
SOFM Investment Funding Request

Cuba

Systematic Observations
Financing Facility

**Weather
and climate
data for
resilience**





General Information

Fund	MPTF_00281: The Systematic Observations Financing Facility					
FMP Record	MPTF_00281_00033: SOFF Cuba Investment Phase					
MPTFO Project Id						
Start Date						
End Date						
Applicants	Status	Contact Type	Name	e-mail	Position	Telephone
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Description	<p>Cuba is the largest Small Island Developing State (SIDS) in the Caribbean. It is characterized by its long and narrow geographic shape bordering to its north the Gulf of Mexico and the Bahamas Channel and to its south the Caribbean Sea, placing it within a hurricane cross road. It has an extensive surface for a SIDS totaling 109,884km², with long and irregular coasts including hundreds of small islands and keys extending for 6,073 kms.</p> <p>The country is currently operating 68 manual synoptic stations and 69 automatic surface weather stations (AWS). Of its 69 AWS stations, only 21 are operational. Currently no upper air radiosonde station is operational. The initial WMO GBON Global Gap Analysis prepared for Cuba had initially identified 2 surface stations and 1 upper air station required for improving while also recognizing that no stations were reporting to GBON.</p> <p>A closer assessment made during the readiness phase however presented an opportunity to revisit this initial value in large part due to the various geographical particularities related to island's extension and the existing large inequalities in width (ranging between 40 to 150 km). A situation that was made more complex due to the existence of numerous capes and entrances into the sea as well as to the island's diverse topology. This assessment allowed the peer adviser to conclude that the original distribution of stations calculated by square meters of the country's total surface was in fact not applicable to Cuba.</p> <p>The assessment conducted during the readiness phase revealed the following gaps in the context of Cuba (please refer to the National Contribution Plan):</p> <ol style="list-style-type: none"> 1. To meet GBON standard density, 9 surface stations (8 to be improved and a 1 new to be acquired) and 2 radiosonde stations, are in fact needed. 2. Sensors and data acquisition units must be updated. 3. Electrical supplies are required (installation of solar panels and batteries at all stations are needed). 4. A need to invest in the installation of communications interfaces via mobile telephony (3G/4G/5G) or VSAT as a backup is also required 5. Infrastructure needs for upper air stations is needed through small repairs to buildings where stations are and will be located. 6. A need to invest in the regionalization of maintenance services in the occidental (Havana) and eastern region (Camaguey) of the country. 7. The relevance and need to update and support the Instrument Calibration Center <p>The above minimum investments account for the actions included within the current SOFF proposal. The proposal recognizes that SOFF funds open the possibility to modernize Cuba's technological infrastructure thirteen years after the last investment was made in these. Particularly as currently INSMET's technological infrastructure presents problems of obsolescence and deficiencies to be able to fully deliver on its GBON obligations.</p> <p>The project will hence look to address the gaps as identified in the National Gap Analysis while leveraging existing opportunities for subregional gains, and taking advantage of national strengths as described within the National Contribution Plan for Cuba. These include the high level of the technical experts in terms of operation, maintenance and calibration of meteorological equipment as well as the existence of a Calibration Laboratory. Enhancing this laboratory could transform it into a regional reference center, offering calibration services to meteorological services in WMO Areas 3 and 4, particularly benefiting SIDS like Cuba and other SOFF project like Dominican Republic and Antigua and Barbuda. Investments as proposed in SOFF will also enhance GBON affiliation in the Caribbean by linking real-time meteorological data to lifesaving early warnings. Data from Cuba is crucial for better hurricane forecasts in the region.</p> <p>Further, it will allow the project to address the particular challenges faced by Cuba in accessing technological equipment and spare parts for operations and maintenance of its global observation equipment (in a current state of obsolescence in being able to meet GBON requirements) due to the ongoing imposed embargo by the United States to Cuba. These challenges represent logistical impediments in not only in accessing required equipment to maintain its stations but also in accessing services such as calibration for its equipment that may require going outside of the country as well as in making payments to service providers.</p> <p>Spain as member of CIMHET could ensure the continuity of the investment done and improve the observation capabilities of The Republic of Cuba with several training courses under the umbrella of CIMHET and support to maintain the infrastructure. While UNDP will further provide support through its existing nature, climate and disaster risk management portfolio that will work on enhancing capacities and integrating the national HydroMet network with environmental monitoring and early warning capacities.</p>				
Universal Markers	<table border="1"> <tr> <td data-bbox="579 2783 907 2799"> Gender Equality Marker </td><td data-bbox="907 2783 1900 2799"> Risk </td></tr> <tr> <td data-bbox="579 2799 907 2815"> <ul style="list-style-type: none"> • GEM1 - The Key Activity contributes to GEWE in a limited way </td><td data-bbox="907 2799 1900 2815"> <ul style="list-style-type: none"> • Low Risk </td></tr> </table>	Gender Equality Marker	Risk	<ul style="list-style-type: none"> • GEM1 - The Key Activity contributes to GEWE in a limited way 	<ul style="list-style-type: none"> • Low Risk
Gender Equality Marker	Risk				
<ul style="list-style-type: none"> • GEM1 - The Key Activity contributes to GEWE in a limited way 	<ul style="list-style-type: none"> • Low Risk 				

Optional Markers	WB Income Category	<ul style="list-style-type: none"> Upper Middle Income 					
	UN LDC	<ul style="list-style-type: none"> No 					
	Small Island Developing States (SIDS)	<ul style="list-style-type: none"> Yes 					
Fund Specific Markers	SOFF Phases	SOFF Phases <ul style="list-style-type: none"> Investment Phase 					
	EW4All	Early Warnings for All initial focus countries <ul style="list-style-type: none"> No 					
	Fragile and conflict-affected situation	Fragile and conflict-affected situation <ul style="list-style-type: none"> No 					
	Peer advisor	Peer advisor <ul style="list-style-type: none"> Agencia Estatal de Meteorología (AEMET) [Spain] 					
Geographical Scope	Geographical Scope	Name of the Region			Region(s)	Country	
	<ul style="list-style-type: none"> Country 				<ul style="list-style-type: none"> Americas 	<ul style="list-style-type: none"> Cuba 	
Participating Organizations and their Implementing Partners	UN Participating Organizations	Government/ Multilateral/ NGO/ Other			New Entities	Implementing Partners	
	<ul style="list-style-type: none"> UNDP - UNDP (United Nations Development Programme (UNDP)) WMO - WMO (World Meteorological Organization) 					UNDP, INSMET, AMA, CITMA, AEMET	
Programme and Project Cost	Participating Organization	Amount (in USD)		Comments			
	Budget Requested						
	UNDP	\$6,096,858.93		Includes 7% UNDP Fee (USD 398,859.93)			
	WMO	\$426,780.13					
	Total Budget Requested	\$6,523,639.06					
	Tranches						
	Tranche 1	Tranche 2		Tranche 3		Tranche 4	
UNDP (0%)	\$0.00	UNDP (80%)	\$4,877,487.14	UNDP (20%)	\$1,219,371.79	UNDP (0%)	\$0.00
UNDP (0%)	\$0.00	WMO (33.33%)	\$142,245.82	WMO (33.33%)	\$142,245.82	WMO (33.34%)	\$142,288.50
Total:	\$0.00	Total:	\$5,019,732.96	Total:	\$1,361,617.60	Total:	\$142,288.50
Other Sources (Parallel Funding)							
Total		\$6,523,639.06					
Thematic Keywords							
Programme Duration	Anticipated Start Date		01-Jun-2026				
	Duration (In months)		60				
	Anticipated End Date		01-Jun-2031				

Narratives

Title	Text

Close the most significant data gaps

The Cuban Institute of Meteorology (INSMET) is responsible for operating and maintaining 69 nationally deployed automatic meteorological stations (AWS) as well as 68 manual weather stations. Of the current Surface Synoptic-Climatic Meteorological Stations deployed throughout the country, these are made up of a measurement system with conventional instruments where observations are made by observers every three hours. In locations where an automatic weather station (AWS) is located observations are made every 10 minutes.

