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GBON National Contribution Plan of *Djibouti*

Systematic Observations
Financing Facility

**Weather
and climate
data for
resilience**



GBON National Contribution Plan

[Djibouti]

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Module 1. National Target toward GBON Compliance

Djibouti, located in the northeast of the horn of Africa, covers 23,200 km² and has 370 km of coastline and a population of 1.1 million inhabitants. Except for the urban centre of Djibouti City (about 766,966 inhabitants), the population density is low. The landscape of Djibouti is variable and extreme, ranging from low-lying areas along the coast to a series of low desert plains separated by parallel plateaus in the west and south and rugged mountains in the north with highest peak is Mount Moussa at 2,028 m.

The national target for Djibouti toward GBON compliance, based on the WMO Global assessment (June 2023), calls for one (1) surface station for standard resolution (200 km). In terms of an upper air site, the GBON requirement calls for a single (1) upper-air station. This requirement is shown in the Table 1 below:

Table 1. GBON National Contribution Target (200 km radius for surface stations and 500km radius for upper air station)

Type of station	WMO GBON Global Gap Analysis, June 2023				GBON National Contribution Target	
	Target	Reporting	Gap		To improve	New
			To improve	New		
	[# of stations]				[# of stations]	
Surface	1	0	1	0	1	0
Upper air	1	0	1	0	1	0
Marine	*When applicable					

1.1 Surface stations

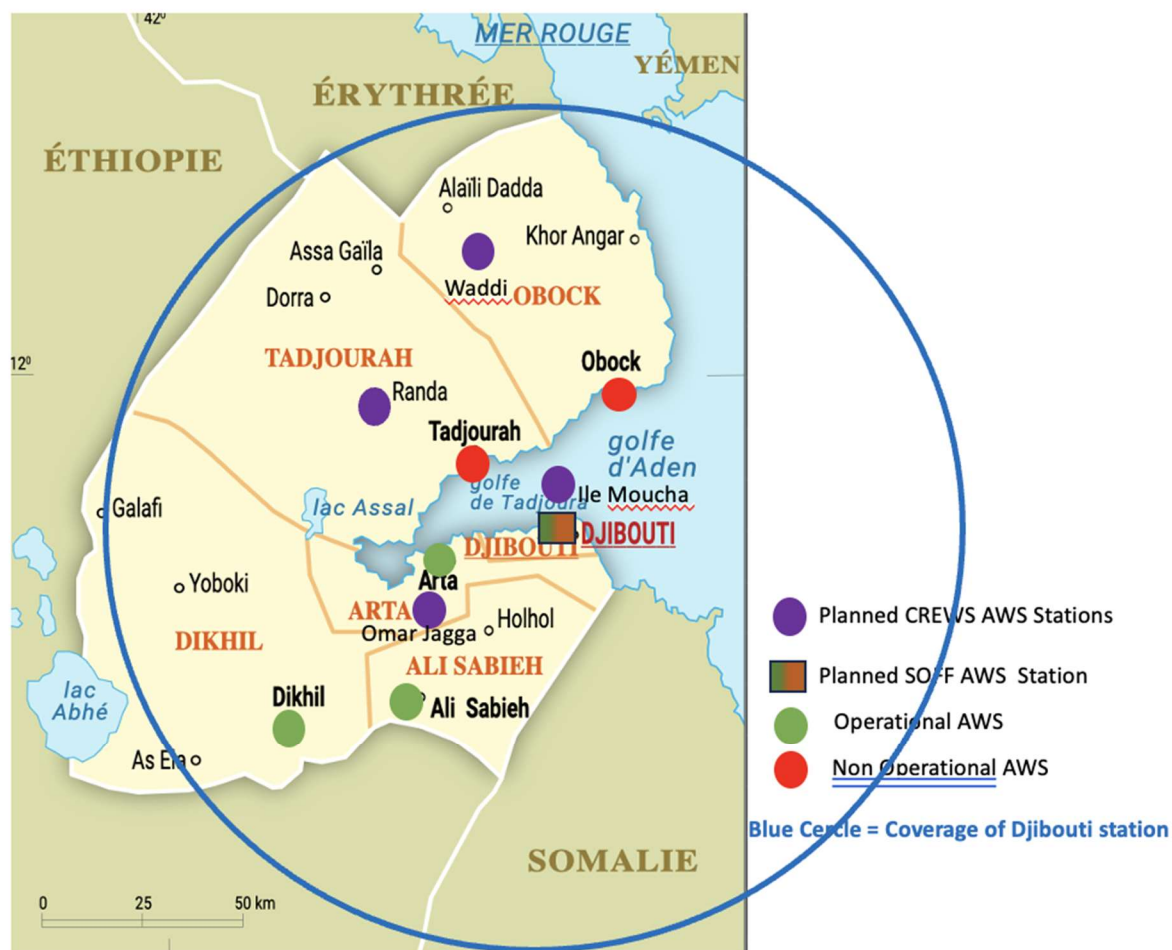
Djibouti has currently four (4) Automatic Weather Stations (AWSs) which are operational but do not transmit their data internationally. They are located at the following locations: Djibouti City, Arta, Dikhil, and Ali Sabieh, all of which are located in the southern part of Djibouti (the Plaine area). There are two other non-functional stations. One at Obock, destroyed by strong winds and the second at Tadjoura, severely vandalized. The approved CREWS project (WMO), already initiated, plans to install 4 more AWSs in Waddi, in the North East, in Moucha Islands in the Gulf of Tadjourah, in Omar Jagga, in the south of Arta city and in Randa, a town in the Central North West, in a higher altitude (842m above sea level (asl)). Discussions with Officials of the Agence Nationale de Météorologie (ANM) resulted in the recommendation that under SOFF umbrella, the existing station at Djibouti International Airport (Djibouti City) should be rehabilitated considering its location in the major city of Djibouti, the highest concentration of Djibouti (73%). However, in order to create a harmonious network (and thus making its maintenance much easier), it is recommended to replace the current AWS at the airport with a new AWS identical to these, deployed via the UNDP/CREWS project. Table 2 and Figure 1 below show the abovementioned different (current and future) stations, together with their coordinates and status.

Table 2: Current and planned AWSs in Djibouti

Current and planned surface network in Djibouti				
Number	Station location	Lat	Lon	Status and Action
1	Djibouti	11° 49' 21" N	42° 35' 18" E	Recommended for rehabilitation by SOFF
2	Arta	11° 31' 25" N	42° 50' 50" E	Operational but not GBON compliant – No action from SOFF
3	Ali Sabieh	11° 9' 0" N	42° 43' 0" E	
4	Dikhil	11° 7' 0" N	42° 22' 0" E	
5	Omar Jagga	11° 22' 33" N	42° 45' 25" E	Planned installation by CREWS. No action from SOFF
6	Moucha Island	11° 43' 0" N	43° 11' 0" E	
7	Waddi	12° 21' 16" N	42° 55' 35" E	
8	Randa	11° 50' 50" N	42° 39' 47" E	
9	Obock	11° 58' 0" N	43° 17' 0" E	Totally destroyed stations. No Actions from SOFF
10	Tadjoura	11° 47' 00" N,	42° 53' 00" E	

The Figure 1 below shows the AWSs that are operational but not transmitting their data internationally, the AWSs that are planned by the CREWS project (4 AWSs) and the one required under the SOFF project to be improved in Djibouti City.

Figure 1. Map of existing and proposed surface stations. A circle of 100 km of radius (Blue line) around Djibouti City is shown. (A 200km radius circle will be way out of the map)



1.2 Upper air station

According to the GBON requirements for upper air stations, Djibouti should operate a single station. It is highly recommended that the location should be at the ANM HQ in the Djibouti Airport compound (Figure 2). Thus, both GBON surface and upper-air stations would be roughly at the same location, which facilitates maintenance and accessibility. An old upper site exists, but it will need to be completely rebuilt as only old unsecured walls remain.

Figure 2a+b. Maps showing the location of the potential SOFF Upper air Station.



The upper air site to be rebuilt, is located at the Djibouti Airport. It will provide upper-air data coverage beneficial for a regional area, including neighboring countries, due to the absence of similar facilities around. An upper air station, with a radius of 500 km, covering, therefore, the whole of Djibouti, a good part of Somalia, Eritrea, Ethiopia and Yemen.

It should be emphasized here, that currently Eritrea, Somalia or Yemen is not operating any upper air stations (or seem to be able to operate such in the near future). Thus, such a station could serve the needs of these countries as well. In addition, it completes the picture of the main Ethiopian Upper Air Station, located in Addis Abeba, also as a back-up. It should be added that the nearest existing upper air stations are located much further away – in Egypt, Kenya and Saudi Arabia. Currently, the entire region of the horn of Africa is represented by a single upper air station (the one in Addis Abeba), which is going to be rehabilitated as well through SOFF.

1.3 Marine stations

Although marine observations are currently not part of SOFF, consideration should be given to installing, through other projects, a buoy in the Bab-el-Mandeb strait to assist with the marine program supporting maritime transportation.

Following the analyzed gap and the planned investment phase (to be further elaborated in module 3), it is expected that the single surface station would be improved during the first year, and a new upper air station to be deployed, tested and operationalized during the second and third years of the suggested plan. **Hence, Djibouti should become surface complaint after one year and upper-air complaint at the end of the third year.**

Module 2. GBON Business Model and Institutional Development

2.1. Assessment of national governmental and private organizations of relevance for the operation and maintenance of GBON

In Djibouti, Meteorological services are provided by the Agence Nationale de Météorologie (ANM), a semi-autonomous organization (legally established as an independent Agency but still receiving funding from the Government). The Law, No. 108/AN/10/6ème L (See Appendix I), reorganizing the Ministry of Equipment and Transport and establishing its responsibilities, put ANM under the responsibility of the Ministry of Equipment and Transport. The Decree No. 2012-167/PR/MET specifies the mission and organization of the National Meteorological Agency of Djibouti (See Appendix II). The decree is very extensive and covers most of the fields of activity, regarded as standard in the current understanding of the function of a modern NMHS. Through a Ministerial, circular, ANM is authorized to sell its data although this is not acted on. However, under GBON/SOFF rules, data from GBON stations should be shared free of charge with international communities, which is supported by resolution 1 of WMO congress (CG- Ext 2021). In addition, the existing budget is limited to ensure proper maintenance of observation stations.

Hydrology is under the responsibility of the “Centre d’Etudes et de Recherches de Djibouti” (CERD) which receives from ANM meteorological data for its operations. Data is transferred from ANM to CERD through email when requested, mainly for CERD research. Hydrological data are not directly accessible to ANM. It is planned through the CREWS (Climate Risk Early Warning Services) Project that a compatible data management system for ANM and CERD will be established to address this issue. It might also be a possibility to develop an API to share the data between both institutions.

ANM government partnerships for service delivery include partnerships, through MoUs, with the Civil Protection Agency, CERD, the Secretariat for Disaster Risk Management at the Ministry of Interior, and with the Ministry of Agriculture. There is no private sector providing operational observations and data services in Djibouti. Some of the foreign military bases in Djibouti may have their own stations but their data is not shared with the ANM.

Recommendations

- 1) The government should allocate additional resources (Human Resources and Financial) to ensure proper/regular maintenance of stations (and ANM as a whole).
- 2) Creation of a compatible data management system where all Hydromet data from ANM and CERD can be managed (will be initiated via CREWS)
- 3) Explore the possibility of accessing observation data from the foreign military bases (can serve as an excellent back up for the government observing systems), through MoUs with the relevant defense ministries of these countries, through the Ministry of Foreign Affairs of Djibouti.
- 4) Investigate potential revenue generation through understanding users’ needs and development of decision-support systems to help with the maintenance costs of stations.

2.2. Assessment of potential GBON sub-regional collaboration

The republic of Djibouti is surrounded to the South by Somalia; to the North by Eritrea and to the West by Ethiopia. With the official launch of SOFF investment funding (Dec 2024) for Ethiopia which will see the upgrade of 15 existing surface weather stations and the installation of 13 new ones and of 5 upper air stations to meet GBON requirement, there is a great opportunity of sub-regional collaboration for data exchange. Somalia has submitted for SOFF readiness funding and will eventually, if approved, contribute to the sub-regional network with 16 surface and 3 upper air stations. Sub-regional collaboration will also extend to the Intergovernmental Authority on Development (IGAD) Climate Prediction and Applications Centre (ICPAC), thus ensuring a capacity to produce accurate and timely forecasts for the region. Though, a language barrier might be an issue between Djibouti and Ethiopia, but less between Djibouti and Somalia, as both countries use Arabic as their second official language. Establishing cooperative arrangements with existing foreign military observation networks in Djibouti (such as the ones operated by France, Italy, Japan ,etc.) — would provide a strategic and reliable supplementary source of meteorological data, thereby strengthening the nation's observational capacity, data continuity, and resilience in meteorological operations.

2.3. Assessment of a business model to operate and maintain the network

As described in section 2.1 above, ANM is responsible for the provision of meteorological services, including weather forecasts and warnings, in Djibouti. It is an Agency, which should be self-funded, but currently, its budget from the government and the High Authority of Civil Aviation (AAC) and the Directorate of Djibouti International Airport (AID) covers mainly the salary costs only. The lack of qualified personnel, operational infrastructure and capacities currently constitutes, still, a major obstacle for ANM to adequately maintain its stations. See the Country Hydromet Diagnostic ([CHD](#)) for more details.

Recommendations

- 1) The government should assume full control of the observational capacities/operation and services – therefore a public model is proposed, which is suitable given the limited role of the private sector operators in the country. This model should be set up in a way that it does not prevent any private sector entity or foreign military base from providing support to reinforce ANM's capabilities.
- 2) Ensure, through the government's support, that ANM is responsible for the operations, maintenance, and replacement of the equipment, considering its life cycle and subsequent replacement. This could be achieved by ensuring that ANM Core operational functions needs are included in specific budget lines within the national financial law. Financial requirements to ensure sustainability of operations of the stations will be discussed in detail in the investment plan being prepared by UNDP, the implementing entity. Recommendations for aligning the ANM budget with SOFF support during the compliance phase, considering the revised operating costs of the modernized infrastructure, will be integrated into the funding proposal. In addition, through political lobbying, stakeholder's workshops and continuous dialogue between ANM, UNDP, GeoSphere Austria and the Djibouti government, strengthen the position and visibility of ANM in the general governmental system. In such a case, the government might support a cost-recovery model with the Aviation and Marine Sectors. Due to the associated institutional and operational risks, the model will require close supervision and technical support during both the investment and compliance phases to ensure effective implementation, accountability, and sustainability.

- 3) As already abovementioned (in 2.1), explore new opportunities for potential additional revenues (through developing services and products for different stakeholders, governmental, private and even foreign – the ones who maintain a military and civil presence in Djibouti). The additional revenues could add to the necessary budget, necessary, first, for the additional staff as well as transportation costs, and later on also for consumables and spare parts.
- 4) In collaboration with CREWS, adopt the future budget planning; through the future strategic plan of ANM, to the requirements so that they will include sufficient manpower, at least, which is required for the proper maintainance and operation of the GBON network. If recommendations 2 and 3 will bring an increase of the budget, also including the consumables and the spare parts into the ANM's budget.

