



21-07-2023

GBON National Gap Analysis

Systematic Observations
Financing Facility

**Weather
and climate
data for
resilience**





Screening of the National Gap Analysis (NGA) of Mozambique

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.

While the WMO GBON Global Gap Analysis identified the need for 20 GBON surface land and 4 upper air stations, the **WMO Technical Authority confirms the NGA which indicates the need for 21 surface land and 4 upper air stations to ensure adequate horizontal resolution for GBON.**

Date: 5th Oct 2023

Signature:

Albert Fischer

Director, WIGOS Branch, Infrastructure Department, WMO

Mozambique GBON Gap Analysis Report

Beneficiary Country Focal Point	Aderito Celso Felix Aramuge (Instituto Nacional de Meteorologia)
Peer Advisor Focal Point and Institute	Francis Moseelho, South African Weather Service
WMO Technical Authority	

1. Country GBON horizontal resolution requirements

The number of required GBON stations in the table below is based on the global gap analysis results received from the WMO Secretariat.

A. GBON horizontal resolution requirements	B. GBON target (# of stations)	C. Reporting (as per WDQMS)	D. Gap improve	E. Gap new	F. Gap total
SURFACE STATIONS Horizontal resolution: 200km	20	0	20	0	20
UPPER-AIR STATIONS Horizontal resolution: 500km	4	0	0	4	4

Table 1: WMO GBON Global Gap Analysis (June 2023)

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

The Mozambique National Institute of Meteorology (INAM) operates and maintains 106 Automatic Weather Stations (AWS) deployed nationally as well as 46 manual climate stations. 43 of these AWS are operational but only 14 of these systems transmit data through to the GTS. 21 of these land surface stations could potentially be included in the national GBON network. An additional station will be affiliated to GBON to close the gap in the southeastern part of the country. Ten of the 21 stations are funded by the World Bank (WB), Food and Agriculture Organization (FAO), Nordic Development Fund (NDF), African Development Bank (BAD), (United Nations Development Programme (UNDP) respectively.

. GBON Requirements	Existing observation stations (# of stations)			
	NMHS network		3rd party network	
	Reporting	Improve	Reporting	Improve
SURFACE STATIONS Horizontal resolution: 200km Variables: SLP, T, H, W, P, SD	14	21	0	0
UPPER-AIR STATIONS Horizontal resolution: 500km Vertical resolution: 100m, up to 30 hPa Variables: T, H, W	0	4	0	0

Table 2: Assessment of existent stations per their operational status and network ownership

GBON, MOZAMBIQUE (INAM)

Station name	Station type (S/UA)	Owner (NMHS/3 rd party)	Funding source	Assembly year	Manual operated /AWS	Status	GBON variable measured						Gap New/ Improve	
							SLP	T	H	W	P	SD		Reporting
BEIRA	UA	NMHS				Planned								New
MAPUTO INAM_HQ	UA	NMHS				Planned								New
NAMPULA	UA	NMHS				Planned								New
TETE	UA	NMHS				Planned								New
BEIRA	S	NMHS	WB	2018	AWS	Operational	x	x	x	x			Yes	Improve
CAIA	S	NMHS	WB	2019	AWS	Operational	x	x	x	x			Yes	Improve
CATANDICA	S	NMHS	FAO	2023	AWS	Operational	x	x	x	x			Yes	Improve
CHANGALANE	S	NMHS	FAO	2022	AWS	Operational	x	x	x	x			Yes	Improve
CHICUALACUALA_AUTO	S	NMHS	FAO	2022	AWS	Operational	x	x	x	x			No	Improve
CUAMBA	S	NMHS	WB	2019	AWS	Operational	x	x	x	x			Yes	Improve
Dindiza	S	NMHS	WB	2019	AWS	Operational	x	x	x	x			Yes	Improve
ESPUNGABERA	S	NMHS	FAO	2023	AWS	Operational	x	x	x	x			Yes	Improve
Furancungo	S	NMHS	FAO	2023	AWS	Operational	x	x	x	x			Yes	Improve
INHAMBANE	S	NMHS	NDF	2021	AWS	Operational	x	x	x	x			Yes	Improve
LICHINGA	S	NMHS	WB	2019	AWS	Operational	x	x	x	x			Yes	Improve
MAPULANGUENE	S	NMHS	SADC	2020	AWS	Operational	x	x	x	x			Yes	Improve
MARRUPA	S	NMHS	WB	2019	AWS	Non-Operational	x	x	x	x			Yes	Improve
MILANGE	S	NMHS	BAD	2022	AWS	Operational	x	x	x	x			Yes	Improve
MUEDA	S	NMHS	FAO	2023	AWS	Operational	x	x	x	x			Yes	Improve
NAMPULA	S	NMHS	WB	2019	AWS	Operational	x	x	x	x			Yes	Improve
PEMBA	S	NMHS	UNDP	2015	AWS	Operational	x	x	x	x			Yes	Improve
TETE	S	NMHS		2016	Manual	Operational	x	x	x	x			Yes	Improve
VILANCULOS	S	NMHS	NDF	2021	AWS	Operational	x	x	x	x			Yes	Improve
ZUMBO	S	NMHS	WB	2019	AWS	Operational	x	x	x	x			Yes	Improve
MULEVALA_AUTO	S	NMHS	INAM	2023	AWS	Operational	x	x	x	x			No	Improve

