31 January 2025

GBON National Gap Analysis

Systematic Observations
Financing Facility

**Weather
and climate
data for
resilience**

Screening of the National Gap Analysis (NGA) of Niger

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: 06/02/2025

Signature:

Albert Fischer

Director, WIGOS Branch, Infrastructure Department, WMO

GBON National Gap Analysis Report
Niger Republic

Beneficiary Country Focal Point and Institute	Saadou Moussa/Directorate of National Meteorology (DNM)
Peer Advisor Focal Point and Institute	Idowu Oluwaseun Wilfred/ Nigerian Meteorological Agency (NiMet)

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 Global 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 (GBON compliant)[1]	D. Gap to improve	E. Gap new	F. Gap total
	[# of stations]				
Surface stations Standard density[2] 200 km	32	0	31	1	32
Upper-air stations over land Standard density[2] 500km	6	1	1	4	5

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[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, June 2023). Stations with data availability more than 80% on at least 80% 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 June 2023, 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 (GBON compliant) [3]	To improve	Reporting (GBON compliant) [3]	To improve
Surface land stations Standard density [4] 200km Variables: SLP, T, H, W, P, SD	0	40	1	14
Upper-air stations operated from land Horizontal resolution[4]: 500km Vertical resolution: 100m, up to 30 hPa Variables: T, H, W	0	0	1	1
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: 100m, up to 30 hPa Variables: T, H, W				

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[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 during the development of National Gap Analysis Stations with data availability more than 80% on at least 80% 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 June 2023, 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 analyze 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: whether the station is GBON compliant or not (see GBON guide on compliance criteria).

Station name	Station type (S/UA/M)	Owner (NMHS/3rd party)	Funding source	GBON variable measured							Reporting cycle (obs/day)	GBON Compliant (Y/N)
				SLP	T	H	W	P	SD	SST		
Bilma	S	DMN & AANN		✓	✓	✓	✓	✓				No
Tillabéri	S	DMN & AANN		✓	✓	✓	✓	✓				No
Tahoua Aero	S	DMN & AANN		✓	✓	✓	✓	✓				No
Gouré	S	DMN & AANN		✓	✓	✓	✓	✓				No
N'Guigmi	S	DMN & AANN		✓	✓	✓	✓	✓				No
Dosso	S	DMN & AANN		✓	✓	✓	✓	✓				No
Birni Nkonni	S	DMN & AANN		✓	✓	✓	✓	✓				No
Maradi Aero	S	DMN & AANN		✓	✓	✓	✓	✓				No
Diffa	S	DMN & AANN		✓	✓	✓	✓	✓				No
Magaria	S	DMN & AANN		✓	✓	✓	✓	✓				No
Mainé-Soroa	S	DMN & AANN		✓	✓	✓	✓	✓				No
Gaya	S	DMN & AANN		✓	✓	✓	✓	✓				No
Niamey-Aero	S/UA	DMN & ASECNA		✓	✓	✓	✓	✓				Yes
Agadez-Aéro	S/UA	DMN & ASECNA		✓	✓	✓	✓	✓				No
Zinder-Aéro	S/UA	DMN & ASECNA		✓	✓	✓	✓	✓				No
Tibiri	S	DMN & Commune		✓	✓	✓	✓	✓				No
Dakoro	S	DMN		✓	✓	✓	✓	✓				No
Tessaoua	S	DMN		✓	✓	✓	✓	✓				No
Wacha	S	DMN & Commune		✓	✓	✓	✓	✓				No
Goudoumaria	S	DMN		✓	✓	✓	✓	✓				No
Keita	S	DMN		✓	✓	✓	✓	✓				No
Madaoua	S	DMN		✓	✓	✓	✓	✓				No
Tera	S	DMN		✓	✓	✓	✓	✓				No