The suggested business model has the following Risks:

Risk	Impact	Likelihood
Financial risk – changing funding based on political governance changes, leading to limited or discontinued budget and resources	High	Low considering the Government of Djibouti is relatively politically stable (145 global rank out of 193 countries) – but due to increased regional geopolitical instability, it might lead to decreased revenues from air and maritime transportation Efforts should be made to generate revenue for special services in order to significantly reduce financial risk from the Govt funding
Sustainability challenges – low flexibility on adapting to changing circumstances or if political forces drive into other directions	High	Low – see above
Market competition – potential competition with the private sector and leading to distorted markets	No impact due to non-existence of competing private sector	Low – since there is no private sector operating weather information in the region.
Quality of the services – due to limited resources	High	Medium to high due to lack of Human/Financial resources and infrastructure – instauration of capacity development program combined with a solid

		revenue generation program can help reduce the risk
Management competence – due to lack of personnel or corresponding training to manage a larger and more complex service	High	Medium - currently significant lack of qualified personnel – Lobbying government for new staff hiring and training program would help reduce that risk
Limited legal frameworks and data policies in place that limit the exploitation of the new capacities	Medium – there is already a government decree in place to sale data which needs updating	Low
Data gaps usually due to “operate to fail” approach triggered by constrained resources	Medium	Medium – no assurance of sustained funding from the government to ensure continuous maintenance of the stations - Risk can be reduced with an establishment of revenue generation program
Ineffective monitoring and tracking of the network and its related purchases, etc.	Medium	Medium to high – limited personnel to be trained to monitor and track the network
Logistics	Low	Low – both SOFF stations (the surface and upper-air stations are to be located at the international airport, which is also the seat of the HQ of ANM
Ineffective monitoring and tracking of the network and its related purchases etc.	Medium	Low – together with CREWS, a reliable data management system to be installed, with related training. The related purchases will be regulated by a steering committee, which will include ANM, UNDP and GeoSphere Austria.

2.4. Assessment of existing national strategies and projects related to observing networks

The ANM has a Strategic Plan (2021-2025) to guide its investments in particular, one of the strategies is to densify and improve the monitoring network. The plan will be updated under the CREWS project to cover the period until 2030.

A few projects are planning to install new AWSs in Djibouti: as already mentioned CREWS (Climate Risks and Early Warning System), the Green Climate Fund (GCF), the GEF and SOFF. The CREWS project has been already approved, and its implementation has already been initiated. It has been planned, as indicated above, to install 4 AWSs. The GCF project is still under development, without a clear date for future implementation, with the idea of installing more additional stations (number not determined yet). The GEF project plans to install six solar powered meteorological and hydrological stations. A single surface station will be rehabilitated under SOFF, as well as a single upper air station will be rehabilitated at a former upper-air station location. The project teams of the three projects (CREWS, GCF, SOFF) are already coordinating their respective efforts for the acquisition and installation of the observing stations.

The WMO implementation of WIS 2.0 is progressing well and was successfully done in one of GeoSphere Austria's SOFF countries -, in Chad - and the same approach should be considered for Djibouti. It will support international transmission of SOFF, CREWS and GCF stations data.

Recommendations

- 1) CREWS being the first to move to implementation; it is recommended that both SOFF and GCF use CREWS technical specifications for their future surface AWSs respective procurements. This would facilitate acquisition of the same type of surface station facilitating, therefore, training of personnel for the maintenance and the acquisition of spare parts.
- 2) Since CREWS will acquire their 4 (four) stations earlier than SOFF, it is recommended that an arrangement be made between WMO Regional Office for Africa, CREWS and SOFF to install "WIS2 in the Box" pending the full implementation of WIS 2.0 node by SOFF. This would ensure international transmission of the 4 stations data as soon as they are installed. Of note, WIS2.0 was successfully implemented in Chad and Burkina Faso with the help of the WMO Africa Regional Office. Collaboration with the IT Staff from these countries (gained expertise) is highly recommended. This will ensure that all operational AWSs in Djibouti transmit their data internationally to meet GBON requirement, although only one surface station is required (but naturally, it would be even better, if Djibouti would be able to transmit data from additional stations, beyond the minimum requirement).

2.5. Review of the national legislation of relevance for GBON

Through the Decree No 2012-167/PR/Met for the creation of ANM, it has the obligation to set up networks of synoptic, climatological, agrometeorological and rainfall observation stations and to keep them in working order permanently and without interruption to ensure its mission.

In terms of the parts of the legislative framework related to procurement, import, and customs processes, the ANM is normally not exempted from tariffs. However, when it receives a donation of equipment, as will be the case for SOFF, it is customary for the Minister of

Equipment and Transports to write to the Minister of Finance for a tariff waiver. Information on the equipment, types, costs and weights needs to be provided to the DG ANM, who will seek his minister's confirmation to write to the Minister of Finance with a request to lift the requirement for paying taxes and excises.

Recommendations

- 1) The main overall recommendation is to keep the upper management of ANM always in the loop during the procurement of the equipment to avoid delays. In addition, it is recommended to seek support from the Ministry of Equipment and Transports, to effectively capitalize on the role and legal mandate of ANM, and to obtain derogation for paying taxes and excises for Meteorological equipment, spare parts and any additional hardware required.
- 2) Ensure that the procurement of the SOFF single AWS surface station is made by the UNDP, the implementing entity, and through the WMO procurement contract signed under CREWS (taking note of the one-year limit set under the contract to copy the results of the procurement process). This would facilitate procurement of the same type of surface stations and spare parts through a single procurement contract.
- 3) For the upper-air station at the time of procurement or purchasing of the station (including spare parts and all related infrastructures), taxes and potential customs fees should be properly accounted for even if it will, eventually, be waived by the Minister of Finance.
- 4) Strengthen the institutional mandate to ensure a sustainable approach to network maintenance and operation as well as the general well-being of ANM itself. If possible, this legal framework should not only describe the mandate but also the underlying aspects that would support and maintain the mandate. Proper communication and infrastructure facilities, observation networks, databases, and data exchange policies need to be put in place. While steering the political agenda is beyond the capacities or intentions of the activities within SOFF, advocacy towards the establishment of this legal framework will be performed and supported in all instances possible.

Module 3. GBON Infrastructure Development

3.1. Design the surface and upper air observing network and observational practices

As described in the National Gap Analysis (NGA), the GBON compliance requirements for Djibouti include data from a single (1) surface and a single (1) upper air station as shown in Fig 1 and 2 above. The implementation of these stations must consider the following:

- **Security** – As already mentioned (the severe damage to the AWS at Tadjourah), vandalism is a major issue and hence, it is highly recommended that the SOFF station will be surrounded by a robust metal fence, resistant to vandalism, with local surveillance if possible.
- **Maintenance of stations** – Difficult physical access to stations outside the city (poor road conditions, particularly during the rainy season where sections of roads are regularly washed out by torrents rushing down the mountains and lack of maintenance vehicles); lack of human resources, as well as lack of technical capacity are all limiting factors that need to be considered early on.
- **In terms of international data sharing**, the implementation of WIS 2.0, as soon as possible, would quickly bring Djibouti to GBON Compliance. As indicated above, it is strongly suggested to work with Chad and Burkina Faso Met services and the WMO Regional Office for Africa (with potential support from the RIC in Casablanca) to facilitate the implementation of WIS 2.0.

To facilitate maintenance of the proposed GBON surface station, it is highly recommended to acquire a station identical to the stations that will be procured by the CREWS Project, since it would be the first project to be implemented. This would facilitate training and acquisition of spare parts as well as the use of a common software platform for the collection and transmission of data. CREWS is planning to by MSH software for CERD and enable ANM to continue using Climsoft. This approach will facilitate the acquisition and maintenance of all surface GBON stations.

For the upper air system, it is recommended to acquire the same upper air station as to the ones used and procured by ASECNA (Agence pour la SECurity de la Navigation Aérienne and Afrique et Madagascar) to facilitate its acquisition, training of personnel and purchasing of consumables and spare parts as recommended in other francophones countries in Africa. This approach would lift the language barrier and would facilitate training and know-how and experience exchange.

Annex II provides the Decree for the creation of ANAM; Annex III provides the specifications of potential surface stations, and Annex IV lists the required equipment and consumables for the upper air sites. Note that the upper air site will need a full rehabilitation of the infrastructure.

It is recommended to proceed in two phases:

Phase 1: Year 1: Surface station rehabilitation in Djibouti city

- Rehabilitate the station at the Djibouti city airport (procure a new AWS)
- Continue operation of the surface manual station, for reference. The new AWS will be designed as a GBON station, only after at least six months of parallel operation with the manual station.
- Train the local staff, with the support of the RWCs in Addis Abeba and Casablanca in metadata, data quality monitoring system performance as well as OSCAR.

- Prepare the rehabilitation (renovation) of the upper air site to house the hydrogen generator and the launch pad
- Currently, the observations combine manual readings and data from automatic stations. The data are first recorded in a notebook, then entered into an Excel file, transmitted by email to relay centers (South Africa, Ethiopia) for international distribution, due to the lack of a GTS connection. This data is then manually integrated into Climsoft, before the notebooks are digitized. It is foreseen that this approach will be modernized with the implementation of WIS through SOFF ensuring metadata management and data quality monitoring will be performed. The NCP proposes to develop a preliminary maintenance plan for the new AWS and the new upper Air station, including regular field verification and calibration (in cooperation with RIC Casablanca).
- Procure a field computer and a field verification toolkit, train the local staff to operate it, with the support of RIC Casablanca and the vendor. The toolkit should be sent once a year for a calibration. Due to the limited capacities of the RICs, calibration services for the toolkit will be acquired from the vendor on an annual basis. In case one of RICs will be already able to calibrate, the calibration will be transferred to the RIC (preferably to the future one in Addis Abeba, due to its proximity and the fact that both cities are well connected by air and land).

Phase 2: Year 2-3: Upper air station implementation in Djibouti City

- Proceed with rebuilding the Upper air site (building construction)
- Proceed with the procurement and installation of equipment (Hydrogen Generator and accessories) and the procurement of consumables and spare parts (Recommended hydrogen generator is the SAGIM MP 500 planned for Chad and used by ASECNA – “Agence pour la Sécurité de la Navigation Aérienne en Afrique et Madagascar” -)
- Ensure with the vendors that related ICT and data management process and quality control, and assurance mechanisms are in place
- Hire and train relevant personnel to do small repairs such as fuse replacement and assist with diagnosing problems
- Continue with operation of the manual surface station, at least for yet another year. The manual station could provide a backup for the AWS, in cases of temporary failures.
- The phases are considered to take an overall time of 3 years and should advance the country towards full GBON compliance for both surface and upper air stations.

General maintenance plan

- Due to location of the single surface station (at the international airport of Djibouti and in proximity to ANM's offices), the station would be physically monitored by ANM's staff on a weekly basis. During the investment phase, they will conduct a field verification on a six-months base (also for training purposes). In case, the operation would become smoother, the verification would be performed on an annual case. In any case, the verification toolkit will be sent on an annual basis for calibration.
- The upper air station would be also located at the same time and hence will enjoy a continuous maintenance by ANM's staff.

3.2. Design of the ICT infrastructure and services

The Information and Communication technology (ICT) infrastructure for a meteorological network is crucial for its operation and, more importantly, within the SOFF scope, for data transmission and dissemination in real-time. The infrastructure has to consider very critical aspects that can largely modify the costs and should be carefully considered at the time of preparing the funding proposal. The technical specification of the equipment is presented in Annex III. Below are the key elements of an observation site:

- Data loggers, able to store data for at least 30 days and able to transmit the data automatically at least every 30 minutes to servers located at ANM.
- Transmission can be done through the mobile network (even 2G, is OK).
- Power supply: Wired supply is preferable but also solar power is OK (1 m² Solar Panel = 100W Peak) and Battery to bridge breakdowns in power supply or to store solar power for the night: 50-100 Ah
- Sensors: Temperature, Humidity, Precipitation, Wind speed and direction, pressure are the basic sensors.

Sustainability of the AWS operation requires that budget is allocated to the ICT for the lifespan of the station and for the data storage and data services systems. The SOFF station of Djibouti should be of the same brand as the ones from CREWS stations to facilitate data management (same server).

3.3. Design the data management system

The transmission of data from an observing station to the national data management system should be performed through reliable communications infrastructure. In the case of Djibouti station transmission of data can be done through a mobile network. Data from the station should be in the format that the server at ANM uses to ensure reception and inclusion in the ANM database. This database shall be located on a secure, highly redundant storage service and shall be the data backbone of the whole data management system.

This database will be linked to the WMO Information System 2.0 (WIS 2.0) to ensure international sharing of data as per the GBON requirement. This process has been demonstrated by Agence Nationale de la Météorologie (ANAM) in Chad with assistance from the WMO Regional Office for Africa and it is strongly recommended to consult them for WIS 2.0 implementation.

ANM is currently using Climsoft and CREWS will assist in installing a new Server. For the funding request, the implementing entity UNDP will thoroughly cross-check as CREWS will deliver to ANM.

Currently, the observations combine manual readings and data from automatic stations. The data are first recorded in a notebook, then entered into an Excel file, transmitted by email to relay centers (South Africa, Ethiopia) for international distribution, due to the lack of a GTS connection. This data is then manually integrated into Climsoft, before the notebooks are digitized. It is foreseen that this approach will be modernized with the implementation of WIS through SOFF ensuring metadata management and data quality monitoring will be performed.

3.4. Environmental and sustainability considerations

Environmental considerations will be included in the procurement process, as a selection criterion for suppliers. This will enable UNDP and ANM to consider opportunities for reusable instruments or biodegradable materials for strings, balloons and parachutes for radiosondes, sustainable packing for the new equipment, ensuring lack of mercury in the instruments, and careful use of batteries.

The intended location for both the SOFF surface and upper-air stations is already, thanks to its being at the international airport, in a secure compound. Some of the ANM staff work at the Airport, therefore basic and continuous maintenance of the surface station can easily be done. The station has a minimum impact on the environment. Spare parts and qualified technicians should be secured to ensure quick reaction/intervention to fix problems with the stations (surface and upper air) without delays. All procurement will consider environmental sustainability and detail of requirement will be handled in the investment plan being developed by UNDP. UNDP will ensure that their Social and Environmental Screening Procedure (SESP) process is applied to help identify potential risks and mitigation measures before project design is finalized. A governmental commitment in ensuring that ANM has the means to look after the stations is crucial for sustaining the contribution of Djibouti to GBON.

Module 4. GBON Human Capacity Development Module

4.1. Assessment of human capacity gaps

The staff of ANM is composed of:

- Management: 7 Engineers including the Director General, his Deputy and 3 Directors.
- Forecasting: 7 Meteorologists (Engineers)
- Technical support staff: 19 technicians
- Researchers: 7
- General support staff: 16 including secretariat staff, HR and Finance officers and a guardian.

Out of the 56 employees, 17 are female (30%). The technical staff number is relatively adequate but lacking the presence of IT experts. An updated strategic plan (2025-2030) is in the work through CREWS project and will address staff and training issues. Together with CREWS and ANM, the implementing entity and the peer advisor will construct into the new stratetifc plan, the necessary adjustments (also in terms of training the staff) to the strategic plan.

4.2. Design capacity development activities for technical staff

The establishment of a Capacity building programme for ANM is one of the pillars of the draft strategic plan 2021-2025: One of the strategies is to hire and nurture qualified Human Resources to ensure the production of quality products and services. An annual training program on the use of available information such as observed and forecast data (models' outputs) is available, but implementation is pending due to limited funding. There is also collaboration for training with ICPAC (IGAD Climate Prediction and Applications Centre) – IGAD: Inter-Governmental Authority on Development). Training of maintenance technicians will need to be programmed by SOFF). At least two IT experts should be hired to ensure observational network monitoring and ICT system operations.

