CBS/GCOS Lead Centre

Direction de la Météorologie Nationale

**MOROCCO**

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# Report of CBS Lead Centre for GSN and GUAN Data for Northern Region I and Madagascar

Submitted by

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**Summary and Purpose of Document**

This document provides information on the activities of the CBS Lead Centre and information on the results obtained during the years 2014, 2015 and 2016.

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## 1. Background

CBS Lead Centres for GCOS have been designated by the World Meteorological Organization (WMO) Commission for Basic Systems (CBS) as being responsible for monitoring performance of GCOS networks, in particular of the GCOS Surface and Upper Air Networks (GSN, GUAN). They aim to improve the availability and quality of GSN data, contained in CLIMAT reports exchanged over the GTS, by exchanging the GSN monitoring information directly with NMHSs in accordance with the proposed terms of reference, and to support any follow-up action in designated areas of responsibility.

Implementation of activities of the Lead Centre should generally follow the procedures for WWW monitoring centres, as laid down in the Manual on the GDPS, Attachment II.7 (WMO - No. 485). The Lead Centre will focus on the activities in paragraph 2.

## 2. Activities

Terms of Reference of the CBS Lead Centres for GCOS are:

1. Diagnose problems in the GSN and GUAN by using the monitoring reports produced by the GCOS Monitoring and Analysis Centres;
2. Liaise with nominated National Focal Points for GCOS and other responsible officials about related Climatological Data in order to improve data and meta data availability and quality;
3. Support NMHSs for preparing CLIMAT messages in the standard format.
4. Co-ordinate activities with other GCOS centres and/or other centres as appropriate;
5. Monitor and report to CBS and GCOS on taken actions, achieved progress, concerns and recommendations on a yearly basis in a time frame that corresponds to planned AOPC and CBS meetings;
6. Assist AOPC in the revisions of GSN and GUAN stations;
7. Assist the WMO Secretariat in maintaining the list of National Focal Points for GCOS and related Climatological Data.

## 3. Areas of responsibility

Morocco, in the person of "la Direction de la Météorologie Nationale (DMN)", has been formally nominated as lead centre by the Acting President of the CBS in March 2006. He is responsible of the Northern Part of Region I (Northern, western and central Africa and Madagascar and Comoros islands) which includes the following countries:

Table 1: Country of the region RAI (Northern part of Africa)

| Northern Africa | Western Africa | Central Africa | Eastern Africa | Island |
|---|---|---|---|---|
| 1. Algeria<br>2. Egypt<br>3. Libya<br>4. Morocco<br>5. Mauritania<br>6. Tunisia | 7. Benin<br>8. Burkina Faso<br>9. Ivory Coast<br>10. Gambia<br>11. Ghana<br>12. Guinea<br>13. Guinea | 21. Cameroon<br>22. Chad<br>23. Congo<br>24. Guinea Equatorial<br>25. Central African Republic<br>26. Gabon | 27. Sudan | 28. Cape Verde<br>29. Madagascar<br>30. Sao-Tomé and Principe<br>31. Canaries |

| | | | | |
|---|---|---|---|---|
| | Bissau<br>14. Liberia<br>15. Mali<br>16. Niger<br>17. Nigeria<br>18. Senegal<br>19. Sierra Leone<br>20. Togo | | | islands<br>32. Comoros islands |


Figure 1: The DMN responsibility region's chart (RAI Africa in green)

## 4. Analysis, of the Reception by NCDC, of CLIMAT-Reports between 2013 and 2016.

In this report, we analyze the evolution of CLIMAT-Reports transmission over the years, according to three criteria:

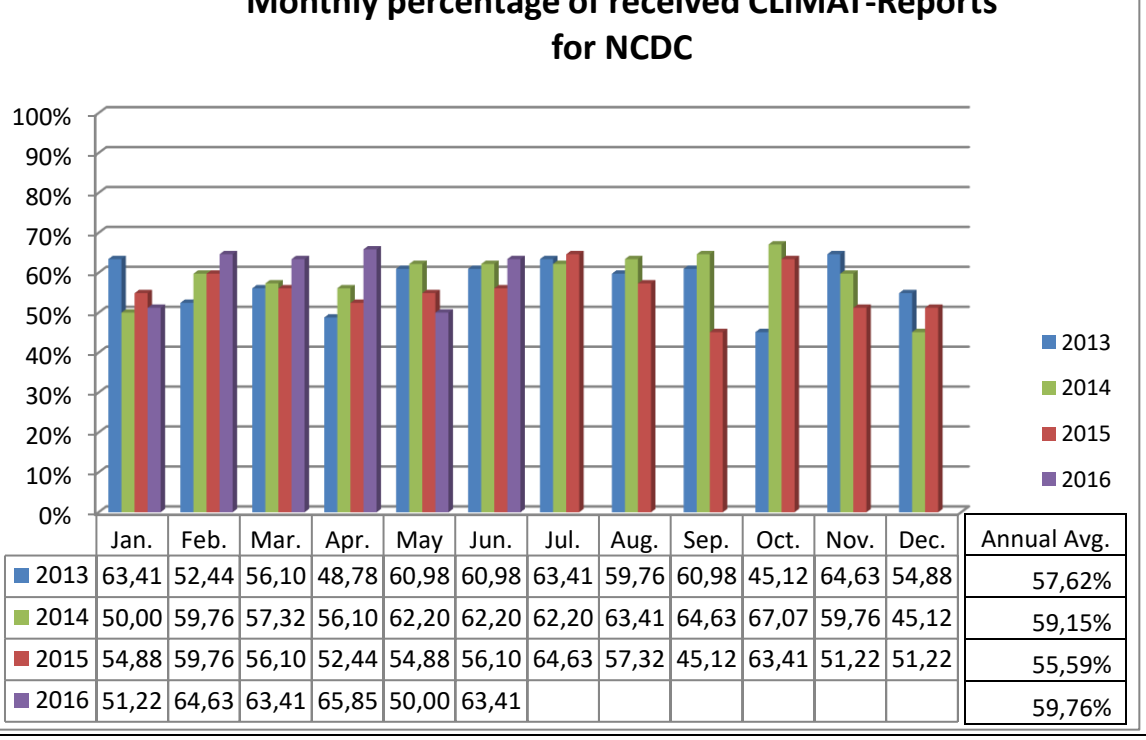
1. The number of countries without GSN station,
2. The number of countries with no focal point,
3. Evolution of the number of CLIMAT-Reports received at the NCDC, by country and station, based on years.