Chikal	S	DMN		✓	✓	✓	✓	✓				No
Dogondoutchi	S	DMN		✓	✓	✓	✓	✓				No
Tapoa	S	DMN		✓	✓	✓	✓	✓				No
Dogo	S	DMN & Commune		✓	✓	✓	✓	✓				No
Doguéraoua	S	DMN & Commune		✓	✓	✓	✓	✓				No
Dan kassari	S	DMN & Commune		✓	✓	✓	✓	✓				No
Bangui	S	DMN & Commune		✓	✓	✓	✓	✓				No
Alléla	S	DMN & Commune		✓	✓	✓	✓	✓				No
Harikanassou	S	DMN & Commune		✓	✓	✓	✓	✓				No
Gothèye	S	DMN & Commune		✓	✓	✓	✓	✓				No
Kouré	S	DMN & Commune		✓	✓	✓	✓	✓				No
Kiota	S	DMN & Commune		✓	✓	✓	✓	✓				No
Fabidji	S	DMN & Commune		✓	✓	✓	✓	✓				No
Mokko	S	DMN & Commune		✓	✓	✓	✓	✓				No
Tessa	S	DMN & Commune		✓	✓	✓	✓	✓				No
Ouro- Guelado	S	DMN & Commune		✓	✓	✓	✓	✓				No
Kirtachi	S	DMN & Commune		✓	✓	✓	✓	✓				No
Koré Mairoua	S	DMN & Commune		✓	✓	✓	✓	✓				No
Tsernaoua	S	DMN & Commune		✓	✓	✓	✓	✓				No
Soucoucoutane	S	DMN & Commune		✓	✓	✓	✓	✓				No
Badaguichiri	S	DMN & Commune		✓	✓	✓	✓	✓				No
Galma	S	DMN & Commune		✓	✓	✓	✓	✓				No
Guidan-sori	S	DMN & Commune		✓	✓	✓	✓	✓				No
Sae-saboua	S	DMN & Commune		✓	✓	✓	✓	✓				No
Dan Issa	S	DMN & Commune		✓	✓	✓	✓	✓				No
Chadakori	S	DMN & Commune		✓	✓	✓	✓	✓				No
Gabi	S	DMN & Commune		✓	✓	✓	✓	✓				No
Kwaya/K.Baka	S	DMN & Commune		✓	✓	✓	✓	✓				No
S.Broum	S	DMN & Commune		✓	✓	✓	✓	✓				No
Yékoua	S	DMN & Commune		✓	✓	✓	✓	✓				No
Doungou	S	DMN & Commune		✓	✓	✓	✓	✓				No
Niamey Ville	S	DMN		✓	✓	✓	✓	✓				No

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	Global GBON target	Approved national target	Reporting	Gap To improve	Gap New
			[# of stations]		
Surface land stations	32	32	1	14	17
Upper-air stations operated from land	6	6	1	1	4
Surface marine stations in Exclusive Economic Zones:[6] Density 500 km Variables: SLP, SST Observing cycle: 1h					
Upper-air stations operated in Exclusive Economic Zones:[7] Density 1000 km Vertical resolution: 100 m, up to 30 hPa Variables: T, H, W Observing cycle: twice a day					

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[6] Although GBON marine stations are not part of initial SOFF scope, peer advisors are encouraged to analyze in this step when considered relevant e.g. SIDS, the need for future GBON marine observations investments according to the GBON requirements.
[7] Although GBON marine stations are not part of initial SOFF scope, peer advisors are encouraged to analyze 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[9] 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)
Agadez Aero	S/UA
Bilma	S/UA
Birni NKonni	S
Chikal	S
Dakoro	S
Diffa	S/UA
Gaya	S
Goure	S
Ingall	S
Maradi Aero	S
NGuigmi	S
Tahoua Aero	S/UA
Tillabery	S
Zinder Aero	S/UA
Niamey Aero	S/UA

Table VI. Recommended proposed surface, upper-air and marine stations to be designated to GBON.