Recommendations

It is recommended that the training plan should, at a minimum, include:

- 1) Weather observations and weather parameters: this training should offer the fundamentals to move towards station operations. It should provide a basic understanding of the siting criteria for observing stations, including WMO CIMO standards, and give a basic understanding of the parameters that are critical, their interrelations and basic meteorological background information with a focus on observations and guidelines, functionality and fundamental principles, maintenance of mechanic and electronic components (rules and procedures), data collection, storage (data logger) and general concepts of data transfer.
- 2) Station components and maintenance: These trainings should also be offered to those individuals located at or near the station location for easier maintenance and operations. An appropriate number of technicians (at least 2) should be assigned and

trained for the maintenance of the stations (SOFF). The operations and maintenance should also include the managerial aspects of generation of SOPs and checklists. Very important to highlight and focus on in-situ maintenance, maintenance of mechanic and electronic components

- 3) Calibration: This training should be performed in cooperation with the WMO Regional Instrument Centre in Nairobi (Kenya) and/or the WMO RIC in Casablanca (due to language barriers) and should include a visit to this center. It is particularly relevant that the role of calibration is explained and embedded into procedures downstream and all maintenance aspects that will require this knowledge. Additional training will be provided in situ by the vendor, from which the verification toolkit will be procured. Another refreshment training will be performed closer to the end of the investment phase (and then every three years).
- 4) IT, ICT and potentially HPC or cloud services: The lack of IT personnel will need to be addressed with at least two IT experts to handle all aspects related to communication, server operations (ANM operation centre) and similar services. They may also facilitate the in-house programming of simplified but effective data quality and data management procedures. This training should include Ubuntu, Linux, docker and Python at a minimum. The training should work on configuration and administration of hardware (server, networks, clients) and software (operative systems, databases, communication)
- 5) Data transfer and WIS2 specific training: This will be coordinated with ANAM Chad, the WMO Regional Office of Africa and the CREWS project to include them into the WIS2 system of Djibouti. Ideally, also the 4 AWS stations funded by CREWS will be transmitting data internationally via WIS 2.
- 6) Best practices in data quality and quality management: This should support the IT training to enable that there is a quality management system in-house that can evolve according to ANM needs. This training should offer knowledge of the value chain and its components where QM is needed, as well as the usability of benchmarking.

4.3. Design capacity development activities for senior management

Senior management development is a very important endeavor to ensure the complex processes of the weather service are managed efficiently and effectively to deliver on its mandate. It is therefore **recommended** that ANM Managers participate in various management training, such as the Executive Training Programme on Leadership and Management, offered by WMO to Managers of NMHSs. Managers should also consider getting on their own, proper training on Project management and human and financial resources management available online and at some Universities. Therefore, the capacity development of weather service managers should focus on:

- Developing leadership skills, including strategic thinking, decision-making, and communication.
- Change management, especially in the evolving nature of SOFF; it is important to gather the skills to lead and manage change within the organization and its staff members.
- Financial training and financial management, and budgeting. Managers need to familiarize themselves with financial statements, resource allocation, and the financial implications of the decisions taken.
- Project management training and Measurement and evaluation through the definition of key performance indicators to assess the effectiveness of the activities.

- Strategic planning and regional networking, especially within the UN arena to develop action plans that have cross-sectorial approaches and optimize networks to achieve strategic national objectives.
- Enhancement of the communication skills of the future spokesperson of the organization and to establish the high-level dialogues required and drive decisions towards the organization's strategies.
- Dedicated Media training
- Technology and digital literacy, leverage technologies as required.

More specifically the training should include the following components:

- An exchange to benchmark with another well-established weather service: taking advantage of the collaboration with the Peer Advisor institution, visits to WMO and GeoSphere Austria facilities to exchange best practices.
- Exchange with WMO Education and Training (ETR) to identify training activities on management. Potentially participate in Senior Management Capacity Building courses.
- Training on project management: identify a course (remote) to establish a basic knowledge of administrative skills for project management and KPIs.
- Financial training: to gather the expertise and tools to handle the costing of projects, budgets, and basic day-to-day operations of a weather service.

4.4. Gender and CSOs considerations

It is a well-known fact that weather and climate disasters affect those most vulnerable, and gender, age and illness are critical factors that may exacerbate the impacts. The integration of gender perspectives with the involvement of civil society must be included in all aspects, especially when it comes to a government-based institution. This integration should be covered at governance, policymaking, development and dissemination and response levels and should have participative approaches to facilitate the engagement and give the voice to those usually unrepresented.

It is therefore important to bring in the Civil Societies Organisations (CSOs), which include community-based Organisations and Non-Governmental Organisations (NGOs) in a participative approach to embed the considerations related to gender and specific vulnerabilities right from the start. CSOs will be particularly important at the time of identifying both potential staff, supporting staff and, to be included in the training programmes and any related activities. Within the investment phase, it is recommended to initiate a complete gender assessment that should be repeated at the end of the phase to monitor the progression and success of the implemented actions. Gender balance will be encouraged at every procurement and training action with a growing quota with the years.

Though already now, the current staff of ANM consists of 35% females, an internal quota for the SOFF activities will be sought to ensure as much as possible that at least 35% (and preferably closer to 50%) of the staff related to SOFF are female and that in the stakeholder's engagement workshops the female contributions are visible. Both at Implementing Entity and Peer Advisor level, this equity will be reinforced at all steps of SOFF related activities.

Moreover, as CSOs are, in most cases, the recipient of weather services to support their activities, the CSOs are particularly important at the time. They need, therefore, to be considered in weather-related outreach programs. SOFF's key objective is the improvement of warnings of high-impact meteorological events whose impacts are exacerbated on most vulnerable people (gender, elderly, sick ones). CSOs constitute the best conduits in reaching out to these most vulnerable people. Within the investment phase, it is recommended to make use of the stakeholder engagement workshops to include a specific dialogue platform for the

CSOs addressing gender opportunities while at the same time advocating for the rights of marginalized groups and more individuals that are vulnerable. For examples women organizations, Priests and Imams, villages Chiefs would be invited to these workshops to increase sensibility and understanding of the local communities on the importance of the data collected from the system for their safety, decision-making and food security and potential role they could play in securing the availability of data (e.g., caretaker role to reduce vandalism). The outcomes of the workshops are to be included as formal recommendations for the SOFF activities and be used as guidelines to promote equity and equality. To this aim, an initial dialogue, with the International Federation of the Red Cross and Red Crescent and its Anticipatory Action as well as with UN Women, will be established to act as a community liaison for these activities. It is also recommended to establish outreach activities with secondary schools and Universities to encourage women to embrace a profession in meteorology and climatology. ANM will also seek opportunities to develop internship programs to increase women and youth interest in meteorology.

UNDP integrates gender equality and social inclusion as key principles in its design and implementation. All activities in Djibouti will be based on the Gender Guidance which ensures that both women and men benefit equitably from investments in meteorological infrastructure, capacity building, and service delivery. This includes promoting women's participation in technical and decision-making roles, supporting gender-responsive training, and ensuring that climate and weather information produced under SOFF is accessible and relevant to all users, particularly women and vulnerable groups.

Proposed Activities:

Recommendations

- 1) Achieve at least 50% female participation in all capacity-building activities.
- 2) Conduct gender monitoring to track and ensure the achievement of gender indicators in the results framework.
- 3) Organize stakeholder workshops to raise awareness of the role of CSOs in SOFF implementation and their contribution to GBON.
- 4) Include women and youth representatives in advisory committees and decision-making bodies.

Module 5. Risk Management Framework

5.1 Assess the risks of the observing network and propose mitigation measures

ANM does not have a risk management framework in place, but proper management of risks is required during and after the SOFF investment phase to prevent potential setbacks and to adapt as much as possible to an emerging risk. In addition, understanding the role of the Implementing Entity, risk management should follow the internal approaches existing at Implementing Entity and that will facilitate the execution of the investment phase. Djibouti is relatively [stable politically](#) (143 out 193) compared to its neighbors (Ethiopia -181; Somalia – 187; Eritrea – 157) and it is anticipated that project implementation will go smoothly.

The table below describes the most critical risks that may be encountered to be added to those presented in the business model selection.

Risk	Risk level	Likelihood	Impact	Risk Mitigation Measures
<i>Financial risk - Non-compliance with fiduciary and procurement standards in some SOFF activities</i>	<i>Medium</i>	<i>Possible</i>	<i>Major</i>	<i>Support by Implementing Entity.</i>
<i>Envrionmental risk - SOFF-funded investments cause environmental or social impacts</i>	<i>Low</i>	<i>Unlikely</i>	<i>Minor</i>	<i>No major impact expected here.</i>
<i>Operational risk - NMHS staff depart after being trained</i>	<i>High</i>	<i>Likely</i>	<i>Major</i>	<i>Adequate salary, equipment and working space needed.</i>
<i>Operational risk – security-related restrictions or incidents may cause delays in project implementation</i>	<i>Low</i>	<i>Unlikely</i>	<i>Major</i>	<i>Activities should be planned in close coordination with national security authorities and relevant foreign partners, ensuring timely access and safe movement of</i>

				<i>personnel and materials.</i>
<i>Operational risk – Delays in Implementation Due to Lack of Constant Power Supply</i>	<i>Medium</i>	<i>Likely</i>	<i>Major</i>	<i>Project sites could be equipped with backup energy solutions, such as solar power systems</i>
<i>Operational Risk – Communication & Internet connectivity</i>	<i>High</i>	<i>Likely</i>	<i>Major</i>	<i>Establish redundant communication channels (e.g., satellite phones, mobile networks),</i>
<i>Operational risk - Slow implementation and delays in procurement, installation and capacity building activities</i>	<i>High</i>	<i>Likely</i>	<i>Major</i>	<i>Strong support by IE, realistic planning, and periodical progress reports needed.</i>
<i>Compliance risk - After the conclusion of the Investment phase, GBON data are not collected or shared or are shared of insufficient quality</i>	<i>Medium</i>	<i>Possible</i>	<i>Major</i>	<i>Before the start of the investment phase, a legal framework and national strategy for ANM and political buy are needed. Ensure telecom subscription is valid</i>
<i>Operational risk - Destruction or theft of SOFF-financed equipment and infrastructure</i>	<i>Low</i>	<i>unlikely</i>	<i>Major</i>	<i>Station deployment at the airport benefiting from high security</i>
<i>Reputational risk - Countries cannot make optimal use of data, including accessing or using improved forecasts products from the Global Producing Centers throughout the hydromet value chain</i>	<i>High</i>	<i>likely</i>	<i>Moderate</i>	<i>Management training and training plan for technical staff</i>

<i>Environmental and climate risk - Meteorological conditions that affect the deployment of activities by limiting accessibility to sites and constructions as needed.</i>	<i>Medium</i>	<i>High</i>	<i>Major</i>	<i>Adaptation of the timings and flexibility in the phased approach fulfilling the milestones consecutively. Consider meteorological conditions in the planning phase</i>
<i>Operational risk- Limited availability of potential staff members to be trained to ensure full operations of the station</i>	<i>High</i>	<i>Moderate</i>	<i>Major</i>	<i>Ensure a sufficient number of staff is secured and the training plan is followed; outreach to secondary schools and higher education facilities</i>

Module 6. Transition to SOFF investment phase

Coordinated approach with the CREW project which will implement 4 AWS for ANM.

Summary of GBON National Contribution Plan

Components	Recommended activities
Module 2. GBON business model and institutional development	1. Lobbying the government for appropriate funding of ANM to ensure sustainability of operations – Adopting a fully public business model 2. CREWS, SOFF and GCF projects to coordinate procurement, installation of equipment and training of technical personnel 3. Collaborate with WMO RAI and ANAM Chad for the implementation of WIS2.0 in a box 4. Coordinate with DG ANM for the Minister of Equipment and Transports to seek from the Minister of Finance the lifting of excise taxes on observations equipment and spare parts
Module 3. GBON infrastructure development	1. Ensure SOFF station is fenced to deter from vandalism 2. Use of GPRS for telecommunication of data from station to ANM 3. SOFF station acquisition should be based on CREWS project acquisition process as it will begin implementation first – Same specification (see Annex 2) 4. Acquire the upper air station system used by ASECNA (hydrogen generator type) and related consumables and spare parts 5. Ensure data from the station can be read by ANM servers
Module 4. GBON human capacity development	1. Hire at least two (2) IT experts to manage the ICT system 2. Ensure the development of a training program in collaboration with CREWS 3. Conduct station maintenance training 4. Management to be trained in Leadership skills, decision-making project management and communication as well as in financial management – consider exchange visit at Peer Advisor facilities and at WMO
Module 5. Risk Management	1. Through the Implementing Entity and supported by the Peer Advisory and Beneficiary Country, monitor the evolution of the investment phase through the identified risks and initiate mitigation actions as required. 2. Inclusion of reputable institutions through coordination of the Implementing Entity to assist in the execution of the investment phase.
Module 6. Transition to SOFF investment phase	Transition performed in a coordinated manner with the beneficiary country, the implementing entity, and the Peer Advisor following the agreed National Contribution Plan. The funding request will be also based on the activities agreed in this National Contribution Plan.

Annexes

Annex I

LAW on the Reorganization of the Ministry of Equipment and Transports

Loi n° 108/AN/10/6ème L portant réorganisation du Ministère de l'Équipement et des Transports et fixant leurs attributions.

Edition n° 1 du 15/01/2011

*L'ASSEMBLÉE NATIONALE A ADOPTÉ
LE PRÉSIDENT DE LA RÉPUBLIQUE PROMULGUE
LA LOI DONT LA TENEUR SUIT :*

VU La Constitution du 15 septembre 1992 ;
VU La Loi n°5/AN/03/5ème L du 31 mars 2003 ponant organisation du Ministère de l'Équipement et des Transports et fixant leurs attributions ;
VU Le Décret n°2008-0083/PRE du 26 mars 2008 portant nomination du Premier Ministre ;
VU Le Décret n°2008-0084/PRE du 27 mars 2008 portant nomination des membres du Gouvernement ;
VU Le Décret n°2008-0093/PRE du 03 avril 2008 fixant les attributions des Ministères ;
VU Le Décret n°2009-039/PRE du 19 février 2009 portant création d'unité des Gardes-côtes ;
VU Le Décret n°2009-075/PR/MET du 19 avril 2009 portant création d'un Centre Régional de Formation Maritime ;
Le Conseil des Ministres entendu en sa séance du 01 Juin 2010.

TITRE I : Organisation et attributions

Article 1 : Le Ministère de l'Équipement et des Transports élabore, coordonne et met en œuvre la politique du Gouvernement en matière d'équipements publics de transport, notamment les infrastructures, et de services de transport aérien, ferroviaire, maritime, routier et de météorologie nationale.

Le Ministère de l'Équipement et des Transports est également responsable :

- d'assurer la mise en place des moyens de coordination, de contrôle et d'évaluation des interventions du Ministère dans le domaine de sa compétence ;
- d'assurer le fonctionnement général du secteur dont il établit la réglementation et veille à son application ;
- de conduire les négociations internationales et veiller à l'exécution des accords internationaux auxquels la République de Djibouti a adhéré ;
- de la gestion du patrimoine immobilier de l'État ;
- de la gestion du patrimoine civil roulant de l'État.

