September 2023

GBON National Gap Analysis

Systematic Observations
Financing Facility

**Weather
and climate
data for
resilience**

Screening of the National Gap Analysis (NGA) of Madagascar

WMO Technical Authority screens the GBON National Gap Analysis to ensure consistency with the GBON regulations and provides feedback for revisions as needed. *The screening of the NGA is conducted according to the SOFF Operational Guidance Handbook, version: 04.07.2023 and the provisions in Decision 5.7 of the SOFF Steering Committee.*

Following iterations with the peer advisor and beneficiary country, WMO Technical Authority confirms that the National Gap Analysis is consistent with GBON regulations.

Date: 15 May 2024

Signature:

Albert Fischer

Director, WIGOS Branch, Infrastructure Department, WMO

GBON National Gap Analysis Report
Madagascar

Beneficiary Country Focal Point and Institute	Dr. Nirivololona Raholijao, DGM
Peer Advisor Focal Point and Institute	Dr. Carmen Emmel, DWD

1. Country information from the GBON Global Gap Analysis

Please provide in this Table the country information as provided by the WMO Global GBON Gap Analysis.

Table I. WMO GBON Gap Analysis (June 2023). Illustration of the information that the WMO Secretariat provides to each country

A. GBON horizontal resolution requirements	B. Target	C. Reporting to req. [1]	D. Gap to improve	E. Gap new	F. Gap total
Surface stations Standard density[2] 200 km	15	4	11	0	11
Upper-air stations over land Standard density[2] 500km	3	0	2	1	3

---

[1] The rationale for classifying surface and upper-air stations as reporting is based on the WIGOS Data Quality Monitoring System (WDQMS) for the chosen time period (WMO GBON Global Gap analysis, January 2022) . Stations that were either green (GBON compliant), or orange ("potentially GBON compliant") on at least 60% of days, are considered as reporting. Other listed stations are counted as having the possibility to be improved.

[2] For SIDS, for the WMO GBON Global Gap Analysis in January 2022, the EEZ area has been added to the total surface area which is the basis for the target number of stations. The standard density requirements for SIDS have been calculated with 500 km for surface stations and 1000 km for upper-air stations.

2. Analysis of existing GBON stations and their status against GBON requirements

Please complete the two tables below and add remarks and Annexes with technical details as needed.

Table II. Assessment of existent stations per their operational status and network ownership

| GBON Requirements | Existing observation stations (# of stations) | | | |
| | NMHS network | | Third-party network | |
	Reporting to req. [3]	To improve	Reporting to req. [21]	To improve
Surface land stations Standard density [4] 200km Variables: SLP, T, H, W, P, SD	0	9	4	0
Upper-air stations operated from land Horizontal resolution[4]: 500km Vertical resolution: 100m, up to 30 hPa Variables: T, H, W	0	0	2	0
Surface marine stations in Exclusive Economic Zones:[7] 500 km Variables: SLP, SST				
Upper-air stations operated in Exclusive Economic Zones:[5] 1000 km Vertical resolution: 100 m, up to 30 hPa Variables: T, H, W				

---

[3] The rationale for classifying surface and upper-air stations as reporting is based on the WIGOS Data Quality Monitoring System (WDQMS) for the chosen time period (WMO GBON Global Gap analysis, January 2022) . Stations that were either green (GBON compliant), or orange ("potentially GBON compliant") on at least 60% of days, are considered as reporting. Other listed stations are counted as having the possibility to be improved.

[4] For SIDS, for the WMO GBON Global Gap Analysis in January 2022, the EEZ area has been added to the total surface area which is the basis for the target number of stations. The standard density requirements for SIDS have been calculated with 500 km for surface stations and 1000 km for upper-air stations.

[5] Although GBON marine stations and stations in EEZ are not part of initial SOFF scope, peer advisors are encouraged to analyse in this step when considered relevant e.g. SIDS, the status of current marine stations for future GBON marine observations investments.