Station name	Station type (S/UA/M)
Agadem	S
Lissia Boukar	S
Aguessis	S
Kandil Bozou	S
Bela Yala	S
Taggafadi	S
Aguando	S
Oubandawaki Makiani	S
Afassa	S

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

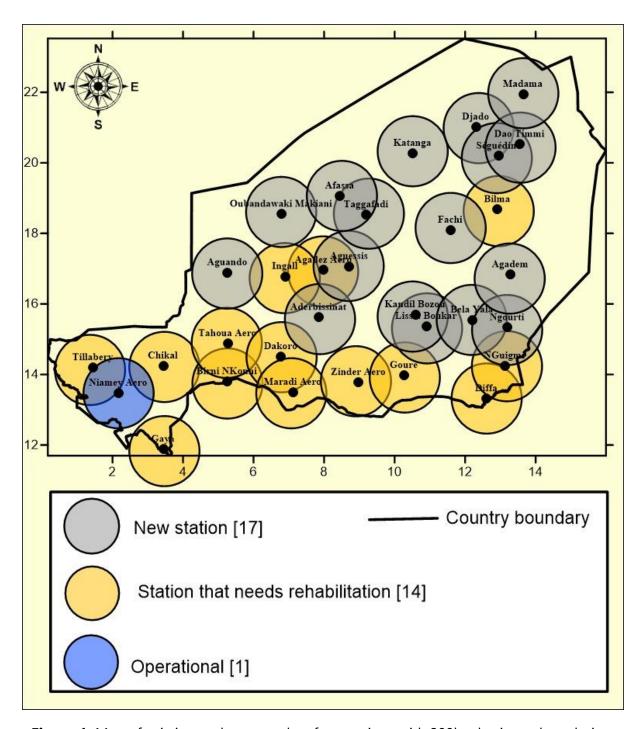|	
Fachi	S
Djado	S
Séguédine	S
Dao Timmi	S
Katanga	S
Madama	S
Ngourti	S
Aderbissinat	S
Zinder Aero	UA
Diffa	UA
Bilma	UA
Tahoua Aero	UA

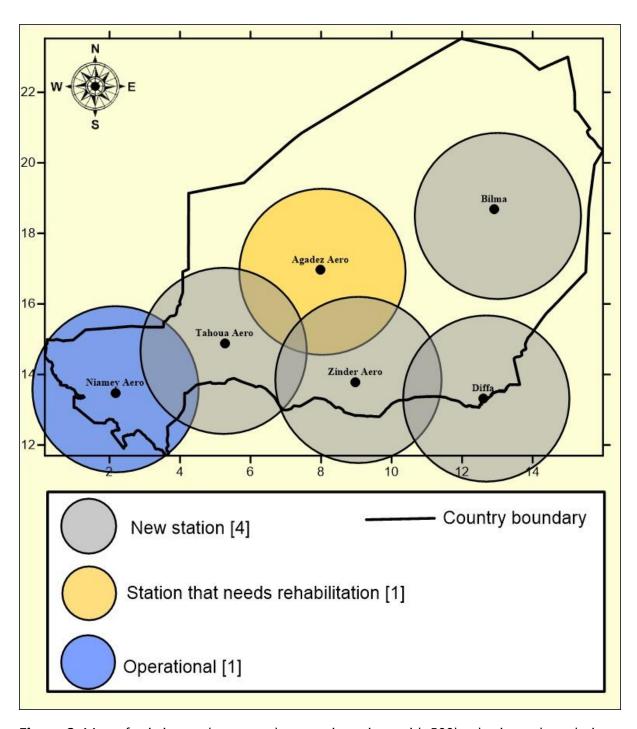**Figure 1:** Map of existing and proposed surface stations with 200km horizontal resolution.

Figure 2: Map of existing and proposed upper air stations with 500km horizontal resolution.

4. Report completion signatures

Peer Advisor Signature
Beneficiary Country Signature
WMO Technical Authority Screening Signature

ANNEXURE

List of stations visited for physical assessment during the in-country visit to Niger. NiMet's team visited these stations in the company of a DNM staff from Niamey. The team covered over 2000km distance from Niamey to Zinder, in 4 days, inspecting about 15 stations along the way.