Article 2 : Le Ministère de l'Équipement et des Transports dispose pour mettre en œuvre la politique du gouvernement dans ses domaines de compétences :

- d'un Cabinet et d'un Secrétariat Particulier ;
- de l'Inspection Générale du Ministère ;
- d'une administration centrale placée sous l'autorité d'un secrétaire général ;
- des organismes sous tutelle.

Article 3 : Les Entreprises et Organismes publics suivants sont rattachés au Ministère de l'Équipement et des Transports :

- le Chemin de fer Djibouto – Ethiopien (société binationale) ;
- les Ports de Djibouti ;
- l'Aéroport International de Djibouti ;
- le Centre Régional de Formation Maritime et de la Documentation ;
- les Gardes Côtes ;
- l'Autorité de l'Aviation Civile ;
- l'Agence Nationale de la Météorologie ;
- l'Agence des Routes ;
- Société Djiboutienne de Chemin de Fer ;
- Société de Gestion des Ports Secondaires ;
- le Laboratoire Central du Bâtiment et de l'Équipement.

A ce titre, le Ministère de l'Équipement et des Transports donne à ces Entreprises et Organismes les orientations de politique générale auxquelles ils doivent se conformer, élabore les contrats de performance qui lient chacun d'eux à l'Etat et en contrôle l'exécution.

TITRE II : Le Cabinet et Secrétariat Particulier du Ministre

Article 4 : Le Cabinet du Ministre comprend un Secrétariat Particulier et des Conseillers Techniques.

Article 5 : Les Conseillers techniques assument les missions que leur assigne le Ministre et instruisent les différents dossiers qui leur sont confiés.

TITRE III : L'Inspection Générale

Article 6 : L'Inspection Générale, placée sous l'autorité du Ministre, est chargée de l'audit technique et de sécurité en matière d'équipement, d'infrastructures et de services de transport.

Article 7 : L'Inspection Générale est dirigée par un Inspecteur Général, qui a rang de conseiller technique du Ministre et est assisté d'inspecteurs qui ont rang de Directeurs centraux.

Article 8 : Les missions de l'Inspection Générale sont :

- l'inspection de la sécurité des transports et des Services du Ministère ;
- l'investigation technique relative aux accidents ferroviaires, aériens, routiers et maritimes ;
- la tenue des statistiques de ces accidents et de la sécurité routière, de la sécurité de la navigation aérienne, de la sécurité ferroviaire et de la sécurité maritime ;
- la vérification de l'efficacité de la gestion des activités de l'ensemble des services du département et des organismes sous tutelle et leur conformité aux lois et règlements en vigueur ainsi qu'à la politique et programmes d'action assignés dans les différents secteurs relevant du département ;
- l'évaluation des résultats effectivement acquis, l'analyse des écarts par rapport aux prévisions et la proposition des mesures de redressement nécessaires. Elle rend compte au Ministre des irrégularités constatées.

TITRE IV : Le Secrétariat Général du Ministère de l'Équipement et des Transports

Article 9 : Le Secrétaire Général a pour mission d'informer le Ministre sur le fonctionnement des services du Ministère. Il assume, sous l'autorité du Ministre, l'animation et la coordination de l'ensemble des services. Il veille à l'application des décisions du Ministre et lui en rend compte.

Article 10 : Le Secrétaire Général est chargé des affaires qui lui sont directement déléguées par le Ministre, mais également de :

- la circulation des informations, décisions et directives entre le Ministre, les services du Ministère et les Entreprises et Organismes publics rattachés ;
- la centralisation des informations, comptes-rendus et rapports en provenance des Directions d'administration centrale et des Entreprises et Organismes publics rattachés ;
- la coordination des activités et des programmes des services du Ministère ;
- suivi des plans annuels de travail et des programmes pluriannuels ;
- la préparation et de l'exécution du budget du Ministère, du contrôle de gestion des finances et du personnel, en liaison avec le Cabinet et la Direction Administrative et Financière ;
- la représentation, sous la responsabilité du Ministre, de l'ensemble du Ministère dans ses relations extérieures avec les autres Ministères, les Établissements, Entreprises et Organismes publics ainsi qu'avec les institutions d'aide bilatérale et multilatérale.

Dans l'exercice de ses fonctions, le Secrétaire Général est assisté par les Directions de l'Administration centrale du Ministère de l'Équipement et des Transports.

Article 11 : Le Secrétaire Général a également la responsabilité de :

- Secrétariat du Comité National de Facilitation des Transports, de l'assistance à la Commission permanente pour le suivi des propositions du Comité et de la coordination de la mise en œuvre des mesures de facilitation décidées par le Gouvernement ;
- la coordination du Programme d'ajustement sectoriel transport;
- l'élaboration et du suivi des contrats de performances à intervenir entre l'État et les Entreprises et Organismes publics qui sont rattachés au Ministère de l'Équipement et des Transports.

Article 12 : Le Secrétaire Général est habilité, après accord du Ministre, à déléguer une partie de ses attributions aux Directeurs d'Administration Centrale.

Article 13 : Le Secrétaire Général est nommé par décret pris en conseil des ministres sur proposition du Ministre de l'Équipement et des Transports. Il est mis fin à ses fonctions dans les mêmes conditions.

TITRE V : L'Administration Centrale

Article 14 : L'Administration Centrale comprend:

- la Direction Administrative et Financière ;
- la Direction des Affaires Juridiques ;
- la Direction des Equipements Publics et des Transports Terrestres ;
- la Direction de la Logistique, des études et de planification ;
- la Direction des Affaires Maritimes et des Gens de mer.

Chapitre 1 : La Direction Administrative et Financière

Article 15 : La Direction Administrative et Financière est responsable de la gestion de l'ensemble des ressources humaines, financières et logistiques mobilisées pour le fonctionnement du Ministère.

Article 16 : La Direction Administrative et Financière est chargée:

- de la gestion du personnel et le suivi de la carrière professionnelle de l'ensemble des fonctionnaires et agents des différents départements du Ministère ;

- de la tenue du répertoire des professions et métiers exercés au sein du Ministère et de l'établissement des fiches de profil de postes ou de profession requis ;
- de la définition et de la mise en œuvre d'un plan de formation permettant d'assurer l'adéquation entre les qualifications disponibles et les profils de postes ;
- de la tenue du fichier général du personnel et des fichiers spécifiques à vocations déterminées ;
- de l'entretien du matériel et des locaux ;
- de l'approvisionnement du département ;
- des fonctions d'économe pour l'ensemble du Ministère ;
- de la préparation, en collaboration avec les autres Directions, du projet budget annuel du Ministère;
- du suivi de l'exécution du budget et des autres ressources financières du Ministère, en initiant notamment les dépenses et en contrôlant leur exécution ;
- de la conduite du processus d'informatisation des différents départements du Ministère.

Article 17 : La Direction Administrative et Financière comprend les sous-directions suivantes :

- la Sous-direction des Ressources Humaines;
- la Sous-direction du Budget et de la Comptabilité;
- la Sous-direction des Moyens Généraux et de l'Informatisation des Services.

Chapitre 2 : La Direction des Affaires Juridiques

Article 18 : La Direction des Affaires Juridiques est responsable de l'élaboration, du suivi et du contrôle de l'application de la réglementation interne du Ministère pour assurer le bon fonctionnement des services du Ministère et des organismes sous tutelle.

Article 19 : Elle a pour principales missions de :

- conseiller le Ministre sur les questions juridiques dans les différents domaines d'activités du Ministère ;
- exercer une fonction de conseil, d'expertise et d'assistance juridique auprès des directions et services d'administration centrale et des services déconcentrés du Ministère ;
- collaborer sur les projets de textes législatifs ou réglementaires préparés par les directions et services et assurer le suivi des procédures d'adoption de ces textes. Elle coordonne la codification des textes législatifs et réglementaires ;
- assurer par des actions de conseil et d'assistance aux services, la qualité, la sécurité juridique et la régularité de la commande publique du ministère ;
- d'être associée à la préparation et à l'élaboration des textes internationaux et en assurer le suivi ;
- traiter le contentieux de niveau central du ministère en lien avec les directions concernées et représente le ministre devant les juridictions compétentes ;
- élaborer les termes de référence des juristes consultants lorsque le ministère décide d'avoir recours à des prestations juridiques extérieures et coordonne l'intervention des conseils juridiques ;
- assurer la diffusion des connaissances juridiques et contribue au développement des compétences dans ce domaine, notamment en participant à l'élaboration des plans de formation.

Article 20 : La Direction des Affaires Juridiques comprend les sous directions suivantes :

- Sous direction législation et réglementation ;
- Sous direction contentieux.

Chapitre 3 : La Direction des Equipements Publics et des transports terrestres

Article 21 : La Direction des Equipements Publics et des Transports Terrestres est responsable de :

- la gestion du patrimoine roulant civil de l'État, des engins des travaux publics notamment par la tenue d'un inventaire actualisé de ce patrimoine et la centralisation des besoins des différentes administrations et ministères. Et enfin de la gestion du domaine public routier et des ouvrages et équipements publics, notamment les ponts et les ouvrages de défense contre les eaux, établis sur le domaine public ;
- la mise en œuvre de la politique du Gouvernement en matière de transports terrestres et de sécurité routière. Elle exerce les fonctions régaliennes et économiques y relatives.

Article 22 : La Direction des Equipements Publics et des Transports Terrestres a pour missions de :

- l'étude, la promotion, la régulation, le contrôle et la coordination de toutes les activités pouvant concourir au développement des modes de transport terrestre et de sécurité routière, tant routier que ferroviaire ;
- la mise en œuvre d'un cadre juridique et réglementaire et de contrôler le respect de la réglementation;
- le suivi économique des secteurs, l'analyse des coûts et de la tarification ;
- le suivi de l'évolution de l'offre et de la demande, avec la publication périodique de statistiques et l'étude de plans de transport;
- la planification des investissements, en relation avec l'Agence Djiboutienne des Routes, en particulier pour l'adaptation du réseau routier ;
- l'élaboration et la mise en œuvre d'un plan d'actions pour l'amélioration de la sécurité de la circulation routière;
- l'étude des dispositions à mettre en œuvre pour promouvoir l'industrie djiboutienne du transport routier, en particulier au regard des transports à destination de l'hinterland portuaire et des transports urbains ;
- l'analyse de la fiscalité du secteur des transports routiers et des conditions d'amélioration du dispositif fiscal;
- la définition d'un programme d'aide aux petites et moyennes entreprises de transport ;
- l'élaboration de textes législatifs et réglementaires relatifs à la sécurité routière en collaboration avec la Direction des Affaires Juridiques ;
- la prévention et la coordination des accidents routiers avec l'ensemble des intervenants du secteur ;
- la politique de sensibilisation sur la sécurité routière ;
- les études et statistiques se rapportant à la sécurité routière en liaison avec les services concernés.

Article 23 : La Direction des Equipements publics et des Transports Terrestres définit et met en œuvre le dispositif de transfert d'informations depuis les services publics de production et de gestion des titres administratifs relatifs aux activités de transport afin de disposer d'une connaissance précise du parc automobile roulant et de la demande de transport. Elle doit notamment connaître l'état du parc disponible pour le transport des marchandises et des voyageurs, les fichiers des transporteurs, le fichier des permis de conduire.

Article 24 : La Direction des Equipements publics et des Transports Terrestres participe, pour les aspects de sa compétence, à la définition et à la mise en œuvre du programme de facilitation des transports sur le territoire de la République de Djibouti, dont les transports de marchandises en transit. Dans son champ de compétences, la Direction des Equipements publics et des Transports Terrestres veille à l'exécution des conventions et accords internationaux auxquels la République de Djibouti a adhéré. Elle participe à l'élaboration des accords multilatéraux ou bilatéraux auxquels la République de Djibouti doit adhérer et veille ensuite à leur exécution.

Article 25 : La Direction des Equipements publics et des Transports Terrestres instruit l'ensemble des affaires relatives au contrôle et au suivi du Chemin de fer Djibouto – Ethiopien au titre du rattachement

de cette Entreprise publique au Ministère de l'Équipement et des Transports.

Dans ce cadre, la Direction des Équipements publics et des Transports Terrestres suit la mise en œuvre du processus de concession de l'exploitation technique et commerciale du Chemin de fer sous l'autorité du Secrétaire Général du Ministère. En cas d'aboutissement de ce processus, elle veille au respect de la convention et du cahier des charges de la concession.

Article 26 : La Direction des Équipements publics et des Transports Terrestres mobilise, autant que besoin, les capacités des Antennes Régionales de l'Équipement mises en place au niveau des circonscriptions régionales.

Article 27 : La Direction des Équipements Publics et des transports terrestres est composée de quatre sous directions suivantes:

- la Sous-direction des Ressources et de la Gestion du Patrimoine;
- la Sous-direction des Transports Urbains et Interurbains de Personnes ;
- la Sous-direction des Transports Internationaux ;
- la Sous-direction de la Sécurité Routière.

Chapitre 4 : La Direction de la Logistique,
des Etudes et de la Planification

Article 28 : La Direction de la Logistique, des études et de la planification est chargée de :

- la mise à niveau des services logistiques ;
- l'élaboration d'un Programme National de Développement des Zones Logistiques Multi-Flux qui consistent en des zones d'activité logistiques regroupant un ou plusieurs types de plateformes (plateforme conteneurs, plateforme General Cargo par exemple);
- la réforme et la libéralisation des modes de transport (routier, portuaire, maritime, aérien) ;
- le développement des infrastructures de transport en application du programme National de Développement des Zones Logistiques Multi-Flux (Ports, routes, autoroutes, voies ferrées, aéroports) ;
- participer aux études relatives aux différents domaines d'activité du Ministère, en liaison avec les services compétents et les organismes chargés de ces études ;
- participer aux études et démarches relatives à la préparation des projets d'investissement et à la recherche des financements en liaison avec les services concernés du département ;
- la planification sectorielle, la programmation des investissements et les études des dépenses récurrentes ;
- la coordination des activités de planification, de programmation et d'organisation au niveau du département, le suivi en collaboration avec les différentes directions des questions relatives à la coopération bilatérale, régionale et internationale ;
- collecter, centraliser, et mettre à jour les données, informations et statistiques concernant les activités du département.

Article 29 : Pour atteindre les objectifs généraux visés ci-dessus, la mise en œuvre de la nouvelle stratégie logistique doit s'articuler autour de quatre axes clés :

- développement et mise en œuvre d'un réseau national intégré de Zones Logistiques Multi-Flux (ZLMF) ;
- mise à niveau et incitation à l'émergence d'acteurs logistiques intégrés et performants ;
- développement des compétences à travers un plan national de formation dans les métiers de la logistique ;
- mise en place d'un cadre de gouvernance du secteur et de mesures de régulation adaptées.

Article 30 : La Direction de la Logistique, des études et de la planification comprend :

- la Sous-direction de la logistique ;

- la Sous-direction Contrôle et Développement ;
- la Sous-direction des études et de la planification.

Chapitre 5 : La Direction des Affaires Maritimes et des Gens de mer

Article 31 : La Direction des Affaires Maritimes et des Gens de mer traite de toutes les questions relatives à l'organisation et au développement de la Marine Marchande, des Affaires Maritimes et du Droit de la Mer dans les eaux nationales et internationales, de la prévention et de la verbalisation de toutes les infractions à la législation nationale et internationale.