Table III. Assessment of existing GBON stations per station characteristics. Station type: S: Surface, UA: Upper-Air; M: Marine; Owner of the station: NMHS or name of third-party; GBON variables: SLP: Atmospheric pressure; T: Temperature; H: Humidity; W: wind; P: Precipitation; SD: Snow depth; SST: Sea surface temperature; Reporting cycle: Number of observation reports exchanged internationally per day (0-24); GBON compliance: weather the station is GBON compliant or not (see GBON guide on compliance criteria).

Station name	Station type (S/UA/M[6])	Owner (NMHS/3rd party)	Funding source	GBON variable measured							Reporting cycle (obs/day)	GBON Compliant (Y/N)
				SLP	T	H	W	P	SD	SST		
Taolagnaro, automated (Degreane)	S	3rd party	ASECNA	x	x	x	x	x	-	-	24	Y
Toamasina, automated (Degreane)	S	3rd party	ASECNA	x	x	x	x	x	-	-	24	Y
Ivato, automated (Degreane)	S	3rd party	ASECNA	x	x	x	x	x	-	-	24	Y
Mahajanga, automated (Degreane)	S	3rd party	ASECNA	x	x	x	x	x	-	-	24	Y
Ivato	UA	3rd party	ASECNA		x	x	x				2	Y
Taolagnaro	UA	3rd party	ASECNA		x	x	x				2	Y

---

[6] Please see guidance on marine stations in Section 2 on Scope.

3. Results of the GBON National Gap Analysis

Please complete the two tables below and add remarks and technical details in Annexes as needed.

Table IV. Results of the GBON national gap analysis. SLP: Atmospheric pressure; T: Temperature; H: Humidity; W: wind; P: Precipitation; SD: Snow depth; SST: Sea surface temperature.

GBON requirements	GBON target (# of stations)	GBON Compliant stations (#)	Stations gap	
			To improve	New
Surface land stations Standard density[7] 200km Variables: SLP, T, H, W, SD Observing cycle: 1h	15	4	9	2
Upper-air stations operated from land Standard density[7] 500km Vertical resolution: 100m, up to 30 hpa Variables: T, H, W Observing cycle: twice a day	3	2	0	1
Surface marine stations in Exclusive Economic Zones:[8] Density 500 km Variables: SLP, SST Observing cycle: 1h				
Upper-air stations operated in Exclusive Economic Zones: [9] Density 1000 km Vertical resolution: 100 m, up to 30 hPa Variables: T, H, W Observing cycle: twice a day				

---

[7] For SIDS, for the WMO GBON Global Gap Analysis in January 2022, the EEZ area has been added to the total surface area which is the basis for the target number of stations. The standard density requirements for SIDS have been calculated with 500 km for surface stations and 1000 km for upper-air stations.

[8] Although GBON marine stations are not part of initial SOFF scope, peer advisors are encouraged to analyse in this step when considered relevant e.g. SIDS, the need for future GBON marine observations investments according to the GBON requirements.

[9] Although GBON marine stations are not part of initial SOFF scope, peer advisors are encouraged to analyse in this step when considered relevant e.g. SIDS, the need for future GBON marine observations investments according to the GBON requirements.

3.1 Recommended existing surface, upper-air and marine[11] stations to be designated to GBON

Table V. Recommended existing surface, upper-air and marine stations to be designated to GBON.

Station name	Station type (S/UA/M[12])
Taolagnaro, automated (Degreane)	S
Toamasina, automated (Degreane)	S
Ivato, automated (Degreane)	S
Mahajanga, automated (Degreane)	S
Ivato	UA
Taolagnaro	UA