S/N	Name of Station	Current Status	Challenges
1	**Dosso**	• A manned station belonging to DNM but operated by ASECNA through its local subsidiary; AANN. • A staff strength of just two (2) personnel. • The station has manual and automatic instruments including one SIAP + MICROS AWS. • GBON parameters and other weather parameters are measured at the station. • It is powered by public means as well as a solar inverter as a backup power supply. • Only manual observations are currently being transmitted on a three-hour basis.	• Inadequate staff strength to maintain 24/7 observations and data transmissions. • Poor internet connectivity is hindering the prompt and regular transmission of data observations to the collection centre in Niamey for upward transmission to the global centres. • The AWS is not configured to transmit coded synop messages. • No resident technician to carry out regular and routine maintenance.
2	**Dogondotchi**	• It is a manned station owned and operated by DNM. • The Stevenson screen is dilapidated and needs replacement. • A SIAP + MICROS AWS is installed at the station. • GBON parameters and other weather parameters are measured at the station.	• Inadequate staff strength to maintain 24/7 observations and data transmissions. • No resident technician to carry out regular and routine maintenance. • The AWS is not configured to transmit coded synop messages.

		- The station lacks maintenance. - Only one auxiliary staff is currently posted at the station. A DNM staff (observer) previously at the station is presently on training at the RTC in Nigeria - The current location of the station is too close to a main road. DNM said it could be moved further inside, with support, since there is enough land space for that at the compound. - No international data exchange from this station.	- No nearby source of water for the cleaning of some instruments (e.g. Class-A Pan for evapotranspiration) that are often covered in dust during dry seasons and dust storms. - The station needs to be relocated further inside from its current position.
3	**Dan Kassari**	- The DNM owns the station in collaboration with the host community. - The community secretary has been trained to carry out minor station maintenance. - The station is fully automatic with a SIAP + MICROS AWS installed. - GBON parameters and other weather parameters are measured at the station. - No international data exchange from this station.	- The station is located inside a temporary military base. DNM is positive that the military will move out soon. - There is a need to expand the size of the enclosure and upgrade it for international data exchange. - The AWS is not configured to transmit coded synop messages.
4	**Birnin Konni**	- A manned station belonging to DNM but operated by ASECNA through its local subsidiary; AANN. - A staff strength of just three (3) personnel. - The station has both manual and automatic instruments including one SIAP + MICROS AWS.	- The station is under-staffed and cannot adequately perform 24/7 observations and data transmission - The AWS is not configured to transmit coded synop messages.

		• GBON parameters and other weather parameters are measured at the station. • The station previously had an upper air station, but it is no longer operational. • The station is registered for international data exchange, but it is currently transmitting every three hours to WDQMS.	• Internet challenges regular data transmission from the station.
5	**Tsernaoua**	• An AgroMet station belonging to DNM through a World Bank-assisted project. • The station is fully automatic with a SIAP + MICROS AWS installed. • GBON parameters and other weather parameters are measured at the station. • The station is functioning but not transmitting data to WDQMS • Minor maintenance of the station is done by a designated member of the host community.	• The AWS is not configured to transmit coded synop messages.
6	**Tahoua**	• A manned station belonging to DNM but operated by ASECNA through its local subsidiary; AANN. • A staff strength of just three (3) personnel. • The station has manual and automatic instruments including one SIAP + MICROS AWS.	• The station is under-staffed and cannot adequately perform 24/7 observations and data transmission. • SIAP + MICROS station is installed far away from the enclosure and needs to be relocated to the enclosure.

		• GBON parameters and other weather parameters are measured at the station.	• The AWS is not configured to transmit coded synop messages.
		• The station previously had an upper air station, but it is no longer operational.	
		• The station is registered for international data exchange and transmits at least 10 messages daily through Niamey's collection centre.	
		• The station is equipped with a CAOBS Chrome app, which allows for the automatic generation of synop messages from AWS data.	
7	**Badaguichiri**	• The DNM owns the station in collaboration with the host community.	• The AWS is not configured to transmit coded synop messages.
		• The community secretary has been trained to carry out minor station maintenance.	
		• The station is fully automatic with a SIAP + MICROS AWS installed.	
		• GBON parameters and other weather parameters are measured at the station.	
		• The station was established for use in animal husbandry.	
8	**Dogaraoua**	• An AgroMet station belonging to DNM through a World Bank-assisted project.	• The AWS is not configured to transmit coded synop messages.
			• The AWS battery needs to be replaced.