INSMET does not have an operational network of upper air observation stations.

Of the AWS only 21 are operational. Out of the 21, only 14 are currently reporting data via WIS 2.0 (prior to June 2024, the number was 12). However it was only until this year that the data was able to be received by the WIGOS Data Quality Monitoring System platform. This had not been possible before as the system had not been updated and was unable to emit transmissions via GTS. While these stations are now transmitting data, as of today their outputs do not meet the quality criteria established by GBON due to the obsolescence of their instrumentation and the lack of spare parts for maintenance.

It is important to note however that the fact that these are transmitting through WIS2.0 demonstrates that the current data transmission mechanism is functional and that the technical expertise to implement it with the remaining stations exists within the country, thus demonstrating the relevance of investing in instrumentation and equipment parts.

Equipment Needs

The main gaps reported in the GBON National Gap Analysis and national contribution plan can be summarized as follow:

1. Sensors and data acquisition units must be updated.
2. A complete AWS must be installed, including civil works in Santiago de Cuba.
3. Electrical supplies are required including the installation of solar panels and batteries at all stations as well as protection against lightning (in the case of the solar panels).
4. The need for the installation of communications interfaces via mobile telephony (3G/4G/5G) or VSAT as a backup. (financed by INSMET) to update AWS communication hardware.
5. The need to allocate funds for infrastructure, in particular small repairs in the buildings for the upper air stations
6. The relevance of regionalizing maintenance services in the western (Havana) and eastern parts (Camaguey) of the country
7. The relevance of updating the current Instrument Calibration Center
8. Investment in 9 surface stations (improving 8 and 1 new) and 2 radiosonde stations (Table 1).

The WMO GBON global gap analysis for Cuba developed in June 2023 originally identified only 2 surface stations and 1 upper air station for improving. However in light of the geographical characteristics of the country, during the GBON readiness phase, it was concluded that 9 surface stations and 2 upper air station should in fact be included to be part of the Cuban GBON network

Table 1. GBON National Contribution Target

Type of station	WMO Global Gap Analysis June 23				GBON National Contribution Target	
	Target	Reporting	Gap		Improve	New
			Improve	New		
Surface	2	0	2	0	8	1
Upper Air	1	0	1	0	0	2

Of the 9 proposed stations, one is proposed to be newly installed and the remaining 8 are proposed to be upgraded. In 5 of the 8, a partial rehabilitation of the equipment is needed, and in the remaining 3 a complete rehabilitation is required to fulfill GBON requirements.

From the eight to be improved, 7 are proposed to be fully covered within the SOFF project while 1 will be supported through co finance funds (UNDP/GCF project "Mi Costa"), see below table for location and station type.

Table 2 Name and Coordinates of the stations

Stations	Coordinates		Station Type
	Lat N	Long W	(Surface/ Upper Air)

Isabel Rubio	22.14833	-84.11444	S
La Fe	21.73333	-82.75722	S
Varadero	23.15916	-81.23083	S
Playa Girón	22.07111	-81.03222	S
Sancti Spíritus	21.96972	-79.44805	S
Santa Cruz del Sur	20.73722	-78.00055	S
Puerto Padre	21.20888	-76.61611	S
Micro 3	20.04333	-71.81722	S
Punta de Maisí	20.24166	-74.14611	S
Camagüey	21.42250	-77.84972	UA
Mariel	TBD	TBD	UA

The technical evaluation of the surface stations identified to be part of the GBON network indicated that 8 of the stations have AWS that needs to be upgraded and 1 station, Micro 3 (in Santiago de Cuba), must be built entirely from its foundations. It was also found that 5 of the 8 stations mentioned above are working and therefore have dataloggers whose transfer protocol is TCP/IP, while the remaining 3 stations use the FTP transfer protocol, because the AWS are damaged, and they carry out observations with conventional (manual) instruments.

Instrument Calibration Center.

Sensors installed in the field face very different environmental conditions than those found in a controlled laboratory environment. In the case of Cuba, high humidity levels and salinity in the air are present especially in coastal stations: Sensors used under those conditions require higher frequency of maintenance and calibration than those installed in a less aggressive environment.

The calibration of meteorological sensors in Cuba is the responsibility of INSMET which operates a calibration laboratory created in the 1970s with funding from UNDP within the project "Expansion and improvement of the meteorological service of Cuba" and which had the technical advice of WMO.

This laboratory's mission is to guarantee traceability of surface meteorological observations for magnitudes like temperature, air humidity, barometric pressure, and wind speed. In 2009, this laboratory renewed its calibration chambers and standards as part of an International Collaboration Project with China, and acquired a wind tunnel the following year. However, except for the wind tunnel, laboratory requires updating some of its equipment, which has been in operation for 15 years. During these years, INSMET has managed to maintain traceability of its standards to SI, sometimes financed by Voluntary Cooperation Programs of WMO or by International Collaboration Projects led by UNDP.

INSMET would be in a very difficult situation to operate Cuba GBON network, and to continue maintaining the traceability of its measurements to SI, if it was not able to continue to rely on its calibration laboratory in the future. Currently the shipment of INSMET sensors to laboratories abroad is extremely difficult due to US embargo faced by Cuba that does not allow for the transportation of equipment to receive calibration services in nearby countries (risk of equipment being seized or lack of capacity to process payments in currencies other than USD or that rely on US financial service intermediaries). This results in delays in calibration as well as added expenses as equipment must be calibrated in Asia or Europe. Because of that, Cuba's GBON National Contribution Plan proposed to strengthen the country's existing calibration laboratory (update its essential technology, improve its infrastructure and train personnel to maintain the quality and reliability of measurements) while identifying an opportunity to transform it into a Regional Laboratory at the service of the WMO member countries in the area.

Target easy fixes

The SOFF project in Cuba will benefit from an existing high level of the technical expertise within Cuba as it relates to the operation, maintenance and calibration of meteorological equipment, that would be able to benefit from the access to spare parts and equipment for the long term maintenance of investments made through SOFF.

The quick wins that could be explored under SOFF to close the above identified gaps and rapidly deliver on GBON data sharing are as follows:

- Updating 8 surface stations that are reporting data via WIS2.0 internationally..
- Installing 1 new surface station to complete horizontal resolution for complying with GBON requirements.
- Installing 2 new upper-air stations to comply with 500 km resolution for this type of stations proposed by NCP.
- Upgrading the Instrument Calibration Center. A replacement of pressure calibrator would be necessary as it currently requires spare parts due to breakdown and is unreliable. To have a simple development for calibration of the tipping bucket rain gauges, as well as improving the climate chamber would enhance standards and guarantee the traceability. The instrument management system complies with ISO 17025. A replacement of the pressure calibrator would be required as it is currently defective. In the case of the climatic chamber, a replacement is also necessary due to the number of years of its operation, which has caused various technical problems that prevent the full exploitation of its capacities. It is necessary to incorporate a system for the calibration of the bucket rain gauges. The wind tunnel is functional and only needs maintenance. Instrumentation to perform field calibrations needs to be acquired.