---

[10] Although GBON marine stations are not part of initial SOFF scope, peer advisors are encouraged to analyse in this step when considered relevant e.g., SIDS, the need for future GBON marine observations investments according to the GBON requirements.
[11] Although GBON marine stations are not part of initial SOFF scope, peer advisors are encouraged to analyse in this step when considered relevant e.g., SIDS, the need for future GBON marine observations investments according to the GBON requirements.
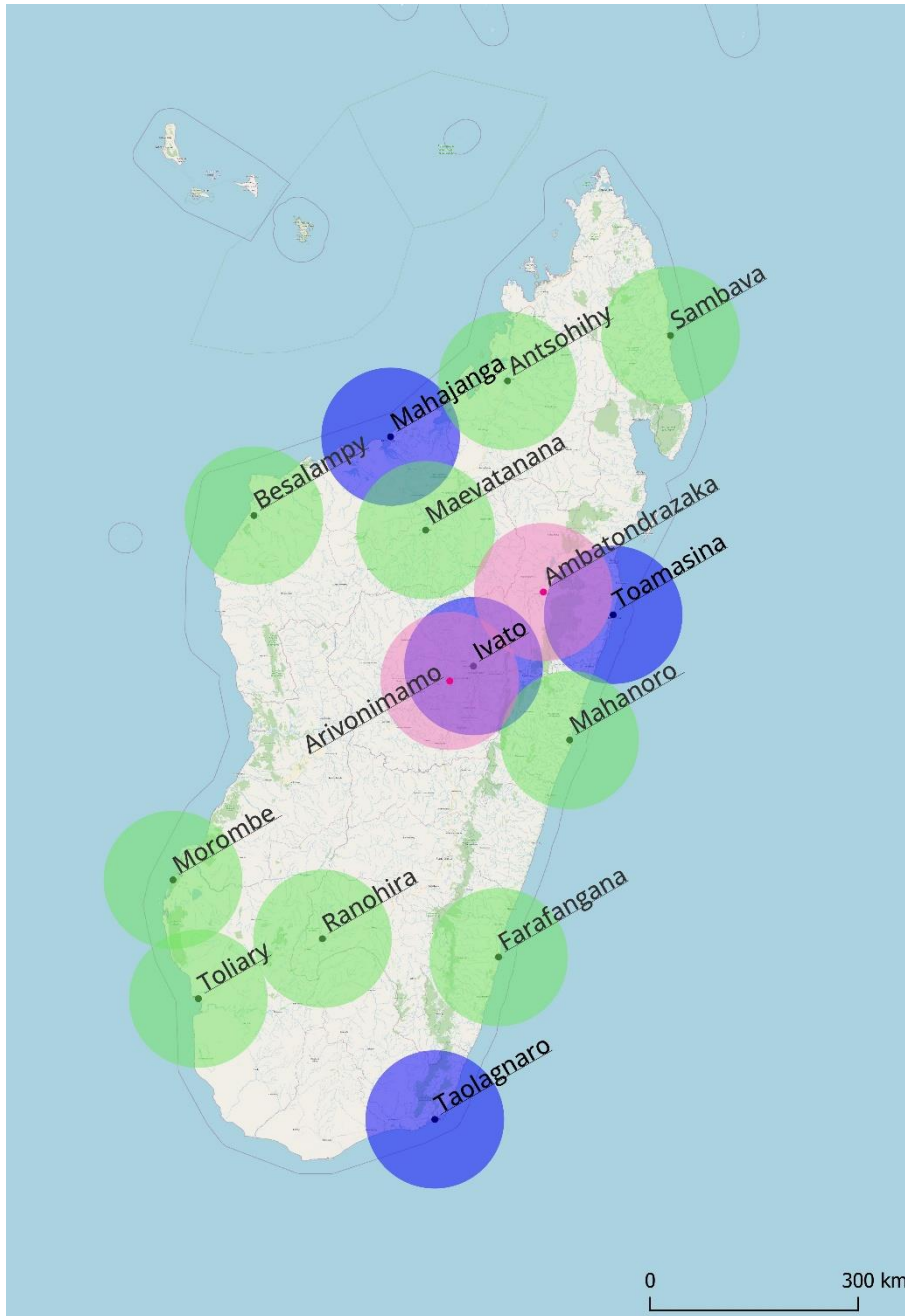[12] Please see guidance on marine stations in Section 2 on Scope.