Table 3. Assessment of existent stations per their operational status and network ownership

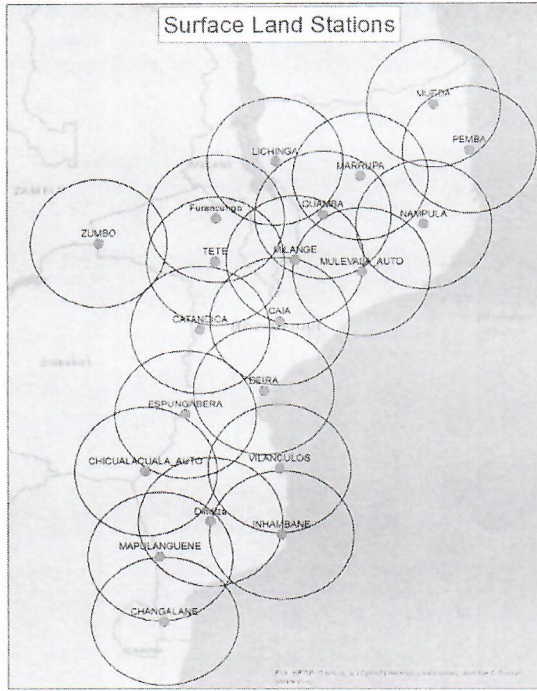
GBON, MOZAMBIQUE (INAM)

Station name	Station type (S/UA)	Reporting cycle (#observations per day)	GBON Compliance (Y/N)		Gap New/Improve	Improvement required									
			Variables	Reporting hourly		WIS-GTS Bulletins to be updated for hourly data exchange/ issues with the data transmission system	Occasional data outages/reports not as often as required	Non-reporting 0% data availability	The station is out of service /Non-operational	The station has broken instruments	The AWOS needs to be configured for hourly synoptic observations/Alternative station to be deployed at site				
BEIRA	UA				New										
MAPUTO INAM_HQ	UA				New										
NAMPULA	UA				New										
TETE	UA				New										
BEIRA	S	8	Y	N	Improve		✓								
CAIA	S	5	Y	N	Improve		✓								
CATANDICA	S	5	Y	N	Improve		✓								
CHANGALANE	S	5	Y	N	Improve		✓								
CHICUALACUALA_AUTO	S	0	Y	N	Improve		✓								
CUAMBA	S	5	Y	N	Improve		✓								
Dindiza	S	5	Y	N	Improve		✓								
ESPUNGABERA	S	5	Y	N	Improve		✓								
Furancungo	S	5	Y	N	Improve		✓								
INFAMBANE	S	8	Y	N	Improve		✓								
LICHINGA	S	8	Y	N	Improve		✓								
MAPULANGUENE	S	5	Y	N	Improve		✓								✓
MARRUPA	S	5	Y	N	Improve		✓						✓		
MILANGE	S	5	Y	N	Improve		✓								
MUEDA	S	5	Y	N	Improve		✓								
NAMPULA	S	8	Y	N	Improve		✓								✓
PEMBA	S	7	Y	N	Improve		✓								
TETE	S	7	Y	N	Improve		✓								✓
VILANCULOS	S	5	Y	N	Improve		✓								
ZUMBO	S	5	Y	N	Improve		✓								
MULEVALA_AUTO	S	0	Y	N	Improve		✓								
Total							21	8	4	1				3	