The Calibration Laboratory represents a quick win for the project. It complies with the ISO 17025 standard, and where its technical staff is the same staff in charge of the installation and maintenance of automatic weather stations, some with more than 20 years of experience in datalogger configuration and calibration of sensors of different manufacturers. These personnel could participate in future exchanges with different countries in the region to support the implementation of their SOFF projects and provide installation, maintenance and calibration services for meteorological stations where required. Enhancing this laboratory could transform it into a regional reference center, offering calibration services to meteorological services in WMO Areas 3 and 4, particularly benefiting SIDS like Cuba and other SOFF project like Dominican Republic and Antigua and Barbuda. This would help lower calibration costs by avoiding the need to send equipment overseas and generate income, making the operation and maintenance of the measurement network more sustainable.

Institutional and Human Capacity Development

It is also important to note that INSMET owns all the stations, each of which has 24-hour support staff and is situated near Territorial Meteorological Centres that can offer initial maintenance support. INSMET will handle the salary expenses for all personnel working at the stations and maintenance and calibration centres. Additionally, they will cover electricity, security, and communication services among other needs.

An easy fix would be to adopt a regionalization strategy. Establishing two maintenance centers, one in Havana and another in Camaguey, can lower both operation and maintenance expenses while ensuring the network remains operational without interruptions. This will be particularly advantageous during hurricane season, as it will enable prompt reactivation of the network in the event of failures. Conversely, many users in the country require improved meteorological data for activities like port management, pollution tracking, solar energy, tourism, and agriculture. INSMET can develop tailored services for these sectors, using the revenues to sustain the network.

Create leverage

From 1970 Cuban Meteorological Service has received investment from several donors:

- In 1970, under the UNDP project "Expansion and improvement of the meteorological service in Cuba", acquired new equipment increasing the number of stations to 68, a calibration laboratory was installed, and education and training initiatives were made. These stations continue to be operational, although requiring support in their upgrade.
- In 2010, additional AWS were acquired, and the Calibrations Laboratory was also renovated. INSMET has improved some AWS with the participation in other international projects, including those supported by UNDP.

INSMET staff has received training in all these initiatives, which has allowed them to have the necessary knowledge to perform calibration and maintenance of the network of stations. However, with the SOFF project, new technicians will be trained to increase this capacity, especially in the second maintenance center located in the eastern region.

Further, SOFF investment opens the possibility to modernize Cuba's technological infrastructure thirteen years after the last investment. Currently, INSMET's technological infrastructure presents problems of obsolescence and deficiencies to be able to fully support the services it provides as well as to fully deliver on its GBON obligations. Spain as member of CIMHET could ensure the continuity of the investment done and improve the observation capabilities of The Republic of Cuba with several training courses under the umbrella of CIMHET and support to maintain the infrastructure.

UNDP will further provide support through its existing nature, climate and disaster risk management portfolio that will work on enhancing capacities and integrating the national HydroMet network with environmental monitoring and early warning capacities including through the GCF funded adaptation project (Mi Costa). The GCF Mi Costa project is currently providing support for the delivery of environmental information linked to coastal resilience. It is currently working with INSMET in the packaging of climate information products towards this end. Mi Costa project will be supporting the acquisition of a full new Automatic Weather Station (sensors and other components) to replace the old automatic weather stations located in Santa Cruz del Sur in Camaguey province. While the project is focused on ecosystem restoration for coastal resilience, an estimated USD 290,000 will be provided to INSMET.

It is expected that the CREWS Readiness Project will be approved in 2025 (USD 250,000), with the investment proposal being sent for approval in 2027.

Investments from SOFF will further enhance this work while ensuring GBON compliance and providing tangible sub regional benefits.

The project will further leverage knowledge and capacities derived for recently completed EUROCLIMA project that focused on hydrological analysis within the province of Ciego de Avila. Coordination has also been ensured with the CREWS Readiness Initiative "Improving Hydromet Information and EW for the Energy and Disaster Risk Reduction Sector in Cuba" that is currently under formulation. In this case, SOFF will provide the baseline foundation for INSMET through GBON required and compliant observation equipment and capacities while CREWS (upon approval of the full investment proposal) will provide support to INSMET in enhancing its capacities to develop climate products and services for the energy and DRR sectors.

Cuba is not included directly in CREWS Caribbean 2.0, Project, however this project proposal recognizes that strengthening and streamlining a CARICOM regional MHEWS will necessitate effective collaboration between and potential inclusion of other Caribbean states, where Cuba is included.

Maximize delivery capacity

UNDP

UNDP is the largest resident United Nations agency in the country with more than 50 years of work experience, and with a strong partnership with the Ministry of Science, Technology and Environment (CITMA) and the National Institute of Hydraulic Resources (INRH), that positions it with a strong comparative advantage for SOFF implementation. For over two decades UNDP has played a crucial role in enhancing the country's hydrometeorological surveillance and monitoring systems. This has been achieved through the transfer of technology for data acquisition and processing, which has helped improve weather forecasting systems and decision-making as part of early warning system

UNDP has a strong national cooperation portfolio in natural resources management, climate change adaptation and Disaster Risk Management. The country program document (CPD) 2020 – 2024 applies an integral and holistic programmatic approach between natural resource management, climate change, disaster risk reduction, social development and governance support.

UNDP provides substantial technical and operational support to the country, including procurement related support services particularly as it relates to technical equipment for observation systems that will be important for SOFF.

Currently, UNDP is working together with CITMA in an initiative financed by the Green Climate Fund, "Mi Costa", to enhance resilience to climate change in the southern coast of Cuba, with a strong focus on environmental and hydrometeorological monitoring in 7 provinces of the country. The UN system is also supporting the Euroclima+ Program (financed through the French Development Agency) to expand the coverage of the hydrometeorological surveillance and monitoring system in two provinces of the country and to increase resilience to drought and floods in a climate change context. UNDP will look to ensure complementarity with these projects.

AEMET

AEMET has long experience in management AWS networks, calibration, data transmission and maintenance. It has long experience supporting countries in Central and South America. Under CIMHET, AEMET has organized, or has led training courses related to Calibration and Maintenance of AWS, Satellite applications, communications, forecast, NWP and GHG Monitoring. AEMET will keep the leadership in Iberoamerican countries for training courses under the Regional Training Center (RTC). The main strategic topics will be, Management and leadership, GHG Monitoring, NWP use for Tropical Area, Satellite Meteorology, Climate Change, Climate Services, Meteorological Radar and applications, Meteorology and Health.

Sub-regional gains

Cuba, due to its geographical location in Latin America and the Caribbean, plays a crucial role in the region's meteorology. The island is strategically positioned, making it vulnerable to a variety of meteorological phenomena, including hurricanes, cold fronts, and droughts. These events not only affect Cuba but also have significant repercussions for the rest of the Latin America and the Caribbean. Cuba is also a leading researcher on climate science for the region, providing valuable information that is relevant beyond Cuba.

The Institute of Meteorology of Cuba (INSMET) is a key institution in the region, providing forecasts and early warnings that are essential for disaster preparedness and response. INSMET's ability to monitor and predict these meteorological events has been fundamental in mitigating the impacts of disasters not only for Cuba but also for other countries in the regions.

INSMET has a long tradition of collaboration with other NMHSs in the region, especially with ONAMET of the Dominican Republic, which is also currently in a similar process of designing the SOFF project, and with the Haitian Meteorological Service (UHM). INSMET maintains collaboration with WIGOS Regional Centre, which is a prominent example of how strategic alliances can drive significant advances in specialized fields such as meteorology and climatology.

Investments through SOFF will enhance GBON affiliation in the Caribbean by linking real-time meteorological data to lifesaving early warnings, particularly as data from Cuba is crucial for better hurricane forecasts in the region.