		• The station is fully automatic with a SIAP + MICROS AWS installed. • GBON parameters and other weather parameters are measured at the station. • The station is currently not functioning due to a battery issue. • Minor maintenance of the station is done by a designated member of the host community.	
9	**Madaoua**	• A manned station belonging to DNM. • The perimeter fencing of the enclosure has been pulled down and needs replacement. • The station has manual and automatic instruments including one SIAP + MICROS AWS. • GBON parameters and other weather parameters are measured at the station. • An auxiliary staff with minimal training is currently working at the station	• No trained staff (observer) at the station presently. The only observer posted at the station is attending a training at the RTC in Nigeria. • The perimeter fencing needs replacement. • The AWS is not configured to transmit coded synop messages.
10	**Guidan Roumdji**	• The DNM owns the station in collaboration with the host community. • The community secretary has been trained to carry out minor station maintenance. • The station is fully automatic with a SIAP + MICROS AWS installed.	• There is a need to relocate the station as objects are obstructions within its vicinity. • The AWS is not configured to transmit coded synop messages.

		• GBON parameters and other weather parameters are measured at the station.	
11	**Tibiri**	• An AgroMet station belonging to DNM through a World Bank-assisted project. • The station is fully automatic with a SIAP + MICROS AWS installed. • GBON parameters and other weather parameters are measured at the station. • The station is functioning but not transmitting data to WDQMS	• The AWS is not configured to transmit coded synop messages.
12	**Maradi**	• A manned station belonging to DNM but operated by ASECNA through its local subsidiary; AANN. • A staff strength of just three (3) personnel. • The station has both manual and automatic instruments including one SIAP + MICROS AWS. • GBON parameters and other weather parameters are measured at the station. • The station previously had an upper air station, but it is no longer operational. • The station is registered for international data exchange, but it is currently transmitting every three hours to WDQMS.	• The station is under-staffed and cannot adequately perform 24/7 observations and data transmission. • Staff need re-training.

		• The station is equipped with a CAOBS Chrome app, which allows for the automatic generation of synop messages from AWS data.	
13	**Tessaoua**	• A manned station belonging to DNM. • The station has both manual and automatic instruments including one SIAP + MICROS AWS. • GBON parameters and other weather parameters are measured at the station. • An auxiliary staff with minimal training is currently working at the station	• No trained staff (observer) at the station presently. The only observer who was posted at the station is attending a training at the RTC in Nigeria. • The Stevenson screen needs replacement. • The AWS is not configured to transmit coded synop messages.
14	**Gazaoua**	• An AgroMet station belonging to DNM and being managed by the agric extension worker in the community. • The station is fully automatic with a SIAP + MICROS AWS installed. • GBON parameters and other weather parameters are measured at the station. • The station is currently not functional due to battery issues.	• The AWS is not configured to transmit coded synop messages. • The station is located inside an active office complex and may need to be relocated.
15	**Zinder**	• A manned station belonging to DNM but operated directly by ASECNA. • A staff strength of 10 meteorological personnel and 2 instrumentation experts.	• The need to include their personnel in WMO-related training opportunities.

| | | The station has both manual and automatic instruments including one SIAP + MICROS AWS. GBON parameters and other weather parameters are measured at the station. The station is in the process of updating its upper air station. The process has reached an advanced stage. The station is registered for international data exchange and is fully GBON-compliant The station is equipped with a CAOBS Chrome app, which allows for the automatic generation of synop messages from AWS data. | |

Recommendations

1. The Directorate of National Meteorology (DNM) has stations throughout the country. Some of these stations are operational, while others are not. However, one of the greatest challenges facing the Directorate is inadequate personnel, especially Meteorological Observers and Instrument Engineers. It is therefore highly recommended that efforts to assign more qualified personnel to the directorate be considered.

2. The majority of the stations directly under the operations of DNM and some managed by ASECNA/AANN are hindered from international data exchange due to a complete lack of computer hardware and internet connectivity. The provision of computers and internet facilities is recommended for this category of stations.

3. The DNM has a server in Niamey where raw observation data from its AWS network are stored. However, these observations cannot be exchanged internationally as they are not coded in Synop format. To solve this challenge, it is recommended that software with the capacity to code AWS raw data into Synop messages be deployed to DNM.

4. Deployment of WIS2.0 into the operations of DNM is considered a necessity. WMO and other development partners should consider Niger among the priority countries for this project.