings for engineers/ technicians on UA installation, maintenance, operation, radio sonde operation				
			UNDP	☐	☐	☑
			WMO	☐	☐	☑
		Organize factory trainings for UA for engineers				
			UNDP	☐	☐	☑
			WMO	☐	☐	☑
2. GBON infrastructure in place						
	2.1 New land- based stations in place					
		Operationalisation of New land-based stations and related equipment, ICT systems, data management systems and standard operating practices				
			UNDP	☑	☑	☑
			WMO	☑	☑	☑
		Setting Infrastructures for New land-based stations				
			UNDP	☑	☑	☑
			WMO	☑	☑	☑
		Setting specific equipment for new land-based close to airport				
			UNDP	☑	☑	☑
			WMO	☑	☑	☑
	2.2 Improved land-based stations in place.					
		Replacing 6 stations with new AWS				
			UNDP	☑	☑	☐
			WMO	☑	☑	☐
		Setting adequate infrastructures for 6 improved stations				
			UNDP	☑	☑	☐
			WMO	☑	☑	☐
		Improving ICT equipment and systems				
			UNDP	☑	☑	☐
			WMO	☑	☑	☐
	2.3 New upper-air stations in place.					
		Construction of ATEX compliant buildings				
			UNDP	☐	☐	☑
			WMO	☐	☐	☑
		Installation of one new upper air station				
			UNDP	☐	☐	☑
			WMO	☐	☐	☑
3. Sustained compliance with GBON						
	3.1 GBON land-based stations commissioning period completed.					
		Complete GBON land-based stations' commissioning period, establish country-specific standard cost for operations and maintenance, and verify data sharing by WMO Technical Authority				

Outcome	Output	Activity	Implementing Agent	Time Frame		
				2025	2026	2027
				1	1	1
			UNDP	☐	☐	☑
			WMO	☐	☐	☑
		Equipment of 5 maintenance Centres				
			UNDP	☐	☐	☑
			WMO	☐	☐	☑
	3.2 GBON upper air stations' commissioning period completed.					
		Complete GBON upper air stations' commissioning period, establish country-specific standard cost for operations and maintenance, and verify data sharing by WMO Technical Authority				
			UNDP	☐	☐	☑
			WMO	☐	☐	☑

Signatures

UNDP: UNDP (United Nations Development Programme (UNDP)) (Digital) Dr Edward Christow Resident Representative edward.christow@undp.org	**SIGNATURE:** Edward Christow **DATE:** 14-12-2024
WMO: WMO (World Meteorological Organization) (Digital) Celeste Saulo Secretary General csaulo@wmo.int	**SIGNATURE:** Celeste Saulo **DATE:** 03-03-2025