The rehabilitation of the calibration laboratory will result in improving collaboration while reducing costs for SOFF projects across the Caribbean. Once operational the calibration laboratory can serve as a training and technology transfer center for other Latin America and the Caribbean countries. Technicians and scientists from the region can receive training in calibration and maintenance techniques, which will strengthen local capacities and promote self-sufficiency for the region in meteorological data management.

SOFF Beneficiary Country Capacity Assessment

INSMET operates under the supervision of the Environmental Agency of the Ministry of Science, Technology, and Environment of Cuba. Its main mission is to provide authorized, reliable, and timely meteorological and climatic information about the current state and future behavior of the atmosphere. This information is aimed at ensuring human safety and reducing material losses from meteorological natural disasters, directly contributing to community well-being and sustainable development.

To fulfill its mission, the Institute of Meteorology operates the Meteorological Service as a National System and carries out an extensive research plan to improve its service and contribute to the development of scientific knowledge in meteorology.

INSMET is responsible for operating and maintaining the 69 Surface Synoptic-Climatic Weather Stations and the 69 AWS deployed throughout the country. As of December 30, 2023, INSMET has a staff of 1,342 people, as follows:

Staff Type	Number
Mgmt	59
Met	278
Met Technician	402
Hydro	0
Hydro technician	0
climate services	221
researcher	67
other	315
total staff (male and female)	1,342 (M 859; F 453)

The weather prediction system of INSMET is made up of the Weather Forecasting Centre (CPT), located at the INSMET headquarters, which is responsible for issuing warnings, and seven regional forecast groups located in each of the provinces. These groups are in operational contact with the CPT, with regular videoconferences, which present some problems in the quality of connections. The current staff of the CPT is 22 people, divided into 4 daily H-24 shifts as well as research staff. The provincial forecasting groups each have a staff of 7 forecasters. For more details, refers to the Country Hidromet Diagnostic Report.

For the real time operations of the stations, INSMET personnel on site 24h/day, performs daily preventive maintenance and manual synoptic observation every 3h providing complementary data on visibility, clouds, etc. They can also provide immediate response and performing basic checks in case of breakdowns.

INSMET has contracts with national companies that can install and maintain grounding and lightning protection systems, photovoltaic modules and generators.

Investment Phase Alignment with the GBON National Contribution Plan

Investment Phase Alignment with the GBON National Contribution Plan

There is not differences between the targets proposed in the Investment phase and recommendations from the National Contribution Plan which was concluded in the readiness phase. All activities have been included to enhance the capacity of the NHMS for better operation and maintenance of the infrastructure for easy integration with existing interventions. Other activities for improving capacities of the NHMS personnel were also included.

The investment phase proposal includes all activities and recommendations from the National Contribution Plan.

GBON National Gap Analysis as Annex 1

GBON National Contribution Plan as Annex 2.

Execution model and implementation arrangements

The project will be implemented following UNDP's support to national implementation modality (Support to NIM) - according to the SBAA, the Country Program Document (CPD) 2020-2026 and as per policies and procedures outlined in the UNDP (POPP) (see: <https://popp.undp.org/SitePages/POPPSubject.aspx> SBJID=245&Menu=BusinessUnit).

The Implementing Partner for this project is the Institute of Meteorology ascribed to the Environmental Agency (AMA) of the Ministry of Science, Technology and Environment (CITMA) of Cuba.

The Implementing Partner has full responsibility and accountability for the effective use of resources and the delivery of outputs as set forth in this proposal. UNDP is accountable to the donor for the implementation of this project. This includes project execution and oversight to ensure that the project is being carried out in accordance with agreed standards and provisions. UNDP is responsible for delivering the donor project cycle management services comprising project approval and start-up, project supervision and oversight, and project completion and evaluation. UNDP is responsible for the Project Assurance role of the Project Board/Steering Committee.

UNDP will handle the procurement processes for goods, as well as the hiring of consulting services and other activities related to training, equipment installation, and monitoring missions. These processes will be carried out in accordance with the technical requirements of the counterparts and under the norms and procedures of UNDP, which can be consulted at UNDP Policies and Procedures: <https://popp.undp.org/>.

A national project document will be prepared in compliance with the country's regulations and the UNDP standards and following the National Contribution Plan and the Investment Funding Request.

This project document must include all investment activities and compliance schedules. Once prepared, it will be submitted to the Ministry of Foreign Trade of Cuba, the regulatory entity for cooperation in the country, for approval.



To ensure success, monitoring mechanisms will be established based on UNDP rules and regulations, and in consultation with INSMET. Additionally, the project will develop annual work plans that will be updated, identifying challenges and mitigation measures for achieving the established goals as set forth in this proposal. UNDP will maintain regular contact with INSMET to facilitate systematic exchanges and monitor project implementation.

UNDP will receive funds from MPTF per UNDP Rules and Regulations (<https://popp.undp.org/document/operating-guidelines-mptf-projects-implemented-undp-country-offices>) ensuring mechanisms for reporting and tracking of financial resources.

The Spanish Meteorological Agency (AEMET).

AEMET will collaborate with UNDP to provide technical advisory services to support INSMET in implementing the National Contribution Plan and agreed activities for the Investment Phase.

During the SOFF Investment Phase, AEMET will also be engaged in the following activities as a peer advisor:

- Assistance with technical aspects of AWS bidding procedure.
- Assistance with technical aspects of radiosounding bidding procedure.
- Assistance with technical aspects of IT bidding procedure.
- Assistance for creating capacity buildings and enhancing skills to operate AWS and radiosounding:
- Training on technical aspects, for example, observations, data management, data exchange and WDQMS
- Training on AWS and radiosounding lifecycle maintenance and calibration.
- Guidance on radiosounding and AWS data transmission and handling.
- Advice on implementing a data management system.
- Contribution to final reporting.