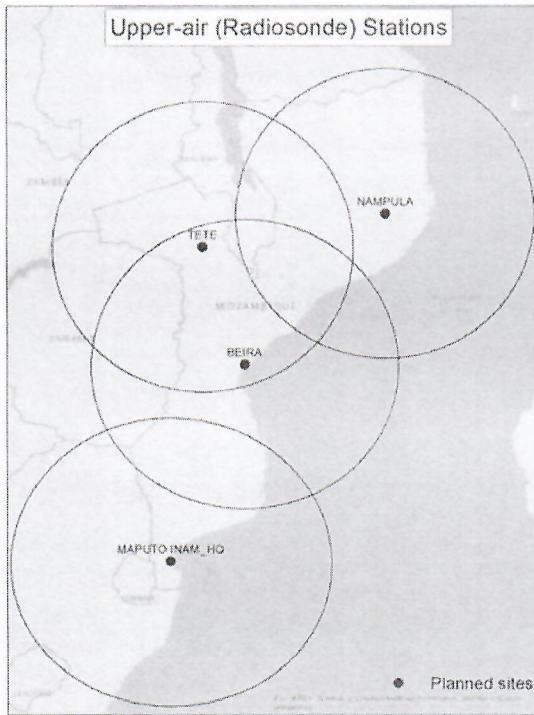
Table 4: Assessment of existing GBON stations per station characteristics

Handwritten signature

GBON, MOZAMBIQUE (INAM)



Map of the surface stations



Map of the upper air stations

GBON, MOZAMBIQUE (INAM)

3. Results of the GBON Gap Analysis

The outcome of stations needed to install or rehabilitate and provide a map of existing stations with the location of gaps indicated in circles of 200km (surface) and 500km (upper-air) radius.

GBON requirements	GBON target (#of stations)	Compliant stations with GBON requirements (# of stations)	Stations needed against GBON requirement	
			New	Improved
SURFACE STATIONS <ul style="list-style-type: none"> Horizontal resolution: 200km Variables: SLP, T, H, W, SD Observation cycle: 1h 	21	0	0	21
UPPER-AIR STATIONS <ul style="list-style-type: none"> Horizontal resolution: 500km Vertical resolution: 100m, up to 30 hpa Variables: T, H, W Reporting cycle: twice a day 	4	0	4	0

Table 5: Results of the GBON Gap Analysis

Station name	Station type (S/UA)	Registered in OSCAR/Surface	Affiliated to GBON
BEIRA	UA	Yes	Yes
MAPUTO INAM_HQ	UA	Yes	Yes
NAMPULA	UA	Yes	Yes
TETE	UA	Yes	Yes
BEIRA	S	Yes	Yes
CAIA	S	Yes	Yes
CATANDICA	S	Yes	Yes
CHANGALANE	S	Yes	Yes
CHICUALACUALA_AUTO	S	Yes	Yes
CUAMBA	S	Yes	Yes
Dindiza	S	Yes	Yes
ESPUNGABERA	S	Yes	Yes
Furancungo	S	Yes	Yes
INHAMBANE	S	Yes	Yes
LICHINGA	S	Yes	Yes
MAPULANGUENE	S	Yes	Yes
MARRUPA	S	Yes	Yes
MILANGE	S	Yes	Yes
MUEDA	S	Yes	Yes
NAMPULA	S	Yes	Yes
PEMBA	S	Yes	Yes
TETE	S	Yes	Yes
VILANCULOS	S	Yes	Yes
ZUMBO	S	Yes	Yes
MULEVALA_AUTO	S	Yes	Yes

Table 6: Designation of existing stations to GBON

GBON, MOZAMBIQUE (INAM)

1. Report completion signatures

<p>Peer Advisor Mr Ishaam Abader</p> <p>DocuSigned by: <i>Mr Ishaam Abader</i> 86EAA2275F1C4CB Date 20/7/2023 3:38 PM SAST</p>
<p>Beneficiary Country</p> <p><i>Adelto Aravugo</i></p> <p>Date <i>21.07-2023</i></p>
<p>WMO Technical Authority screening remarks and signature</p> <p><i>Alh Affial</i></p> <p>Date 05.10.2023</p>