A cet effet, elle comprend deux sous directions :

- la Sous direction de l'inspection de la navigation ;
- la Sous direction de suivi des transports maritimes et des affaires générales ;
- la Sous-direction de sécurité de la navigation et des loisirs nautiques ;
- la Sous-direction Promotion, Hygiène et Sécurité des Gens de Mer.

D'une manière générale, le Directeur a autorité sur l'ensemble des services ; à ce titre, entrent notamment dans ses attributions:

- la coordination administrative des structures hiérarchisées de la Direction ;
- le contrôle et l'évaluation de la mise en œuvre des décisions, plans et projets ;
- il a compétence et responsabilité en matière de gestion des crédits mis à sa disposition ;
- il étudie, élabore et propose au Ministre des dossiers intéressant l'orientation, la mise en œuvre, l'évolution et le développement de la politique du Ministère dans les différents domaines de sa compétence.

Article 32 : La Sous direction de l'Inspection de la Navigation.

* Section réglementation :

Elle est chargée de l'élaboration des textes relatifs à :

- la sécurité des navires, hormis les unités de la force navale ;
- l'hygiène, la qualification des équipages ainsi que les enquêtes consécutives aux événements en mer ;
- le suivi de l'élaboration des conventions internationales relatives à la sécurité de la navigation avec les autres départements concernés ;
- l'élaboration et la mise en œuvre de la réglementation relative aux titres de conduite et le suivi du statut administratif des bateaux de plaisance maritimes ;
- l'élaboration et la mise en œuvre de la réglementation en matière des loisirs nautiques ;
- la réglementation des enquêtes consécutives aux événements en mer.

* Section Inspection et Contrôles :

Elle est chargée de :

- l'application et le respect de la réglementation en matière de sécurité et de navigation maritime ;
- l'instruction des enquêtes consécutives aux événements en mer ;
- l'attribution et le contrôle du permis de conduire des embarcations à moteur ;
- le Contrôle des navires au titre de l'Etat du pavillon ou au titre de l'Etat port.

Article 33 : La Sous direction de suivi des transports maritimes et des affaires générales.

Elle est chargée :

- des études et statistiques relatives aux transports maritimes et au trafic, régime fiscal des transports maritimes ;
- de la promotion du pavillon djiboutien ;
- des relations bilatérales et internationales dans le domaine du transport maritime ;

- de la gestion, de l'exploitation et de la coordination des décisions administratives du domaine public, ainsi que sa protection ;
- de la coexistence des activités maritimes autres que le commerce et de la coordination des activités de police en mer ;
- de l'octroi et du suivi de l'agrément des sociétés de classification;
- de l'immatriculation, de la djiboutisation et du jaugeage des navires ;
- de l'élaboration du statut des navires de commerce ;
- du respect de la souveraineté et des prérogatives de l'Etat sur les divers espaces maritimes.

Article 34 : La Sous direction de la sécurité de la navigation et des loisirs nautiques est chargée de :

- l'élaboration et de la mise en œuvre de la politique et de la réglementation dans les domaines de la navigation, de la sûreté et de la sécurité maritime ;
- du contrôle des règles de sécurité des navires à passagers ainsi que le contrôle du transport par mer des marchandises dangereuses ;
- l'approbation des plans de sûreté des navires Djiboutiens ;
- l'hydrographie et de la signalisation maritimes à savoir les études, la construction, l'entretien et le fonctionnement des phares et balises ;
- la prévention et la lutte contre la pollution marine, notamment la Prévention des accidents de pétroliers par la mise en œuvre du plan POLMER ;
- le pilotage de l'actualisation, en concertation avec les autres administrations concernées du plan national POLMER et de veiller à l'actualisation des plans des opérateurs pétroliers et portuaires ;
- suivi en concertation avec les structures concernées, des questions relatives au sauvetage côtier et hauturier ;
- la lutte contre la pollution des hydrocarbures et des produits dangereux ;
- la création et la mise en place d'un Centre National de lutte contre la pollution ;
- l'instruction des enquêtes consécutives aux événements en mer;
- la diffusion des informations météorologiques marines ;
- la surveillance générale des approches maritimes, du domaine littoral, du domaine public maritime et de l'ensemble des activités qui y sont liées ;
- la planification d'actions afin que le développement des loisirs nautiques puisse s'inscrire dans la durée et notamment le respect de l'environnement marin.

Article 35 : La Sous direction Promotion, Hygiène et Sécurité des Gens de Mer est chargée de :

- la gestion de l'immatriculation des Gens de Mer ;
- la santé, l'hygiène et la Sécurité des Gens de Mer. ;
- l'organisation des professions maritimes liées au transport maritime, aux ports et aux activités connexes, et de l'application de la réglementation relative à ces professions ;
- l'élaboration des dispositions législatives et réglementaires régissant le travail des gens de mer et de veiller à leur bonne application ;
- l'inspection du travail maritime ;
- le règlement des conflits du travail maritime ;
- la mise en place d'un régime social des Gens de Mer ;
- la protection de la santé et la prévention des risques professionnels.

TITRE VI : L'Autorité de l'Aviation Civile

Article 36 : Il est créé une structure administrative, dénommée " L'Autorité de l'Aviation Civile " dotée de l'autonomie financière et de gestion.

Article 37 : Un président de l'Autorité de L'Aviation Civile, nommé par décret, exerce le pouvoir exécutif dans les limites des pouvoirs qui lui sont délégués par le Conseil, la Commission et le Comité

éventuellement.

Il engage l'Autorité par sa signature vis-à-vis des tiers et est habilité à ester en justice au nom de l'Autorité de l'Aviation Civile

Article 38 : Les missions de l'Autorité de l'Aviation Civile.

Elle est chargée notamment de :

- l'exécution de la politique de l'Etat en matière d'aviation civile ;
- la promotion de l'aviation civile dans le pays ;
- la négociation des accords internationaux dans le cadre des habilitations et mandats spéciaux conférés par l'Etat ;
- suivi de la gestion du patrimoine foncier de l'Etat affecté à l'aviation civile ;
- la gestion du portefeuille des droits de trafic issus des accords aériens signés par l'Etat ;
- la participation au développement de l'économie nationale, et à l'amélioration de la sécurité, de l'efficacité et de la régularité du transport aérien international ;
- la supervision de la sécurité par l'élaboration d'une réglementation technique de l'aviation civile conformément aux normes de l'Organisation de l'Aviation Civile Internationale (OACI) ;
- l'application et le contrôle de la réglementation nationale en vigueur et des conventions internationales signées et ratifiées par l'Etat de Djibouti ;
- la sûreté de l'aviation en veillant au développement et la coordination de la mise en œuvre de la réglementation nationale et internationale.

Article 39 : L'Autorité de l'Aviation Civile délibère soit :

- En Conseil pour les questions de gestion courante. Le Conseil est composé d'un président, qui est le Président de l'Autorité de l'Aviation Civile et des 3 autres membres.
- En Commission lorsqu'elle délibère en matière de réglementation et de régulation de l'aviation civile. La Commission est composée des membres du Conseil, du Ministre de tutelle, du Directeur de l'Aéroport International de Djibouti et du GTA. Elle est présidée par le Ministre de l'Equipeement et des transports.
- En Comité lorsqu'il y a atteinte à la sécurité aéroportuaire et à la sûreté aérienne. Le Comité est composé des membres de la Commission et des représentants des Ministères concernés. Il est présidé par le Chef de la Sécurité Nationale.

TITRE VII : L'Agence Nationale de la Météorologie

Article 40 : Création de l'Agence Nationale de la Météorologie.

Il est créé un Etablissement Public à caractère scientifique ayant une personnalité morale, dotée d'une autonomie de gestion administrative et financière, dénommée " Agence Nationale de la Météorologie ", placée sous l'autorité du Ministre de l'Equipeement et des Transports.

Article 41 : L'Agence Nationale de la Météorologie est constituée de :

- Conseil d'Administration ;
- Direction générale de la météorologie.

Article 42 : Les missions de l'Agence Nationale de la Météorologie.

Elle est chargée notamment :

- de coordonner et de contrôler toutes les activités météorologiques ;
- de gérer les engagements de l'Etat en matière de météorologie ;
- de négocier les accords bilatéraux et multilatéraux dans le cadre des habilitations et mandats conférés par l'Etat ;
- d'exploiter et d'assurer l'inspection régulière ainsi que la maintenance de l'ensemble des stations météorologiques y compris les postes pluviométriques répartis sur le territoire national ;

- d'élaborer une réglementation et de veiller à son application, conformément aux normes de l'Organisation Météorologique Mondiale (OMM) ;
- d'animer et de coordonner l'ensemble des opérations de recherche appliquée et de recherche fondamentale en matière de météorologie en mettant en place une base de données météorologiques et climatologiques ;
- de conduire les activités portant sur la modification artificielle du climat ;
- de satisfaire les besoins en assistance météorologique nécessaires à la sécurité aéronautique et maritime ;
- d'observer le comportement de l'atmosphère, d'en prévoir les évolutions et de diffuser les informations correspondantes ;
- de veiller à la sécurité météorologique des personnes et des biens et de l'assistance météorologique à tous les secteurs socio-économiques du pays ;
- de mettre en œuvre un système de collecte, de concentration, de traitement, de prévision, d'archivage et de diffusion des données lui permettant d'accomplir ses missions ;
- de contribuer à la sécurité alimentaire à la gestion des ressources naturelles, de l'environnement et au développement des secteurs socio-économiques.

Article 43 : Les statuts de l'Agence Nationale de la Météorologie relatifs à son organisation et son fonctionnement sont fixés par voie réglementaire.

TITRE VIII : Agence Djiboutienne des Routes

Article 44 : Création de l'Agence Djiboutienne des Routes.

Il est créé une personne morale de droit public dénommée "Agence Djiboutienne des Routes (ADR)", entreprise publique, dotée d'une autonomie administrative et financière, placée sous l'autorité du Ministre de l'Équipement et des Transports.

Article 45 : L'Agence Djiboutienne des Routes est constituée de:

- Conseil d'Administration ;
- Direction générale des routes.

Article 46 : Les missions de l'Agence Djiboutienne des Routes.

Elle est chargée :

- d'assurer toutes les missions et prérogatives inhérentes à l'ancienne Direction de l'équipement et du Fonds d'Entretien Routier;
- d'assurer la réalisation, l'équipement et l'aménagement du réseau routier ;
- de veiller au respect des règles techniques et normes de conception, de construction et d'aménagement des projets ;
- de réaliser et d'assurer le suivi des études de conception, de faisabilité d'avant-projet et d'exécution de tous travaux ;
- de développer l'ingénierie des ouvrages, ainsi que ses moyens de conception et d'étude ;
- de constituer les dossiers de consultation des entreprises d'études de réalisation et d'équipement des infrastructures.

Article 47 : Les statuts de l'Agence Djiboutienne des Routes relatifs à son organisation et son fonctionnement sont fixés par voie réglementaire.

TITRE IX : Société de Gestion des Ports Secondaires

Article 48 : Il est créé un Etablissement public à caractère administratif, personne morale de droit public dénommée " Société de Gestion des Ports secondaires (SGPS) ", dotée d'une autonomie de

gestion et investie d'une mission de service public.

La Société de Gestion des Ports secondaires est placée sous la tutelle du Ministre de l'Equipement et des Transports.

Article 49 : La Société de Gestion des Ports secondaires est chargée de :

- la gestion technique, financière et humaine du Ferry assurant la liaison avec les deux régions maritimes du nord du pays (Tadjourah et Obock) ;
- la gestion des ports secondaires et de leurs infrastructures ;
- la promotion et la mise en œuvre de la politique gouvernementale dans ce secteur ;
- l'étude et la planification des projets des installations maritimes;
- l'étude, l'exécution et le contrôle des travaux correspondants ;
- la collecte de toutes les données concernant les infrastructures portuaires secondaires ;
- le suivi et l'évaluation de l'état des ports maritimes secondaires;
- la construction et l'entretien des infrastructures maritimes essentielles ;
- la planification, développement et gestion des ports secondaires;
- le contrôle et la gestion des travaux de construction, de réhabilitation des ports secondaires ;
- la préparation et le suivi des contrats de travaux d'entretien des ports maritimes secondaires ;

Article 50 : Les statuts de la Société de Gestion des Ports Secondaires relatifs à son organisation et son fonctionnement sont fixés par voie réglementaire.

TITRE X : Dispositions finales

Article 51 : Les conseillers techniques et les Directeurs d'administration centrale sont nommés par Décrets pris en Conseil des Ministres sur proposition du Ministre de l'Equipement et des Transports. Les Sous Directeurs du Ministère de l'Equipement et des Transports sont nommés par décision ou arrêté du Président de la République et sur proposition du Ministre de l'Equipement et des Transports.

Article 52 : Les modalités d'application de la présente loi sont fixées par décret dans un délai de six mois.

Article 53 : Sont abrogées la Loi n°5/AN/03/5ème L du 31 mars 2003 portant organisation du Ministère de l'Equipement et des Transports et fixant leurs attributions ainsi que toutes dispositions antérieures contraires aux dispositions de la présente Loi.

Article 54 : La présente Loi sera publiée au Journal Officiel de la République de Djibouti dès sa promulgation.

Le Président de la République,
chef du Gouvernement
ISMAÏL OMAR GUELLEH

ORGANIGRAMME DU MINISTERE



Informations légales

- Mentions légales
- Politique de confidentialité

Lien exrternes

- Présidence
- Egouv
- Ansie

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Annex II

Décret N° 2012-167/PR/MET portant mission et organisation de l'Agence Nationale de la Météorologie de Djibouti.

LE PRESIDENT DE LA REPUBLIQUE, CHEF DU GOUVERNEMENT

VU La Constitution du 15 Septembre 1992 ;
VU La Loi n°2/AN/98/4ème L portant sur la définition et la gestion des Etablissements Publics ;
VU La Loi n°12/AN/98/4ème L réforme des sociétés d'Etat, des sociétés d'économie mixte et des Etablissements publics à caractère industriel et commercial ;
VU La Loi n°116/AN/80 du 30 mars 1980 portant création d'une Direction de l'Aviation Civile et de la Météorologie et fixant ses attributions ;
VU L'Ordonnance n°77-048/PR du 26 octobre 1977 portant création de l'Etablissement Public " Aéroport de Djibouti " ;
VU Le Décret n°99-0077/PR/MFEN portant réforme des sociétés d'Etat, des sociétés d'économie mixte et des Etablissements publics à caractère industriel et commercial ;
VU la Loi n°108/AN/10/6ème L portant Réorganisation du Ministère de l'Equipement et des Transports et fixant ses attributions et particulièrement son Titre I Article 3 et son VII Portant " Création de l'Agence Nationale de Météorologie ;
VU Le Décret n°2011-066/PRE du 11 juin 2011 portant nomination du Premier Ministre ;
VU Le Décret n° 2011-067/PRE du 12 juin 2011 portant nomination des membres du Gouvernement et fixant leurs attributions ;
Le Conseil des Ministres entendu en sa séance du 28 février 2012.
SUR Proposition du Ministre de l'Equipement et des Transports.

Article 1 : Nature de l'Etablissement

L'Agence Nationale de la Météorologie créée par la Loi n° 108/AN/10/6 portant réorganisation du Ministère de l'Equipement et des Transports est un Etablissement public à caractère Administratif chargé d'une mission de service public.