Private sector involvement	<p>Through the SOFF initiative, efforts will be made to expand the partnership between INSMET and the private sector (. These efforts will explore mechanisms to support the implementation of the SOFF Investment Program, as appropriate. This will include identifying areas of value to private sector actors including tourism operators, agriculture enterprises and energy sector as relevant.</p> <p>As project investments would provide the means to improve weather and climate forecasts (due to the progressive improvement of global models), INSMET would be able to leverage this opportunity to expand its portfolio of services and strengthen existing links with national sectors that traditionally benefit from meteorological data services and encourage the inclusion of new economic actors in said catalogue.</p> <p>Exploring the possibility of incorporating private sector operators into the project, through MSMEs (Micro, small and medium-sized enterprises and voluntary observers), especially small farmers, will undoubtedly mark one of the challenges of this project. In this sense, INSMET can provide useful and updated meteorological and climatological information for their daily work, as well as advise on the acquisition of meteorological equipment for this sector, while MSMEs and TCPs (Self-employed workers) can provide support in software development and the acquisition of spare parts, as well as providing data to INSMET.</p> <p>Finally, with the gradual improvement and updating of the calibration laboratory, INSMET would be able to restart the provision of services to national and international entities and individuals interested in calibrating and repairing instruments in the variables measured in GBON, thus providing an opportunity for cost recover and long term sustainability that benefits not only Cuba but also subregional actors.</p>
Civil society participation	<p>INSMET, as a governmental institution, complies with the requirements established by the government regarding the inclusion of civil society in its activities. The composition of individuals at all levels of organization within this institution is diverse, including variations in academic background, race, gender, and more.</p> <p>Meteorology in Cuba holds a certain level of relevance earned through the merits of various specialists who fulfill this role in society over the years. Additionally, the government places significant importance on preparedness to prevent risks and disasters related to extreme meteorological phenomena. Timely dissemination of information through all mass media channels further strengthens the connection between INSMET and all Cuban civil society organizations.</p> <p>In most municipalities in Cuba, the locations where different meteorological stations are situated serve as hubs for scientific development in the region. Throughout the year, various activities take place to promote environmental care and protection, scientific advancement, innovation, and community engagement.</p> <p>Both INSMET and UNDP have excellent relationships with various Cuban civil society organizations. In this project, both institutions will work together to involve civil society in identifying its potential contribution to the GBON. This collaborative effort aims to raise awareness about the different aspects encompassed by GBON, with a primary objective of strengthening partnerships with all civil society organizations and the private sector.</p>
Fiduciary systems	<p>UNDP will prepare a Project Document (PRODOC) that outlines the work schedule during the implementation phase and the budget allocated for each activity, as approved by SOFF in the Contribution Plan. Additionally, it will define the monitoring and evaluation mechanisms to be followed, as well as implementation arrangements. The roles of participating entities, including beneficiaries and national institutions related to the project's objectives (such as MINCEX (Ministry of Foreign Trade of Cuba), INSMET, and Provincial Meteorological Centers), will be specified. The PRODOC will also address project risks, mitigation measures, and environmental safeguards.</p> <p>The PRODOC will be signed by MINCEX on behalf of the beneficiaries. Subsequently, INSMET will develop the national Terms of Reference (TOR), which must be signed by all participating entities in the project. The TOR will define the roles of project participants, their corresponding activities, and the goods to be acquired. This document will also include the local financial contribution to the project. Therefore, the TOR establishes the commitment of project participants to achieving the set objectives.</p> <p>UNDP will receive funds from MPTF per UNDP Rules and Regulations (https://popp.undp.org/document/operating-guidelines-mptf-projects-implemented-undp-country-offices) ensuring mechanisms for reporting and tracking of financial resources.</p> <p>To implement any partnership, UNDP ensures that clear and robust fiduciary arrangements are in place before the implementation starts. These include financial management and procurement aspects which enable transparency, accountability, and effectiveness in the utilisation of funds mobilised.</p>

Social and environmental safeguards	<p>UNDP follows norms that require an analysis of environmental and social safeguards, which must be conducted and approved before project implementation begins. Social and environmental sustainability will be reinforced through the application of UNDP's Social and Environmental Standards, which can be accessed at UNDP SES Standards at http://www.PNUD.org/ses. A Social and Environmental Screening Procedure will be applied during project document formulation to identify possible ESS risks and they management measures.</p> <p>Additionally, UNDP has a well-defined gender policy that is integrated across all project results. The Country Office has consistently achieved the Gold Gender Seal for the past 4 years, making it one of the few countries in the region to receive this distinction awarded by UNDP Global.</p> <p>INSMET will strive to minimize the environmental impact of observation technologies and comply with GBON. Surface observation networks will be designed, implemented, and operated with the goal of having sustainable meteorological and climatic observation systems. Altitude consumables will adhere to environmental regulations for batteries, packaging, and hazardous substances, considering the use of biodegradable packaging whenever possible.</p> <p>Additionally, INSMET will consider using instruments that allow for the replacement of subcomponents or subsystems instead of discarding the entire instrument.</p> <p>Efforts to ensure gender equality in the promotion of meteorological and climatic services will continue and will be enhanced through project implementation by providing an opportunity for targeted technical support to women technicians. INSMET will collaborate with project partners and stakeholders to promote gender equality in meteorology, actively ensuring gender equity as an integral part of the project.</p> <p>Following recommendations from the WMO Infrastructure Technical Commission, project partners will work to develop strategies for promoting gender balance in project activities. Specifically, they will take active measures to ensure that capacity development opportunities, participation in coordination activities, and visibility of gender contributions encourage young female scientists to engage with meteorology and climate sciences.</p> <p>Gender considerations have been included in the results framework to ensure that there is at least 50% female representation in capacity development activities.</p>
Dispute resolution mechanism	<p>The conflict resolution policy should be established in the agreement signed between UNDP and WMO. Both parties will make every effort to resolve any disputes, controversies, or claims through conciliation and in accordance with established norms for such cases. UNDP has mechanisms in place for consultations and has created spaces for reconciling differences with project stakeholders.</p> <p>As the implementing agency, UNDP will adhere to the policies, procedures, and practices of the United Nations Security Management System and the Accountability Mechanism, which can be accessed at http://www.pnud.org/secu-srm</p> <p>UNDP will ensure that relevant organizations and stakeholders are well-informed about the existence of the Accountability Mechanism and have access to it.</p>
Additional relevant policies and procedures	<p>UNDP has a robust Programme and Operational Policies and Procedures (POPP) framework. This framework provides comprehensive guidance for project and programme implementation, ensuring effectiveness, transparency, and accountability in all operations. When considering the context of implementing entities, especially when UNDP is working in partnership with the INSMET, UNDP POPP will guide the SOFF national implementation.</p>

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	Description
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
Secondary Goals	
Goal 5. Achieve gender equality and empower all women and girls	
TARGET_5.5	5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life

SDG Indicators

Indicator Code	Description
No data available.	

Contribution to SDGs

Participating Organization	% TARGET_13.1	% TARGET_13.2	% TARGET_13.3	% TARGET_13.b	% TARGET_5.5	% Total
UNDP	35	10	10	35	10	100
WMO	35	10	10	35	10	100
Total contribution by target	70	20	20	70	20	
Project contribution to SDG by target	35	10	10	35	10	100

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			
Title	Description	Lead Participating Organization	Participating Organization	Other Organizations	
Conduct national workshops with consulting activities with civil society organizations and stakeholders.	UNDP - UNDP (United Nations Development Programme (UNDP))	• WMO - WMO (World Meteorological Organization)	CITMA, INSMET		
	1.2 NMHS institutional capacity developed	NMHS institutional capacity required to operate the GBON network developed.			

Outcome	Output	Description			
	Activities				
	Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
	Develop an instruction manual that should be in line with the standard operating procedures (SOPs)		UNDP - UNDP (United Nations Development Programme (UNDP))	• WMO - WMO (World Meteorological Organization)	INSMET
	Develop capacities for the institution's senior management staff, as described in Table 44 of the National Contribution Plan.		WMO - WMO (World Meteorological Organization)	• UNDP - UNDP (United Nations Development Programme (UNDP))	INSMET
	1.3 NMHS human capacity developed	NMHS human capacity required to operate the GBON network developed.			
	Activities				
	Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
	Develop capabilities for the institution's technical personnel to correctly operate surface and radiosonde stations, as described in Table 44 of the National Contribution Plan.		UNDP - UNDP (United Nations Development Programme (UNDP))	• WMO - WMO (World Meteorological Organization)	INSMET
	Conduct national workshops for continuous training of the institution's human resources.		UNDP - UNDP (United Nations Development Programme (UNDP))	• WMO - WMO (World Meteorological Organization)	INSMET
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.			

Outcome	Output	Description			
	Activities				
	Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
	Procurement of materials and equipment for the new station.		UNDP - UNDP (United Nations Development Programme (UNDP))		INSMET
	Identification, evaluation and preparation of the new station.		WMO - WMO (World Meteorological Organization)	• UNDP - UNDP (United Nations Development Programme (UNDP))	INSMET
	Preparation of the equipment for installation in the new station.		UNDP - UNDP (United Nations Development Programme (UNDP))	• WMO - WMO (World Meteorological Organization)	INSMET
	Installation of the new station and other activities necessary for the completion of the observation system in the new station.		UNDP - UNDP (United Nations Development Programme (UNDP))	• WMO - WMO (World Meteorological Organization)	INSMET
	Update of the infrastructure and power sources of the INSMET ICT as well as its telecommunications and data management services.		UNDP - UNDP (United Nations Development Programme (UNDP))	• WMO - WMO (World Meteorological Organization)	INSMET
	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.			