Figure 1: Map of surface stations (blue: GBON compliant stations, green: proposed stations to be improved (draft), pink: newly proposed sites (draft; region around the capital/Ivato airport has a high population density and relatively good infrastructure. New stations in this area improve maintenance possibilities and early warning for a large proportion of the population); circles cover a 100 km radius around the stations)
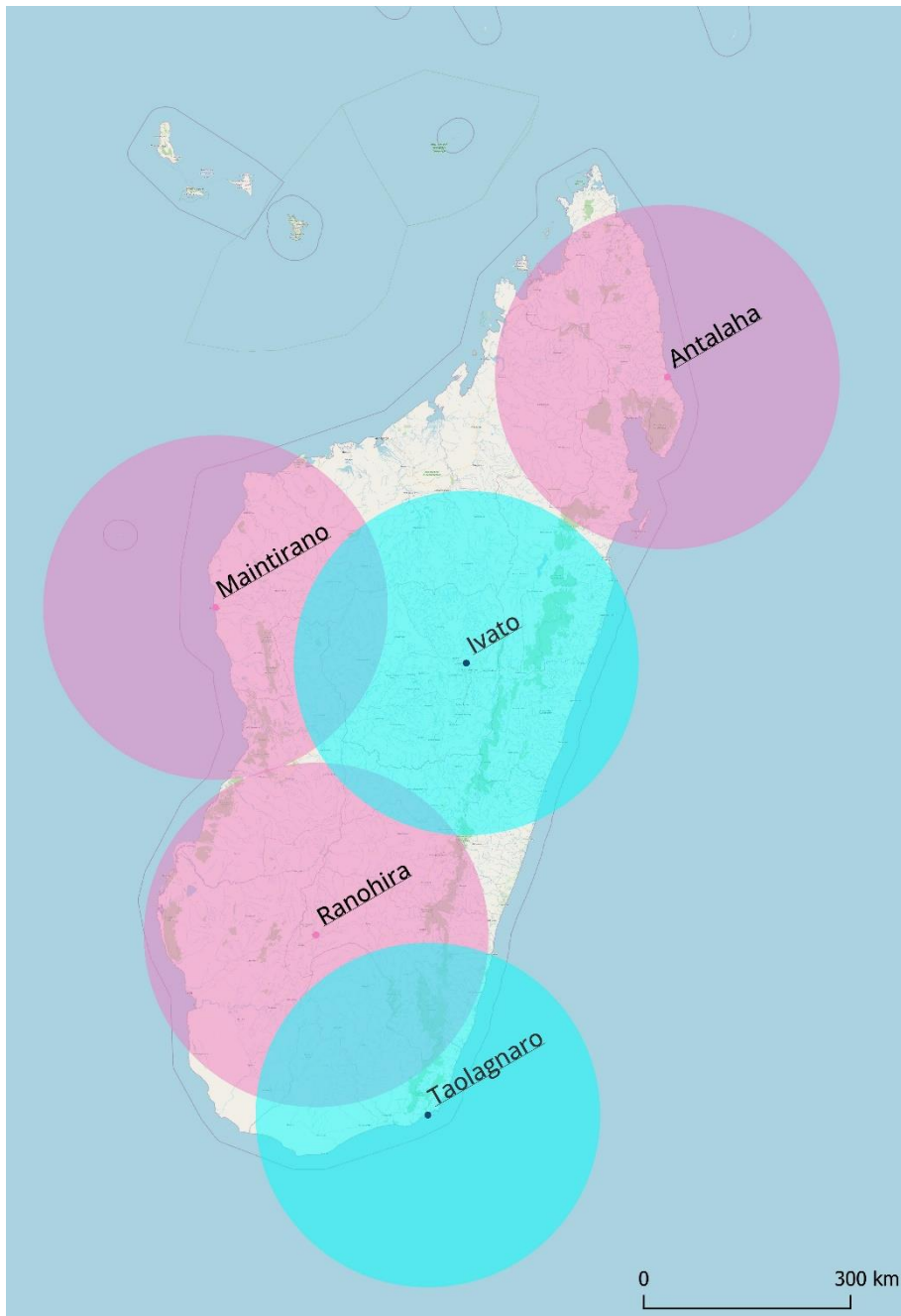
Figure 2: Map of upper air stations (blue: GBON compliant stations, pink: newly proposed sites (one out of the three will be chosen); circles cover a 250 km radius around the stations)

4. Report completion signatures

Peer Advisor signature

WMO Technical Authority screening signature

Beneficiary Country signature

LE DIRECTEUR GÉNÉRAL
DE LA METEOROLOGIE

Rivololona RAHOLIJAO
Docteur Ingénieur et Mvtéorologie
Ingénieur en Chef de Classe Exceptionnelle