L'Agence est dotée d'une personnalité morale et jouit d'une autonomie de gestion financière et comptable dans l'exercice de sa mission de service public.

L'Agence Nationale de la Météorologie est placée sous la tutelle du Ministère de l'Equipement et des Transports qui définit la politique et la stratégie en matière des outils et moyens à mettre en œuvre pour assurer la couverture informationnelle en matière de météorologie.

Article 2 : Missions

L'Agence Nationale de la Météorologie a pour mission de collecter les données, les centraliser et enfin coordonner les activités météorologiques au niveau national.

L'Agence est chargée d'assurer la couverture informationnelle complète en matière des données météorologiques pour tous les acteurs nationaux en droit de les disposer de part leurs activités professionnelles.

L'Agence Nationale de la Météorologie sera le Point Focal de la République de Djibouti auprès de l'Organisation Météorologique Mondiale et des divers organes régionaux et internationaux connexes.

L'Agence est chargée de la mise en œuvre des programmes et activités de l'OMM à l'échelle nationale.

Article 3 : Réseaux de Stations d'Observations

L'Agence Nationale de la Météorologie a l'obligation de mettre en place les réseaux de stations d'observations météorologiques synoptiques, climatologiques, agro météorologiques et

pluviométriques et de les maintenir en état de fonctionnement de façon permanente et sans discontinuité afin d'assurer sa mission.

Article 4 : Organisation et Services

Pour assurer les missions qui lui sont assignées, l'Agence Nationale de la Météorologie sera composée d'une Direction Générale dotée d'un Service administratif et financier, et plusieurs Services Techniques.

a) Service administratif et financier

- Pour rationaliser et gérer les ressources humaines, matériels et financiers mis à la disposition de l'Agence pour répondre aux obligations contenues dans les cahiers de charge.

b) Services Techniques

- Pour initier et conduire les études scientifiques et techniques relevant de sa mission en vue de développer des outils d'aide et d'assistance au développement économique et social.

- Pour fournir des prestations de services d'assistance météorologique à tous les secteurs économiques du pays notamment à la navigation aérienne, à la navigation maritime, à l'agriculture, à l'environnement, à la gestion des catastrophes naturelles, aux médias et aux secteurs privés.

- Pour la maintenance et gestion des installations et équipements météorologiques à l'échelle nationale, des moyens de communications et du réseau informatique.

Article 5 : De la Coopération Nationale, Régionale et Internationale

L'Agence Nationale de la Météorologie peut passer tout contrat ou convention avec les collectivités locales, les organismes, établissements, entreprises publiques ou privées, les services et institutions météorologiques régionaux et internationaux en vue d'effectuer à leur profit ou de leur faire effectuer à son profit des recherches, études, essais ou travaux ayant rapport avec sa mission. L'Agence Nationale de la Météorologie peut entretenir des relations scientifiques et techniques avec les services et institutions météorologiques régionaux et internationaux afin de bénéficier des échanges d'informations et améliorer la qualité de ses prestations. En particulier l'Agence Nationale de la Météorologie devra assurer la représentation de la République de Djibouti au sein des divers programmes de l'Organisation Météorologique Mondiale (OMM) avec le strict respect des protocoles en vigueur.

Article 6 : Du Conseil D'Administration

Le Conseil d'Administration constitue l'organe de gestion et de contrôle de l'Agence. Il dispose de tous les pouvoirs traditionnels pour prendre les décisions qui s'imposent pour que l'Agence puisse remplir sa mission. Dans les limites posées par le Décret n°99-0078/PR/MFEN portant sur la définition et la gestion des établissements publics à caractère administratif, Le conseil d'administration a compétence pour :

- voter les budgets, autoriser la souscription d'emprunts, arrêter les tarifs des prestations et approuver les marchés ;

- établir l'organigramme de l'établissement, définir la politique salariale et les conditions de rémunération du personnel ;

- approuver les comptes financiers ;

- déterminer la politique générale, économique et financière de l'établissement conformément aux orientations stratégiques définies pour le secteur concerné par le gouvernement ;

- examine et prend en compte les recommandations émises par le Conseil Scientifique.

Il se réunit au moins trois fois dans l'année.

- Il examine et vote le budget de l'Agence présenté et préparé par la Direction Générale pour l'exercice à venir au plus tard le 30 novembre.

- Il examine et approuve les comptes financiers de l'exercice précédent au plus tard le 31 mars.

- Il se réunit si besoin pour examiner la situation de l'établissement avant le 30 juin.

Article 7 : Composition du Conseil d'Administration

Sont membres du Conseil d'Administration de l'Agence Nationale de Météorologie :

- un Représentant de la Présidence ;

- un Représentant de la Primature ;

- un Représentant du Ministère de l'Équipement et des Transports

- un Représentant du Ministère de l'Économie et des Finances ;

- un Représentant de l'Aviation Civile ;

- un Représentant de l'Aéroport Int. De Djibouti ;

- un Représentant du Ministère de l'Agriculture ;

- un Représentant du CERD ;

- un Représentant Ministère de l'Intérieur.

Le Conseil élit en son sein un Président et un vice Président lors du Premier Conseil Extraordinaire.

Article 8 : Du Conseil Scientifique

Le Conseil Scientifique est l'organe de consultation, de réflexions et d'orientation en matière de recherches scientifiques en liaison avec les missions de l'Agence. Il se réunit au moins deux fois dans l'année à l'initiative de son président pour examiner l'évolution des activités de l'Agence en matière technique et scientifique.

Le Conseil produit un rapport sous forme de bilan technique annuel et émet des recommandations transmises au Conseil d'Administration. Les domaines de recherches scientifiques de l'Agence seront ceux relevant de la météorologie, de la climatologie et des disciplines connexes (agro météorologie, hydrométéorologie, bioclimatologie etc....)

Article 9 : De la Composition du Conseil Scientifique

Sont membres du Conseil Scientifique :

- le Doyen de la faculté des Science de l'Université de Djibouti ;
- le Directeur Général du CERD ;
- le Directeur de l'Environnement ;
- le Directeur du Secrétariat Exécutif de la Gestion de Risques des Catastrophes (SEGRC) ;
- le Directeur de l'Eau.

Le Conseil élit en son sein un Président et un vice-président. Le Secrétariat est assuré par un Directeur des Départements Techniques de l'Agence.

Article 10 : De la Direction Générale

La Direction Générale est l'organe de gestion dans tous les domaines relatifs au bon fonctionnement de l'Agence.

La Direction dispose des ressources humaines, matérielles et financières nécessaires pour accomplir et réaliser ses missions.

Article 11 : De la Composition de la Direction Générale

La Direction Générale est composée de :

- un Directeur Général ;
- un Directeur Général Adjoint Technique ;
- un Directeur Administratif et Ressources Humaines ;
- un Secrétariat.

Article 12 : Du Directeur Général

L'Agence Nationale de la Météorologie est dirigée par un Directeur Général.

Il représente l'Agence Nationale de la Météorologie vis-à-vis des tiers et en justice ;

Il peut déléguer sa signature selon le Décret sur la gestion des établissements.

Il a autorité dans le cadre des règlements généraux applicables au personnel de la Fonction Publique et de la Convention Collective sur tout le personnel qu'il administre ;

Il met en application les délibérations du Conseil d'Administration adoptées par les arrêtés pris en Conseil des Ministres.

Il est ordonnateur du budget de l'Agence.

Le Directeur est responsable de l'exécution du programme des travaux proposés par le Conseil Scientifique et adoptés par le Conseil d'Administration.

Le Directeur de l'Agence Nationale de la Météorologie est nommé par décret sur proposition du Ministre de l'Équipement et des Transports.

Le Directeur Adjoint est nommé sur proposition du Directeur Général et soumis à l'approbation du Ministre de tutelle.

Il délègue ses attributions au Directeur adjoint Technique.

Article 13 : L'Agent Comptable

L'agent Comptable de l'Agence Nationale de la Météorologie sera nommé par arrêté pris en Conseil des Ministres, sur proposition du Ministre des Finances, il sera chargé :

- de tenir les écritures de l'Agence Nationale de la Météorologie conformément aux règles de la comptabilité publique ;

- d'exécuter la totalité des opérations comptables et financières de l'Agence Nationale de la Météorologie ;
- de produire et fournir un compte de résultats, un bilan et une situation de Trésorerie périodiques de l'Agence Nationale de la Météorologie ;
- d'assurer la garde et la conservation de l'ensemble des pièces comptables.

Article 14 : Des Ressources et des Dépenses de l'Agence

Le budget de l'Agence Comprend :

Au niveau des ressources

- dotations des ressources et subventions en provenance du budget de l'Etat ;
- redevances en provenance des Opérateurs des Aéroports Nationaux et de l'Aviation Civile pour les prestations de services météorologiques aéronautiques rendues, fixées par le Gouvernement sur la base des textes OACI / OMM en vigueur ;
- recettes des prestations des services rendues aux tiers ;
- dons et legs des organismes privés ou publics.

Au niveau des dépenses

- les Frais du personnel
- les Frais Achats des matériels et équipements météorologiques
- les Frais d'entretien et de maintenance des matériels et équipements.
- les Frais Achats des Consommables
- les Dotations aux amortissements
- les Dotations aux Provisions

Article 15 : De l'Organisation

Pour l'accomplissement de sa mission, l'Agence Nationale de la Météorologie comprend :

- un Directeur Général ;
- un Directeur Général Adjoint Technique ;
- un Secrétariat ;
- un Département Administratif et Ressources Humaines ;
- services Techniques et Scientifiques.

Article 16 : Des Services Techniques

* Un Service de météorologie aéronautique chargé de :

- assurer la protection des vols ;
- assister à la sécurité de la navigation aérienne ;
- fourniture des prestations de services d'assistance et de protection à l'aviation civile et militaire
- de l'élaboration des protections météorologiques pour la navigation aérienne ;
- du briefing des situations météorologiques aux équipages des aéronefs.

Le service de la météorologie aéronautique comprend :

- la section de prévisions aéronautiques ;
- la section de la protection ;
- la section d'observation ;
- la section de cartographie ;
- la section des transmissions ;
- la section de réception et d'interprétation des imageries satellitaires ;
- la section de climatologie aéronautique.

Un Service de prévisions et des communications chargé de :

- du rassemblement et de la transmission vers les centres météorologiques étrangers des messages météorologiques synoptiques en provenance du réseau des stations synoptiques du pays, conformément aux procédures en vigueur en la matière de l'Organisation Météorologiques Mondiale ;
- de la réception des messages météorologiques synoptiques en provenance des centres météorologiques étrangers, nécessaires aux prévisions météorologiques ;
- de la gestion et traitement des données météorologiques pour établir des prévisions fiables ;
- de la préparation des cartes et diagrammes de météorologie synoptique ;
- de la prévision du temps et de l'élaboration de bulletins météorologique pour la presse écrite, la radio, la télévision et d'autres usagers autres qu'aéronautiques et maritimes ;
- de l'installation, de la maintenance et de la réparation des équipements de télécommunication de l'Agence nationale de la météorologie ;
- De la surveillance du climat et de la prévision des pluies, catastrophes naturelles (sécheresse,

inondations. etc.).

Le service de climatologie et de la météorologie appliquée comprend :

- la section de gestion et traitement des données climatologiques et pluviométriques ;
- la section d'Agro météorologique, Hydrométéorologique et Études, recherches scientifiques ;
- la section de surveillance du climat et des catastrophes naturelles.

*Un Service informatique et gestion des réseaux.

- de la gestion centralisée du réseau informatique de tous les services de l'Agence et des stations synoptiques ;
 - rassembler, conserver et informatiser les données fondamentales et tous les résultats obtenus grâce aux traitements de ces données et tenir à jour un inventaire de tous les renseignements disponibles, y compris les données météorologiques qui peuvent être recueillies sur le plan national par d'autres organismes ou institutions.
 - mettre les données à la disposition des chercheurs et des utilisateurs tels que ceux de l'Agriculture, l'Hydrologie, de l'Industrie, des Transports, du CERD, de l'UDD, etc...
- Le service informatique comprend :
- la section de gestion du réseau et service informatique ;
 - la section des archives informatisées et documentées.

* Un Service du réseau national et des moyens généraux.

Le service du réseau national et des moyens généraux est chargé :

- du bon fonctionnement des réseaux des stations synoptiques d'observations météorologiques, climatologiques, agro météorologiques et hydrométéorologiques.
- de l'inspection de ces réseaux ;
- de la normalisation des méthodes d'observation ;
- de la préparation des manuels d'instruction sur les instruments et les méthodes d'observation ;
- de la conception, l'acquisition, la vérification, l'étalonnage, le stockage, la fourniture, l'installation et la maintenance des instruments météorologiques ;
- de la tenue et gestion des matériels de l'atelier maintenance de la direction ;
- de procéder à des recherches et améliorations relatives aux instruments météorologiques.

Le service du réseau national et des moyens généraux comprend :

- la section de maintenance technique des réseaux et moyens de communication ;
- la section de contrôle technique des réseaux.

Le service des Prévisions et Communications comprend :

- la section de Transmission et gestion des données synoptiques ;
- la section de Prévisions Météorologiques ;
- la section du studio et de météo média ;
- la section d'exploitation de Météosat Seconde Génération (MSG).

Un Service de climatologie et de météorologies appliquées chargées de :

- maintenir en coopération avec d'autres organes faisant partie du Service météorologique ou extérieurs à celui-ci, un réseau national adéquat de stations climatologiques d'observations en surface et en altitude et de stations agro météorologiques et hydrométéorologiques ;
 - assurer la gestion et les traitements de toutes les données utiles à des fins climatologiques, pluviométriques, agro météorologiques ou hydrométéorologiques, qu'elles proviennent des stations climatologiques, pluviométriques, agro météorologiques ou de stations spéciales ;
 - vérifier dans la mesure du possible, la concordance et l'exactitude des données recueillies ;
- traiter par des méthodes mécaniques ou de toute autre manière les données recueillies
- Régulièrement, afin d'obtenir, mois par mois, année par année et pour l'ensemble du pays :

* Un tableau suffisamment complet des caractéristiques météorologiques à grandes échelles, et

* Un relevé officiel des phénomènes météorologiques locaux les plus importants et de l'occurrence d'événements remarquables météorologiques avec des renseignements sur l'aspect météorologique de tels événements et sur leurs effets (pertes de vie humaines, dégâts de matériels, etc.....)

- faire paraître, sous forme de publications régulières mensuelles et annuelles un choix suffisant de renseignements, du genre susmentionné, comportant, à part des tableaux, un nombre approprié de cartes et, en tout cas dans les bulletins mensuels, une description rédigée à l'intention du grand public ;

- Analyser et interpréter les données recueillies afin de présenter une image claire, logique et suffisamment complète des conditions climatiques du pays et de donner des renseignements sur le sujet des variations climatiques ;

- de la participation aux activités et aux études scientifiques nationales et internationales dans le domaine du climat, de l'agriculture oasienne, hydrologie et de l'environnement.

Article 17 : Abrogation des Dispositions Contraires

Sont abrogées et considérées caduques toutes les dispositions contraires au présent décret qui fait en matière d'organisation des activités de la Météorologie en République de Djibouti.

Article 18 : Dispositions finales

Le Ministre en charge du budget, le Ministre de l'Equipeement et des Transports sont chargés de la mise en oeuvre des dispositions du présent décret.

Article 19 : Entré en vigueur et publication au journal officiel

Le présent décret est exécutoire dès sa signature et sera publié dans le journal officiel.