Outcome	Output	Description			
	Activities				
	Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
	Procurement of materials and equipment for the 8 rehabilitated stations		UNDP - UNDP (United Nations Development Programme (UNDP))		INSMET
	Identification, evaluation and preparation of the 8 rehabilitated stations.		UNDP - UNDP (United Nations Development Programme (UNDP))	• WMO - WMO (World Meteorological Organization)	INSMET
	Installation of the equipment in the 8 rehabilitated stations including all the relevant necessary activities for the incorporation of the rehabilitated stations into the observing system		UNDP - UNDP (United Nations Development Programme (UNDP))	• WMO - WMO (World Meteorological Organization)	INSMET
	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.			

Outcome	Output	Description			
	Activities				
	Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
	Procurement of materials and equipment for the new station.		UNDP - UNDP (United Nations Development Programme (UNDP))		INSMET
	Identification, evaluation and preparation of the new station.		UNDP - UNDP (United Nations Development Programme (UNDP))	<ul style="list-style-type: none"> • WMO - WMO (World Meteorological Organization) 	INSMET
	Preparation of equipment for installation at the new station.		UNDP - UNDP (United Nations Development Programme (UNDP))	<ul style="list-style-type: none"> • WMO - WMO (World Meteorological Organization) 	INSMET
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	

Outcome	Output	Description				
	Activities					
	Title	Description		Lead Participating Organization	Participating Organization	Other Organizations
	Enhance the capacity of the calibration laboratory to allow it to preform calibration to the GBON equipment.	Spare parts to allow for reparation of equipment and ensure its long term capacity to provide calibration services to ensure GBON compliance.		UNDP - UNDP (United Nations Development Programme (UNDP))	<ul style="list-style-type: none"> WMO - WMO (World Meteorological Organization) 	INSMET
	Strengthen the National Maintenance Technical Center and create a second Maintenance Support Technical Center			UNDP - UNDP (United Nations Development Programme (UNDP))	<ul style="list-style-type: none"> WMO - WMO (World Meteorological Organization) 	INSMET
	Acquisition of materials and tools for maintenance and calibration			UNDP - UNDP (United Nations Development Programme (UNDP))	<ul style="list-style-type: none"> WMO - WMO (World Meteorological Organization) 	INSMET
	Activities to perform calibration and maintenance			UNDP - UNDP (United Nations Development Programme (UNDP))	<ul style="list-style-type: none"> WMO - WMO (World Meteorological Organization) 	INSMET
	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					
	Title	Description		Lead Participating Organization	Participating Organization	Other Organizations
	Maintenance operational actions for UA station (costs associated to OM)			UNDP - UNDP (United Nations Development Programme (UNDP))	<ul style="list-style-type: none"> WMO - WMO (World Meteorological Organization) 	INSMET
	Acquire spares and consumables			UNDP - UNDP (United Nations Development Programme (UNDP))		INSMET

Signature Indicators

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Lin Ou / O
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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	2026	1	2031
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	2026	8	2031
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	2026	2	2031
GBON land-based stations' commissioned		Number of stations as defined in the National Contribution Plan.		Policy	At closure	Country	Number	0	2026	9	2031

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year
GBON upper air stations' commissioned		Number of stations as defined in the National Contribution Plan.		Policy	At closure	Country	Number	0	2026	2	2031

Project Indicators

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year
Number of national workshops with consultancy activities involving civil society organizations and stakeholders		At least 50% of workshop participants must be women	Workshop report	Capacity	At closure	Country	Number	0	2026	3	2031
	Gender	At least 50% of all workshop participants must be women	Workshop report and attendance list	Other	At closure	Country	Percentage	0	2026	50%	2031
Number of senior management members trained				Capacity	At closure	Country	Number	0	2026	6	2031

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year
	Gender	At least 50% of all workshop participants must be women	Training report and attendance list	Capacity	At closure	Country	Percentage	0	2026	50%	2031
Instruction manual developed and approved		1 will be developed	Completed and approved instruction manual	Policy	At closure	Country	Number	0	2026	1	2031
No components available.											
Number of technical personnel trained to operate GBON network		At least 50% of all workshop participants must be women	Training reports, attendance lists, capacity assessments	Capacity	At closure	Country	Number	0	2026	39	2031
	Gender	At least 50% of all workshop participants must be women	Training reports, attendance lists,	Capacity	At closure	Country	Percentage	0	2026	50%	2031
# of training and workshops conducted			Training reports and annual reports	Capacity	At closure	Country	Number	0	2026	4	2031

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year
	Gender	At least 50% of all workshop participants must be women	Training reports, attendance lists, and annual reports	Capacity	At closure	Country	Percentage	0	2026	50%	2031

Risks

Event	Category	Level	Likelihood	Impact	Mitigating Measures			Risk Owner
Non-compliance with fiduciary and procurement standards in some SOFF activities	• Operational	Medium	Unlikely	Major	UNDP, at the request of INSMET, will be in charge of procurement processes. UNDP has strict corporate financial and procurement procedures as well as fiduciary systems which will be used and adhered to at all levels.			UNDP
SOFF-funded investments may cause minor environmental or social impacts, particularly in the installation of equipment where minor works may be required	• Social and Environmental	Low	Unlikely	Minor	UNDP will apply its Social and Environmental Standards (SES) to ensure social and environmental sustainability. The SES policy of UNDP can be consulted at http://www.PNUD.org/ses			UNDP
INSMET staff depart after being trained	• Operational • Organizational • Strategic	High	Possible	Major	The UNDP will manage, with INSMET and AEMET, the training actions related to the proposed goals. INSMET will enhance the capabilities of its technical staff and decision-makers to ensure the sustainability of the personnel training actions. This will include establishing manuals for operation and anchoring with national training institutions.			INSMET
Slow implementation and delays in procurement, installation and capacity building activities	• Operational	High	Possible	Major	UNDP has extensive experience in procurement processes to strengthen meteorological surveillance in the country. The technical description of the equipment is available, and a strategy has been designed to carry out part of the equipment procurement processes through direct purchases from suppliers approved by INSMET. The inclusion of construction materials and fuel needs in INSMET's economic plans has been planned to ensure the equipment installation processes. INSMET has trained personnel to install most of the equipment acquired by the Project and has identified national institutions responsible for installing the remaining equipment. However, a set of training sessions for the use, installation, and maintenance of the new technology to be acquired has been planned. UNDP will also work with INSEMET in the preparation of time bound procurement plans to ensure that time management is well considered.			UNDP y INSMET

After the conclusion of the Investment phase, GBON data are not collected or shared or are shared of insufficient quality	• Strategic	Low	Unlikely	Insignificant	It is planned to acquire technology that is compatible with GBON requirements, which has been used before in the country. The technical specifications of the technology will ensure the possibility of installing new measurement systems according to their operating principle to guarantee the compatibility of the acquired technology with the existing one. During the procurement process, once the technical offers are received, INSMET technical staff will review them to guarantee the specifications are right. It has been considered to include hardware and software updates of the equipment in the procurement processes.	INSMET, AEMET
Destruction or theft of SOFF-financed equipment and infrastructure	• Organizational • Operational	Low	Unlikely	Insignificant	The stations to be improved are located in facilities with INSMET personnel at the local level, except for the new station, for which security conditions have also been considered. INSMET will ensure that the stations are installed to withstand extreme weather per national and international standards.	INSMET
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	High	Possible	Moderate	Cuba has restrictions due to the blockade on some internet sites. However, you can always access one of the Global Data Processing Centers, such as those commonly used in China, Europe, among others.	INSMET

Budget by UNSDG Categories: Over all

Budget Lines	Description	UNDP (7%) *	WMO (7%) *	Total
1. Staff and other personnel		\$344,914.00	\$0.00	\$344,914.00
2. Supplies, Commodities, Materials		\$2,181,050.00	\$0.00	\$2,181,050.00
3. Equipment, Vehicles, and Furniture, incl. Depreciation		\$1,849,295.00	\$0.00	\$1,849,295.00
4. Contractual services		\$500,450.00	\$398,859.93	\$899,309.93
5. Travel		\$343,000.00	\$0.00	\$343,000.00
6. Transfers and Grants to Counterparts		\$0.00	\$0.00	\$0.00
7. General Operating and other Direct Costs		\$479,290.00	\$0.00	\$479,290.00
Project Costs Sub Total		\$5,697,999.00	\$398,859.93	\$6,096,858.93
8. Indirect Support Costs		\$398,859.93	\$27,920.20	\$426,780.13
Total		\$6,096,858.93	\$426,780.13	\$6,523,639.06

Performance-based Tranches Breakdown

Tranche				Total
Tranche 1	UNDP (0%)		\$0.00	\$0.00
	UNDP (0%)		\$0.00	

Tranche			Total
Tranche 2	UNDP (80%)	\$4,877,487.14	\$5,019,732.96
	WMO (33.33%)	\$142,245.82	
Tranche 3	UNDP (20%)	\$1,219,371.79	\$1,361,617.60
	WMO (33.33%)	\$142,245.82	
Tranche 4	UNDP (0%)	\$0.00	\$142,288.50
	WMO (33.34%)	\$142,288.50	
			\$6,523,639.06

Results based budget

Outcome *	Output *	Agency *	Budget (USD) *
1. GBON institutional and human capacity developed		Sub Total	\$922,471.26
	1.1 National Consultations conducted	UNDP (7%)	\$15,000.00
	1.2 NMHS institutional capacity developed	UNDP (7%)	\$199,781.33
	1.3 NMHS human capacity developed	UNDP (7%)	\$308,830.00
	1.3 NMHS human capacity developed	WMO (7%)	\$398,859.93
2. GBON infrastructure in place		Sub Total	\$2,444,166.33
	2.1 New land- based stations in place	UNDP (7%)	\$377,345.00
	2.2 Improved land-based stations in place.	UNDP (7%)	\$965,321.33
	2.3 New upper-air stations in place.	UNDP (7%)	\$1,101,500.00
3. Sustained compliance with GBON		Sub Total	\$2,730,221.33
	3.1 GBON land-based stations' commissioning period completed.	UNDP (7%)	\$1,010,221.33
	3.2 GBON upper air stations' commissioning period completed.	UNDP (7%)	\$1,720,000.00
Total			\$6,096,858.92

Programme Outcome Costs

Outcome	Output	Activity	Implementing Agent	Time Frame				
				2026	2027	2028	2029	2030
				1	1	1	1	1
1. GBON institutional and human capacity developed								
	1.1 National Consultations conducted		Conduct national workshops with consulting activities with civil society organizations and stakeholders.					
			UNDP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
			WMO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.2 NMHS institutional capacity developed		Develop an instruction manual that should be in line with the standard operating procedures (SOPs)					
			UNDP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
			WMO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Outcome	Output	Activity	Implementing Agent	Time Frame				
				2026	2027	2028	2029	2030
				1	1	1	1	1
		Develop capacities for the institution's senior management staff, as described in Table 44 of the National Contribution Plan.						
			UNDP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WMO	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		1.3 NMHS human capacity developed						
		Develop capabilities for the institution's technical personnel to correctly operate surface and radiosonde stations, as described in Table 44 of the National Contribution Plan.						
			UNDP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
			WMO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Conduct national workshops for continuous training of the institution's human resources.						
			UNDP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
			WMO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		2. GBON infrastructure in place						
		2.1 New land- based stations in place						
		Procurement of materials and equipment for the new station.						
			UNDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Identification, evaluation and preparation of the new station.						
			UNDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WMO	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Preparation of the equipment for installation in the new station.						
			UNDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WMO	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Installation of the new station and other activities necessary for the completion of the observation system in the new station.						
			UNDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WMO	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Update of the infrastructure and power sources of the INSMET ICT as well as its telecommunications and data management services.						
			UNDP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WMO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		2.2 Improved land-based stations in place.						
		Procurement of materials and equipment for the 8 rehabilitated stations						
			UNDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Identification, evaluation and preparation of the 8 rehabilitated stations.						
			UNDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WMO	<input type="checkbox"/>				
		Installation of the equipment in the 8 rehabilitated stations including all the relevant necessary activities for the incorporation of the rehabilitated stations into the observing system						
			UNDP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WMO	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		2.3 New upper-air stations in place.						
		Procurement of materials and equipment for the new station.						
			UNDP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Identification, evaluation and preparation of the new station.						
			UNDP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WMO	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Preparation of equipment for installation at the new station.						
			UNDP	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WMO	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Installation of the equipment and related activities necessary for the completion of the observing system at the new station						

Outcome	Output	Activity	Implementing Agent	Time Frame				
				2026	2027	2028	2029	2030
			UNDP	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WMO	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Sustained compliance with GBON								
	3.1 GBON land-based stations' commissioning period completed.							
	Enhance the capacity of the calibration laboratory to allow it to perform calibration to the GBON equipment.							
			UNDP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WMO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Strengthen the National Maintenance Technical Center and create a second Maintenance Support Technical Center							
			UNDP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WMO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Acquisition of materials and tools for maintenance and calibration							
			UNDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WMO	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Activities to perform calibration and maintenance							
			UNDP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			WMO	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	3.2 GBON upper air stations' commissioning period completed.							
	Maintenance operational actions for UA station (costs associated to OM)							
			UNDP	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			WMO	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Acquire spares and consumables							
			UNDP	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Signatures

Annex: Terms of Reference for the provision of technical advisory services during the SOFF Investment Phase

1. Purpose and scope

These Terms of Reference describe the provision of technical advisory services by the AEMET to the Cuba to contribute to the delivery of the SOFF Investment Phase outputs as described in Section 3.

The Terms of Reference are based on the SOFF Operational Manual, Section 4.4.3 on the Operational Partners and Section 4.5.2 on the Investment Phase; as well as on the SOFF Investment Framework, Section 4.5 on the Peer Advisors and WMO Technical Authority.

2. Roles and responsibilities

Beneficiary country National Meteorological and Hydrological Service

- Is responsible for implementing the activities of the SOFF Investment Phase activities with the support of the Implementing Entity and the peer advisor.
- Submits the SOFF Investment Phase funding request using the standardized template provided by the SOFF Secretariat, including the Terms of References for the peer advisor's technical advisory services during the Investment Phase.
- Is responsible for collaborating with the Implementing Entity to provide all the necessary information, participate in and facilitate the national activities that the Implementing Entity and peer advisor need to conduct in order to deliver the SOFF Investment Phase outputs.
- Confirms the completion of all the Investment Phase activities and provides comments as needed on the final report prepared by the Implementing Entity.

Peer advisor

- Is accountable to the beneficiary country and the Implementing Entity.
- Is contracted via the WMO pass-through mechanism and operates on a cost-recovery basis.
- Provides technical advisory services to support beneficiary countries and Implementing Entities in the design and implementation of the SOFF Investment Phase activities.
- Contributes to the final report of the SOFF Investment Phase.