Fait à Djibouti, le 11/07/2012

Le Président de la République,
chef du Gouvernement
ISMAÏL OMAR GUELLEH

Annex III

Technical Specifications of Automatic Weather Stations

This call for tender concerns the supply, installation, commissioning, and maintenance training of four complete automatic weather stations. Each station must be equipped with a set of meteorological sensors to measure atmospheric pressure, air temperature and relative humidity, solar radiation, precipitation, and wind direction and speed. Additionally, each station must include a data acquisition and processing unit, a transmission module, an anemometric mast, and all associated cabling and accessories. These stations must be installed in observation parks to be created as part of this contract, producing and transmitting meteorological messages in compliance with the standards and recommendations of the World Meteorological Organization (WMO).

The weather stations, observation park, and all cables and accessories must be robust, capable of operating in extreme weather conditions, and made of corrosion-resistant materials, given that these stations will be installed in tropical regions, at altitudes above 1,700m and/or in coastal areas.

It should be noted that these are turnkey measurement systems, including all aspects of supply, installation, commissioning, and training. The commissioning will only be considered successful if the data and messages generated by the automatic weather stations supplied under this call for tenders are received at the central level and disseminated through the WMO Information System (WIS). The metadata of these stations must also be collected and recorded in the WMO OSCAR/Surface system.

The technical specifications are presented as numbered requirements to facilitate their reading by the contractor and to ease monitoring and control of execution.

Article 1. General Requirements for the Data Acquisition Unit, Sensors, and Data

General Requirements

- E1.1 The metals used in the manufactured parts must have suitable mechanical and chemical resistance and must be treated to resist corrosion, ensuring long-term use in a saline or saturated corrosive atmosphere.
- E1.2 The measurement of all parameters must comply with the requirements of the WMO (World Meteorological Organization) and ICAO (International Civil Aviation Organization).
- E1.3 The sensors must have the detailed characteristics listed below or better.
- E1.4 The technical specifications of the measuring instruments must comply with the requirements described in WMO Guide CIMO No. 8 (Current Version) (Requirements concerning operational measurement uncertainty and instrument performance), unless explicitly specified otherwise in this call for tenders.
- E1.5 The operating conditions of the measuring equipment are set within the ranges below unless explicitly specified in the remainder of this document:
 - Temperature: -20°C to +55°C
 - Humidity: 0 to 100%

If the measuring equipment includes an LCD display, its operational temperature range must be within +2°C to +55°C.

Requirements Related to Measurements, Data, and Their Characteristics

E1.6 Pressure Measurement:

- If, over a 60-minute period, the one-minute pressure value has not changed by 0.1 hPa, the data must be flagged as suspect for further investigation.
- If the difference between consecutive one-minute averages exceeds 0.5 hPa, the data must be flagged as suspect for further investigation. If the difference exceeds 2 hPa, the data must be flagged as erroneous to allow for a more in-depth investigation.

E1.7 Temperature Measurement:

- The maximum and minimum daily values derived from one-minute averages measured over a 24-hour period must be determined (daily max/min). The time of occurrence of the event must also be recorded.
- If the difference between consecutive one-minute averages exceeds 3°C, the data must be flagged as suspect for further investigation. If the difference exceeds 10°C, the data must be flagged as erroneous for a more in-depth investigation.
- If, over a 60-minute period, the one-minute air temperature values have not changed by 0.1°C, the data must be flagged as suspect for further investigation.

E1.8 Relative Humidity Measurement:

- If the difference between consecutive one-minute averages exceeds 10% relative humidity, the data must be flagged as suspect for further investigation. If the difference exceeds 15% relative humidity, the data must be flagged as erroneous for further examination.
- If, over a 60-minute period, the one-minute relative humidity values have not changed by 1% RH (for RH <95%), the data must be flagged as suspect for further investigation.

E1.9 Wind Measurement:

- The wind direction must be reported as the direction from which the wind is blowing. It is measured clockwise from true north (WGS-84 geodetic system and EGM96 model).
- If the average wind direction values do not vary by more than 10 degrees over a 60-minute interval, the data must be flagged as suspect for further investigation.
- If the difference between consecutive two-minute averages of wind speed exceeds 10 m/s, the data must be flagged as suspect for further investigation. If the difference exceeds 20 m/s, the data must be flagged as erroneous for a more in-depth investigation.
- If the average wind speed values do not vary by more than 0.5 m/s over a 60-minute interval, the data must be flagged as suspect for further investigation.

E1.6 Radiation Measurement:

- The parameters "sunshine duration, 1-minute average, 10-minute average, hourly exposure, and daily exposure" are calculated by the software.

- The parameter "sunshine duration" is calculated by the software.

E1.7 The table below summarizes the measured parameters and calculated parameters (required as part of this contract) along with their basic characteristics.

Data	Characteristics
Pressure	- Instant value, expressed in tenths of a hectopascal.
	- Calculation of variation slope over the previous 3 hours.
Air Temperature	- Instant value, expressed in tenths of a degree Celsius.
	- Max and min over 24 hours, according to local practices.
Relative Humidity	- Instant value, expressed as a percentage.
	- Max and min over 24 hours.
Dew Point Temperature	- Calculated based on measured data (Air Temperature and Relative Humidity).
	- Instant value, expressed in tenths of a degree Celsius.
Wind Speed	- 2-minute and 10-minute averages, expressed in knots and meters per second.
	- Gusts: Maximum speed with associated direction over 2 minutes.
	- Maximum speed with associated direction over 24 hours.
Wind Direction	- Instant value, expressed in degrees.
	- Wind rose value with at least 36 directions.
	- 2-minute and 10-minute averages.
Precipitation	- Cumulative measurement over 2 cycles, expressed in tenths of a millimeter.
	- Reset every hour.
	- Cumulative precipitation over 24 hours, following local practices.
	- Hourly accumulations according to SYNOP code.
Radiation and Sunshine Duration	- Instant global radiation value in W/m ² .
	- Hourly and daily radiation in J/cm ² .
	- Daily sunshine duration (in seconds), calculated from radiation measurements.

Requirements for Sensor Calibration

E1.8 Each calibration certificate must be recent (dated within one year of delivery) and must include at least the following elements:

- Identification of the calibrated instrument (manufacturer, model, and serial number)
- Identification of the calibration equipment with traceability details
- Date, location, and environmental conditions of calibration
- Calibration method
- Calibration coefficient and uncertainty
- Name and qualification of the signatory

E1.9 The measuring instruments for atmospheric pressure, wind, temperature, and humidity must be provided with a recent calibration certificate issued by an accredited laboratory or a laboratory with full traceability to an ISO 17025 accredited laboratory, complying with requirement E1.8 above.

E1.10 To facilitate sensor disassembly for periodic calibration shipping, the temperature, relative humidity, pressure, radiation, and precipitation sensors must have a quick connector allowing them to be disconnected without having to remove the cable from its connection to the data logger.

Article 2. Requirements for the Meteorological Sensors of the Automatic Station

1. Sheltered Air Temperature Sensor

E2.1 The air temperature measurement sensor, to be installed outdoors in a shelter at a minimum height of 1.25 m above the ground, must be capable of operating within a minimum temperature range of -10°C to 55°C, a humidity range of 0 to 100%, and wind speeds up to 50 m/s.

E2.2 The sensor type must be a metal probe (the sensitive element is a PT100 Platinum resistance or equivalent with a four-wire assembly).

E2.3 Minimum measurement range: -10°C to +55°C.

E2.4 The temperature resolution must be 0.1°C or better.

E2.5 The sensor's uncertainty must be 0.2°C or better.

E2.6 Response time must be 10 seconds or better.

E2.7 The sensor must be provided with a valid calibration certificate complying with E1.8 and E1.9 requirements.

2. Relative Humidity Sensor

E2.7 The relative humidity measurement sensor must be installed in the same shelter.

E2.8 The relative humidity sensor must be based on an electrical capacitance measurement probe.

E2.9 Measurement range: 0 to 100%.

E2.10 Resolution must be 1% relative humidity or better. If reported as dew point temperature, the resolution must be 0.1°C.

E2.11 The sensor's uncertainty must be 2% or better.

E2.12 The sensor must be provided with a valid calibration certificate complying with E1.8 and E1.9 requirements.

3. Shelter

E3.1 The temperature and humidity probes must be separate and installed in a miniature thermometer shelter.

E3.2 The thermometer shelter must have sufficient louvers to allow natural ventilation and protect the sensor from external solar radiation.

E3.3 The installation height of the thermometer screen must ensure that temperature and humidity sensors are positioned at 1.25 m above ground level.

4. Atmospheric Pressure Sensor (Barometer)

E4.1 The atmospheric pressure sensor/measurement instrument must be based on an electronic transducer installed in a waterproof housing (IP66 protection) with an air intake and equipped with an LCD screen for displaying relevant parameters (atmospheric pressure, barometric trend, history, QFE, DNH, etc.).

E4.2 The measurement range must be from 500 to 1080 hPa (for station pressure and mean sea level pressure).

E4.3 The overall uncertainty of the sensor must be 0.15 hPa or better.

E4.4 The long-term stability must be ± 0.1 hPa over 12 months.

E4.5 The resolution for atmospheric pressure and trend measurement must be 0.1 hPa or better.

E4.6 The instrument's time constant in controlled conditions must be 2 seconds.

E4.7 The sensor must include an internal temperature compensation function.

E4.8 The pressure sensor/measurement instrument can be installed at a height between 1.2 and 2.0 meters above ground level.

E4.9 The output signal from the barometer must be in the form of a digital output (RS232, RS485) or equivalent.

E4.10 The sensor must be supplied with a valid calibration certificate that meets the requirements of E1.8 and E1.9.

5. Rain Gauge

E5.1 The sensor/measurement instrument for the quantity and intensity of precipitation must be based on an electronic recording instrument. The construction of the collector must meet the requirements of the WMO, particularly in a way that minimizes the effects of evaporation and wetting.

E5.2 Type: Tipping bucket rain gauge.

E5.3 The surface area of the collector's opening must be 400 cm².

E5.4 Rain gauge resolution: 0.2 mm.

E5.5 Uncertainty: $\pm 2\%$ at 60 mm/h.

E5.6 Measurement range for precipitation accumulation: 0 to 1000 mm/day.

E5.7 Measured precipitation intensities: up to 20 mm/minute.

E5.8 The rain gauge must be supplied with a recent calibration certificate.

Rain Gauge Support Specifications

E5.9 The rain gauge must be installed on a metallic support so that the opening is perfectly horizontal at 100 cm above the ground.

E5.10 The support consists of a concrete base and a set of metallic accessories supporting the rain gauge resting on a solid cement base anchored in the ground.

E5.11 The assembly supporting the rain gauge must be made of galvanized/stainless steel.

6. Sensor for Measuring Global Solar Radiation (Pyranometer)

E6.1 The sensor/measurement instrument for global solar radiation must be based on a thermopile with an electrical output.

E6.2 The minimum spectral range must be at least 300 nm to 2800 nm.

E6.3 The instrument's response time must be better than 15 seconds.

E6.4 Zero offset A, the response to a net thermal exposure of $200 \text{ W}\cdot\text{m}^{-2}$ (ventilated), must be better than $7 \text{ W}\cdot\text{m}^{-2}$;

E6.5 Zero offset B, the response to a temperature variation of $5 \text{ K}\cdot\text{h}^{-1}$, must be better than $2 \text{ W}\cdot\text{m}^{-2}$.

E6.6 Sensitivity: $5\ldots 20 \mu\text{V}/\text{W}/\text{m}^2$

E6.6 Installation: at a height minimizing the effects of obstructions between 1 and 2 meters above the ground.

E6.7 Structure (weather-resistant and completely sealed): IP67.

E6.8 The sensor must be supplied with a valid calibration certificate that meets the requirements of E1.8 and E1.9.

7. Wind Speed and Direction Sensor

E7.1 The wind measurement system is designed to measure wind direction and speed at 10 m above the ground. The system must consist of an ultrasonic instrument, a 10 m mast, and its accessories.

E7.2 The wind speed and direction sensor must be placed at a standard height of 10 m above the open terrain [roughness length $\leq 0.03 \text{ m}$]. Open terrain is defined as any area where the distance between the anemometer and obstacles is at least 10 times the height of the nearest obstacle.

Wind Direction Measurement

E7.3 The measurement range must be from 0 to 360 degrees.

E7.4 The sensor uncertainty must be 5 degrees or better.

E7.5 The resolution for wind direction must be 1 degree.

Wind Speed Measurement

E7.6 The wind speed measurement range must be from 0 to 75 m/s.

E7.7 The sensor uncertainty must be 0.5 m/s for wind speeds ≤ 5 m/s and 10% for wind speeds > 5 m/s.

E7.8 The resolution for wind speed must be 0.5 m/s or better.

E7.9 The wind sensor must be supplied with a recent calibration certificate.

Anemometer Mast

E7.10 The wind sensors must be installed on an anemometer mast.

E7.11 The mast must be protected against lightning and grounded.

E7.12 The mast must be made of corrosion-resistant materials suitable for tropical environments. All accessories must be made of stainless materials.

E7.13 The mast height must be 10 meters above the ground.

E7.14 The mast must be supplied and installed with the necessary accessories for mounting other required components of the automatic station (enclosure, sensors, miniature shelters, transmission modules, etc.).

E7.15 The mast design must facilitate maintenance operations of the wind sensors at ground level, allowing two technicians to perform these operations easily, without requiring additional equipment or tools (e.g., a mast consisting of two parts with a tilting mechanism is preferred but not mandatory).

E7.16 The mast must be installed on a suitable concrete foundation/base using B-20 concrete.

E7.17 The mast must be constructed and installed with consideration for the installation of the following equipment:

- Waterproof cabinet (IP66) to house and protect the battery, associated charge controller, electrical protection, data logger, telecommunication modules, and pressure sensor from harsh environmental conditions, including rain, wind, dust, and extreme temperatures.
- Solar panel and sensors of the automatic station.

E7.18 The mast must be capable of operating for:

- Wind speeds up to 75 m/s,
- Humidity from 0 to 100%.

Additional Sensors for the RANDA Station:

Only for the automatic station to be installed at the RANDA synoptic weather station (Lon: 42.658416, Lat: 11.847868), the following sensors are to be provided:

Four Soil Temperature Sensors:

- E7.19 The sensors will be installed near the mast at depths of 10, 20, 50, and 100 cm below ground level.
- E7.20 The sensors will be of the type waterproof PT100 metal probes.
- E7.21 The minimum measurement range: 0 °C to +55 °C.
- E7.22 The resolution: 0.1 °C or better.
- E7.23 The sensor uncertainty must be 0.2 °C or better.
- E7.24 The soil temperature probes must be delivered with valid certificates meeting the requirements of E1.8 and E1.9.
- E7.25 The cables of the probes buried in the soil will be of sufficient length (m) and protected by dedicated sheaths for this purpose.

Two Soil Moisture Sensors:

- E7.26 The two soil moisture sensors will be installed at 20 and 50 cm below ground level.
- E7.27 The soil moisture sensors must have an IP68 protection class.
- E7.28 Measurement range: 0 to 100% VWC (Volumetric Water Content).
- E7.29 Cable length: 5 m.
- E7.30 Operating temperature: 0 °C to +55 °C.

Article 3. Requirements for the Data Acquisition and Processing System (Datalogger)**8. Data Acquisition Unit (Datalogger)**

E8.1 The primary data acquisition unit (datalogger) must include an acquisition module and ports to connect 12 to 15 sensors, including the digital and analog sensors mentioned above. It must be capable of collecting, locally processing, and archiving measurement data and transferring the data to the central system.

E8.2 It must record average data every 1 minute according to Annex 1.A of WMO No. 8. It must also record data every 10 minutes and hourly in a specific format for later transfer to the central system. It must manage communication of data between the weather station and the central system.

E8.3 The supplier must provide confirmation that the proposed model is a recent model that has been extensively tested in several locations.

E8.4 A communication port (maintenance port) allowing the connection of a laptop for maintenance interventions and for on-site data extraction.

E8.5 Processor: must be 32-bit or higher, and the internal memory must be sufficient for at least twelve months of data (minute data from all sensors connected to the data logger).

E8.6 Time synchronization via a GPS system to be delivered as part of this contract.

E8.7 Ability to manually modify the date on-site and via the central server.

E8.8 Integrated screen and keyboard.

E8.9 Communication ports: Ethernet, TCP/IP, and serial; port for external memory.

9. Data Transmission

E9.1 The systems must use TCP/IP over Ethernet as the network technology (GPRS) provided by national telecommunications providers.

E9.2 The supplier is responsible for purchasing, supplying, and installing all essential equipment necessary for GPRS network communication (modems, antennas, and accessories). Additionally, the supplier must personally subscribe to the service provider for the necessary subscriptions for a minimum duration of three years (the warranty period).

E9.3 The supplier must obtain, if necessary, the required authorizations from the competent national authorities for radio frequency regulation.

E9.4 The real-time data processed by the datalogger must be transmitted at a predefined frequency to a central server.

E9.5 Configure selective data transmission (choosing parameters to transmit and their transmission frequencies).

E9.6 The format of the output data from the data logger to be transmitted to the central system must be known and well documented.

10. Electrical Power Supply

E10.1 Power supply via a solar energy system: equipped with a reliable solar panel and a rechargeable battery system for continuous operation, especially in remote areas with limited access to electricity.

E10.2 Rechargeable battery: capable of providing uninterrupted power for at least 14 days during periods of low sunlight or adverse weather conditions.

E10.3 The system must also include a solar charge controller sized for solar panels of at least 50 watts.

11. Wiring and Connectors

E11.1 All cables used in the systems delivered by the supplier must comply with national standards, regulations, and codes.

E11.2 The cables between two terminals must be of uninterrupted length.

E11.3 The use of adhesive saddles is not allowed.

E11.4 Provisions may be made to protect cables from abrasion or external damage.

E11.5 All screws, nuts, and washers in the installation must be made of stainless steel or galvanized steel.

12. Instrument Park

E12.1 The bidder must provide a schematic diagram illustrating the layout of the instrument park, clearly indicating the position of each component of the automatic station, as well as the distances between each component and the fence, ensuring that no shadow affects the instruments.

E12.2 The contractor is required to construct the meteorological observation park and its fence to shelter the equipment of the automatic station to be provided and installed as part of this contract.

E12.3 The enclosure of the observation park must cover an area of at least 100 m² (10 m by 10 m).

E12.4 The instrument park must be surrounded by a rigid wire mesh fence 2 meters high. An access door, with a key lock and all necessary installation accessories, must be put in place.

E12.5 Metal poles (for joining and support) made of thermally coated galvanized steel, with uniform characteristics matching the wire mesh, including material, color, and dimensions. The poles will be spaced 2 to 2.5 meters apart, including the base for installation and all necessary accessories.

E12.6 The installation of equipment in the instrument park will require leveling the ground, constructing concrete platforms and bases, and laying slabs for the anemometer mast, guy wires, and sensor support structures. Additionally, walkway slabs must be installed to facilitate maintenance in rainy weather.

E12.7 Concrete platforms for the installation of masts and sensor support structures, such as the rain gauge, must be concrete foundations anchored in the ground and sufficiently dimensioned to ensure the stability of the mast and supports. They must include metal accessories for mast fixation, meeting the specific requirements outlined in the technical note provided by the manufacturer.

Article 4. Requirements for the Collection and Sharing of Metadata and Data

13. Collection and Sharing of Metadata

E13.1 The metadata for the automatic stations provided must be collected during installation. Once approved, the collected metadata will be entered into the WMO OSCAR/Surface web tool. For this purpose, the national meteorological service (ANM) will provide the WIGOS station identifier for each station to be supplied.

E13.2 Metadata will be collected following the template prepared for this purpose by the ANM.

Existing Data Concentration System of the ANM

- The National Meteorological Agency (ANM) currently has a central system for the concentration of data from existing automatic meteorological stations. This central system consists of hardware (a non-redundant server) and software from the Vaisala manufacturer.
- The operational software solution consists of a set of modules allowing:
 - Real-time and delayed data acquisition;
 - Programming of intervals and time slots for data acquisition;
 - Configuration of different acquisition modes (automatic, manual, normal, alert);
 - Data backup and archiving in a structured database;

- Programming of alert thresholds and visual and audible alarms;
- Generation of various types of operational status reports (daily, monthly, etc.) for interconnected systems (floods, alerts, station status, etc.).

14. Data Integration at the Central Level

The supplier must provide a turnkey solution that is compatible and integrable with the existing data concentration system installed at the ANM headquarters as described above. The supplier must ensure that data is transmitted directly from the primary data acquisition unit (datalogger) to the existing Vaisala system (data must be sent in an acceptable format as described in the Annex). Additionally, the supplier must ensure that remote control or configuration functions for the dataloggers can be performed from the existing central server.

If the proposed system cannot provide direct communication from the existing central server to the dataloggers and vice versa, the contractor must, at their own cost, provide a central concentration system that meets the following minimum requirements:

E14.1 The central system must consist of appropriate hardware and software for remote monitoring and control, remote configuration, administration, and updates.

E14.2 The central concentration system must also be able to communicate with each remote datalogger. Each datalogger will be connected to the central system's TCP/IP connection, and IP addresses will be used to identify each one.

E14.3 A bidirectional communication link must be established, and time synchronization between the central system and each datalogger must occur regularly.

E14.4 The software solution will be installed on a dedicated, reliable, and up-to-date server provided under this contract. If needed, the associated screen should have a minimum size of 26 inches.

E14.5 The software must allow encoding, automatic generation, and dissemination of WMO messages to an existing system. SYNOP reports must be prepared in accordance with WMO standards and provided in TAC and BUFR formats.

E14.6 The software must integrate security modules and user profile management tools.

E14.7 In addition to the central server, a dedicated, reliable, and up-to-date client workstation will also be provided under this contract. The associated screen must have a minimum size of 26 inches.

E14.8 The equipment will be supplied with an "IN-LINE" UPS system, with a nominal input/output voltage of 230 V at 50/60 Hz, adequate power capacity, and a minimum backup runtime of 10 minutes.

E14.9 The software solution must also allow the following functionalities:

- Real-time and delayed data acquisition;
- Programming of intervals and time slots for data acquisition;
- Configuration of different acquisition modes (automatic, manual, normal, alert);
- Data backup and archiving in a structured database;
- Programming of alert thresholds and visual and audible alarms;

- Generation of various types of operational status reports (daily, monthly, floods, alerts, station status, etc.) for interconnected systems;
- Sending data to the ANM climatological database.

E14.10 The database structure must be well documented.

Article 5. Requirements for Energy Sources and Protection

Power Supply Mode

E15.1 The automatic station will be powered by solar energy. The power supply system must include a rechargeable battery, a surge protection charge controller, and a solar panel.

E15.2 The solar power module must have a minimum autonomy of 20 days without sunlight.

E15.3 The power supply system must be able to control a proper shutdown of all components of the automatic station to conserve energy and allow automatic restart once the battery charge state permits.

E15.4 The supplier must clearly indicate the characteristics of the proposed batteries (charge/maintenance regime allowing minimum one-year operation without maintenance and provide the equivalent battery specifications to facilitate local supply).

Protection Against Surges

E15.5 The inputs and outputs of the automatic station must be protected against atmospheric or other surge sources by reliable electrical protection systems. These protections will be implemented at the external connection points and directly referenced to the site's grounding system.

E15.6 The modules of the automatic station must be installed in an equipotential grounding zone explicitly designed within the site infrastructure. To ensure equipotentiality, special attention must be given to the materials, including connections.

E15.7 For analog inputs, electrical protections must be selected in a way that does not affect signal characteristics and consequently alter the measurement accuracy.

Equipment Identification

E15.8 Each module or sub-assembly of the automatic station must be identified by a visible ownership label attached to the outside of the module's casing.

E15.9 The label must display the following text (in 3mm capital letters): "AGENCE NATIONALE DE LA METEOROLOGIE."

E15.10 The labels should be made of materials that are durable under normal usage conditions and engraved or marked indelibly with good color contrast. The supplier may display its brand or corporate name on a separate plaque of smaller size and less visible location, leaving priority for reading the Agency's plaque.

Article 6. Requirements for System Mastery

To enable the ANM to better operate the system being provided under this contract, the contractor must provide all the necessary documentation for the operation and maintenance of this system, guarantee a transfer of skills to enable mastery of the system, and ensure the system's maintenance during the warranty period.

Documentation

E16.1 The documentation must provide a detailed understanding of the operation of the equipment, covering both hardware and software aspects.

E16.2 The documentation must be provided in three copies and in electronic format.

E16.3 The documentation must be in French.

E16.4 The documentation must include the user manual for the datalogger software.

E16.5 In the case where a central data concentration solution is provided, the documentation must include a software section covering the following topics:

- Description of the architecture and principles of the software solution, including the database architecture.
- User manuals for the software solution. These manuals must be in French.
- Administration and maintenance guide for the software solution.
- Formulas and calculation principles for the parameters processed by the system.
- Backup/restoration procedures (in French).

The documentation must also contain a hardware section covering the following topics:

- Description of the procedures, operations, and frequency of preventive maintenance for all items provided under this contract.
- Troubleshooting document: tests and diagnostics to be carried out in the event of failure or anomalies, as well as corrective maintenance operations.
- Manuals or technical documents for the equipment (datalogger, sensors, servers, PCs, bay equipment, transmission solution, inverters, voltage regulators, etc.) installed under this contract.
- Description of calibration procedures.

Training and Skills Transfer

E16.6 The contractor must carry out training and skills transfer for both operational and maintenance staff as part of this contract.

E16.7 The training must enable participants to master the installations to ensure their operation and maintenance.

E16.8 The training must be organized in an appropriate environment that allows participants to conduct practical work and simulations for operation, maintenance, and administration of the client and server stations, if applicable.

E16.9 The training and course materials must be in French.

E16.10 Course materials must be provided to each participant in both paper and digital formats.

E16.11 Training will be organized for eight (8) ANM staff members and its partners, with a focus on software, administration, and system operation.

E16.12 The duration (minimum 5 days), program, and organization of this training must be included in the technical offer of the bidder.

E16.13 The goal of the training is to enable ANM staff to operate, administer, and maintain the system.

E16.14 Four types of training must be scheduled for this project:

- Training on the use of the proposed software for operations engineers,
- Factory training on system configuration for 2 instrument engineers,
- Training on equipment maintenance for 3 technicians,
- Training on the administration and maintenance of the proposed software for 2 IT specialists.

E16.15 The contractor will provide details on the modalities of these training sessions (program, schedule, location, CVs of the experts in charge...).

E16.16 A calibration and validation training session must be conducted on-site, focused on verifying and adjusting the readings of humidity, temperature, precipitation, and pressure using the calibration kits to be provided as part of this contract.

Article 7. Two-Year Warranty and Maintenance Operations

Warranty Requirements

E17.1 All equipment and software subject to this tender will be under warranty for a period of 3 years.

E17.2 During the warranty period, the contractor must keep the system operational and perform at least one annual preventive visit for all provided stations, instrument parks, and any central solution.

E17.3 The contractor will make a hotline available to the beneficiary, at least during working hours and days. The contractor will also provide remote monitoring of the system and correct any hardware and software anomalies that occur during this period.

E17.4 Remote intervention, particularly for the software solution, must be carried out within 24 hours of reporting the failure on the hotline.

E17.5 Defective parts must be sent within 4 weeks after notification for replacement.

E17.6 During the warranty period, the contractor commits to resolving any software anomalies or bugs and updating any hardware or software necessary for the proper functioning of the system.

E17.7 The contractor also agrees to update the system to comply with all official updates or modifications of meteorological codes and messages during the two-year warranty period.

Maintenance and Support

E17.8 Technical assistance: This includes access to technical support services for installation, calibration, and ongoing maintenance.

E17.9 Spare parts: The contractor is required to provide a set of spare parts, including at least:

- One copy of each sensor,
- One datalogger,
- One telecommunication modem,
- A set of cables.

E17.10 Field Calibration Kit: The contractor is required to provide two (02) sets of sensor kits for field calibration/verification with a measurement accuracy not lower than that of the calibrated sensor. The field calibration kit must include:

- A high-quality digital barometer (class A) and a humidity and temperature sensor with a display and performance better than the sensors provided with the automatic stations.
- The kit must be delivered in a robust and weather-resistant carrying case.
- An automated device for field calibration of tipping bucket rain gauges.

E17.11 Maintenance Laptop: A robust laptop (a recent model from a well-known brand) with a carrying case and all necessary software, cables, and drivers installed for on-site maintenance, intervention, and data extraction.

E17.12 Maintenance Toolbox: The contractor is required to provide two maintenance toolboxes, each with a minimum of 100 pieces for corrective and preventive main

Annex IV

UPPER AIR Station Equipment for the 1 site (including consumables for 3 years) – ASECNA type

Basic equipment	Number of Unit
Electrolytic generator type BPMP 500-7-EC	1
H2 storage tank – 1000 liters water capacity (7m3 H2)	1
COMPLETE DOUBLE OUTPUT DRAWING PANEL	1
Flame arrester and anti-detonation device	1
Lot of piping, fittings and fixing accessories for connection of diverse gas equipment	1
Recommended materials for installation	
H2 leak detection system equipped with 2 explosimeter sensors	1
Multi-protocol communication module allowing reception and management of alarms on Smartphone or PC.	1
Touch screen mounted on the front panel allowing visualization and control of generator operation and maintenance	1
Automatic balloon filling device	1
Others items (PC, consumables, solar energy system)	
Fixed PC station for data acquisition for management and recording of alarms and faults generated,	1
Totex / Balloons 350 g (quantity for 1 site for 3 years of operation)	2250
METEOMODEM SR10 radiosonde system (quantity for 1 site for 3 years of operation)	1
METEOMODEM M20 radiosondes with barometer (quantity for 1 sites for 3 years of operation)	2250
METEOMODEM parachutes for radiosondes (quantity for 1 sites for 3 years of operation)	2250
Solar system of at least 9KWp to power the generator	1
Water wells	1
Total others items	
Spare parts for Generator	
CONSOMMABLES POUR 3 ANS DE FONCTIONNEMENT POUR GENERATEUR	1
[PIECES DE RECHANGES POUR 3 ANS DE FONCTIONNEMENT POUR GENERATEUR	1
Additional services	
Site technical assistance package for installation, commissioning and specific site training on safety, use and periodic monitoring of the generator	1
Contingency	3

Report completion signatures

Peer Advisor signature

Andreas Schöffhauser 

Beneficiary Country signature



WMO Technical Authority signature