Implementing Entity

- Prepares the Investment Phase funding request in collaboration with the beneficiary country and the peer advisor, including the Terms of References for the provision of technical advisory services during the SOFF Investment Phase.
- Manages the Investment Phase activities following the terms specified in the funding request and in collaboration with relevant national partners, including civil society organizations.

- Delivers the Investment phase outputs and is responsible for their quality and timely delivery, in coordination with the country and the peer advisor.
- Provides quarterly updates to the SOFF Secretariat according to a simple standardized form and annual reports according to the United Nations Multi-Partner Trust Fund Office's reporting requirements indicated in the legal agreements.
- Informs the SOFF Secretariat of circumstances that could materially impede the implementation of the Investment phase or any considerable deviation in the conditions of the funding request to achieve its objectives.
- Submits the final report to the SOFF Secretariat including the beneficiary country's comments and the peer advisors' feedback. The final report describes the institutional arrangements to secure sustained operation and maintenance of the investments made.

WMO Technical Authority

- Provides basic on-demand technical assistance to the beneficiary country, Implementing Entity and peer advisor on GBON regulations, including on monitoring and assessing the data-sharing status of the stations using the WDQMS web tool¹
- Is responsible for the verification of data sharing of the new or rehabilitated surface and upper -air stations as per GBON regulations.
- WMO provides a verification report to the SOFF Secretariat, upon which the Investment Phase can be considered completed.
- Establishes and administers the pass-through mechanism for contracting and funding of the advisory services provided by the peer advisors.

SOFF Secretariat

- Facilitates communication, coordination and collaboration between the beneficiary country, the Implementing Entity, the peer advisor and WMO Technical Authority.
- Reviews the SOFF Investment Phase funding request, including the Terms of Reference for the provision of technical advisory services and provides feedback as needed. Then transmits the funding request to the SOFF Steering Committee for their decision.
- Compiles quarterly updates and annual reports and monitors implementation based on information received from the Implementing entity, the peer advisor and the beneficiary country. Regularly informs the Steering Committee of progress.
- Coordinates regional implementation approaches to the SOFF Investment Phase.
- Confirms receipt of the final report by the Implementing Entity and completion of the Investment Phase based on WMO verification of data sharing.
- Organizes exchange of knowledge and experiences and captures lessons learned.

¹ The WDQMS web tool monitors the availability and quality of observational data based on near -real-time information from the four participating global Numerical Weather Prediction centres: the German Weather Service (DWD), the European Centre for Medium range Weather Forecasts (ECMWF), the Japan Meteorological Agency (JMA) and the United States National Centers for Environmental Prediction (NCEP). These are four of the ten World Meteorological Centres, designated by WMO to provide global numerical weather prediction products for all WMO Members.

3. Peer advisors' activities during the SOFF Investment Phase

The peer advisor will contribute to the delivery of the SOFF Investment Phase outputs as described in the *RBM* section of the SOFF UNMPTF Gateway through the following activities:

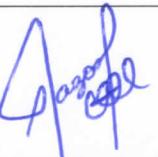
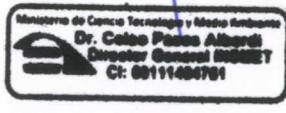
Output	Indicator (Please copy the indicators from RBM section of the Investment Funding request.)	Activities conducted / contributions (Please list all activities that will be conducted by the peer advisor relevant to the output. Please add rows if more than one activity will be conducted.)	Implementation plan				
			Y1	Y2	Y3	Y4	Y5
1.1 National consultations , including with CSOs and other relevant stakeholders conducted	Number of national workshops with consultancy activities involving civil society organizations and stakeholders.	Assistance in the preparation and organization of workshops, including design, promotion and logistic.	X			X	
	Percentage of participant women	Support to implement Gender Balance model and define monitoring assessment	X	X			X
1.2 NMHS institutional capacity required to operate the GBON network developed	Number of high-level executives trained.	<ul style="list-style-type: none"> - Assistance for creating capacity buildings and enhancing skills to operate AWS and radiosounding. - Support preparing a roadmap for a competence-building process that fits Cuba's Context. 	X	X	X		
	Percentage of participant women	<ul style="list-style-type: none"> - Support identifying and compare best practices 	X	X			
	Percentage of the instruction manual completion.	<ul style="list-style-type: none"> - Support drafting and improving Standard Operating Procedures 	X	X	X	X	

		<ul style="list-style-type: none"> - Support in preparing a roadmap for implementing QC/QA methods 	X	X	X	X	
1.3 NMHS human capacity required to operate the GBON network developed	Number of technical personnel trained.	<ul style="list-style-type: none"> - Training on technical aspects, for example, observations, data management, data exchange and WDQMS - Training on AWS and radiosounding lifecycle maintenance and calibration 	X	X	X	X	
	# of training and workshops developed	<ul style="list-style-type: none"> - Training on technical aspects, for example, observations, data management, data exchange and WDQMS - Training on AWS and radiosounding lifecycle maintenance and calibration 	x	x	x	x	
2.1 New land-based stations and related equipment, ICT systems, data management systems and standard operating practices in place	# of new stations installed as per the GBON National Contribution Plan	<ul style="list-style-type: none"> - Assistance with technical aspects of AWS bidding procedure - Assistance with technical aspects of IT bidding procedure 	X	X	X		
2.2 Improved land-based stations and related equipment, ICT systems, data management systems	# of stations improved as per the GBON National Contribution Plan	<ul style="list-style-type: none"> - Assistance with technical aspects of AWS bidding procedure - Assistance with technical aspects of IT bidding procedure 	X	X			

and standard operating practices in place						
2.3 New upper air stations and related equipment, ICT systems, data management systems and standard operating practices in place	# of new stations installed as per the GBON National Contribution Plan	<ul style="list-style-type: none"> - Assistance with technical aspects of radiosounding bidding procedure - Assistance with technical aspects of IT bidding procedure - Assistance with technical aspects of operational use of system 	X	X		
2.4 Improved upper air stations and related equipment, ICT systems, data management systems and standard operating practices in place	# of stations improved as per the GBON National Contribution Plan	N/A	X	X		
3.1 GBON land-based stations' commissioning period completed , country-specific standard cost for operations and maintenance established, and data sharing verified by WMO Technical Authority	# of stations commissioned as per the GBON National Contribution Plan	<ul style="list-style-type: none"> - Support drafting and improving Standard Operating Procedures - Guidance on radiosounding and AWS data transmission and handling - Advice on implementing a data management system. - Contribution to final reporting 	X	X	X	X

3.2 GBON upper air stations' commissioning period completed , country-specific standard cost for operations and maintenance established, and data sharing verified by WMO Technical Authority	# of stations commissioned as per the GBON National Contribution Plan	<ul style="list-style-type: none"> - Support drafting and improving Standard Operating Procedures - Guidance on radiosounding and AWS data transmission and handling - Advice on implementing a data management system. - Contribution to final reporting 	X	X	X	X
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Signatures

Peer advisor focal point	<p>Name: Fernando Belda Esplugues Title: Senior Adviser and Spanish SOFF Focal Point Institution: AEMET (Agencia Estatal de Meteorología). Spain</p> <p>Date FERNANDO BELDA ESPLUGUES</p>	<p>Firmado digitalmente por FERNANDO BELDA ESPLUGUES Fecha: 2026.01.05 19:54:21 +01'00'</p>
Country focal point	<p>Name: Celso Pazos Alberdi Title: General Director Institution: Institute of Meteorology of Cuba</p> <p>Date <i>05/01/2026</i></p>	  <p>Ministerio de Ciencia, Tecnología y Medio Ambiente Dr. Celso Pazos Alberdi Director General AEMET C: 69111400791</p>