The 8 countries without GSN stations are: Gambia, Ghana, Guinea, Guinea-Bissau, Equatorial Guinea, Liberia, Central African Republic, Sao-Tome and Principe.

As in 2013, there are 10 countries with no focal points. 6 countries contain GSN stations: Benin, Chad, Comoros islands, Egypt, Mauritania and Sierra-Leone and 4 countries don't possess any station: Equatorial Guinea, Liberia, Central African Republic and Sao-Tome and

Principe. By 2015, The Congo was added to the list of countries with focal points meanwhile Egypt was deleted after the retirement of its focal point.

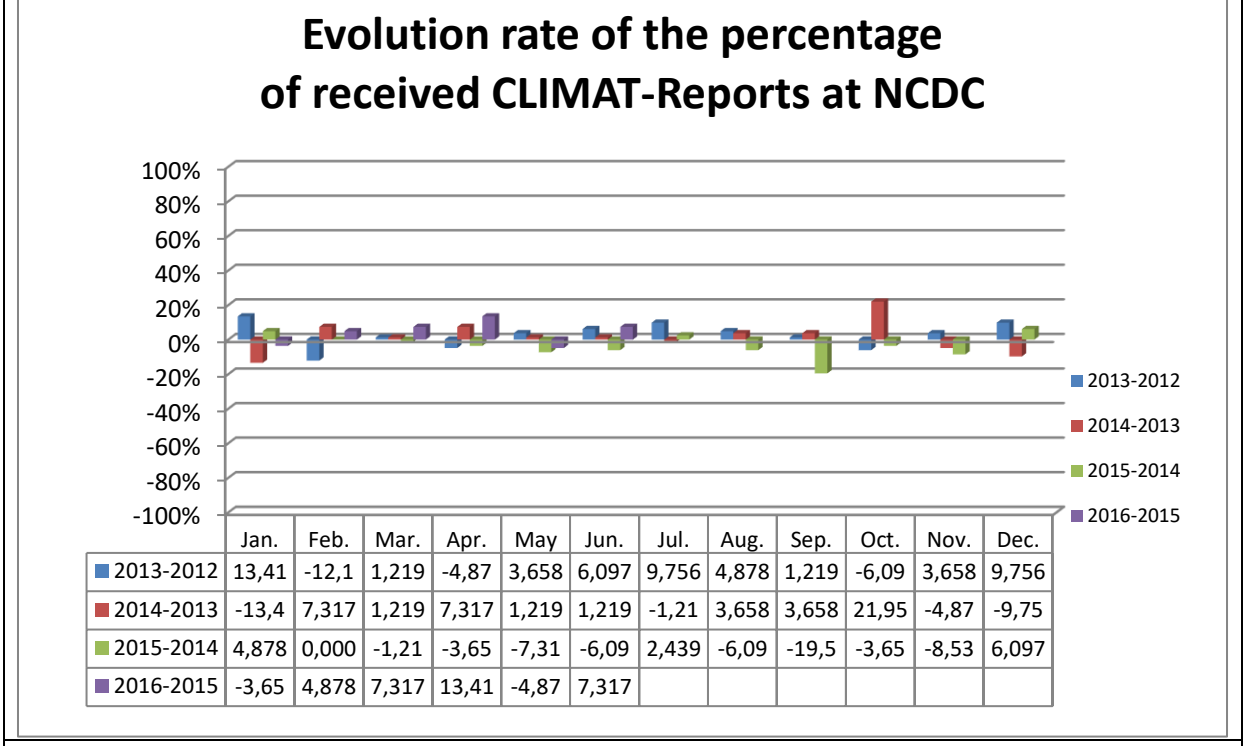
To approach the third axis that interests us most, and which concerns the evolution of the number of CLIMAT-Reports, we start with an overview showing the monthly evolution, over the last four years, of CLIMAT-Reports number of all countries and all stations combined, received at the NCDC (see Figure 2). This analysis reveals at first sight, that the percentage of received CLIMAT-Reports doesn't exceed 70% for all the months and for the four years. For its first six months, the year 2016 seems to record the best percentages in four months. Through the twelve months, upward percentages are observed from 2013 to 2014 in most of the cases (apart from November, December and January) while downward tendencies are noticed from 2014 to 2015 for eight months. Overall, 2016 may record the best percentages with the end of the year and 2014 is better than 2013 and 2015.




| | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. | Annual Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013 | 63,41 | 52,44 | 56,10 | 48,78 | 60,98 | 60,98 | 63,41 | 59,76 | 60,98 | 45,12 | 64,63 | 54,88 | 57,62% |
| 2014 | 50,00 | 59,76 | 57,32 | 56,10 | 62,20 | 62,20 | 62,20 | 63,41 | 64,63 | 67,07 | 59,76 | 45,12 | 59,15% |
| 2015 | 54,88 | 59,76 | 56,10 | 52,44 | 54,88 | 56,10 | 64,63 | 57,32 | 45,12 | 63,41 | 51,22 | 51,22 | 55,59% |
| 2016 | 51,22 | 64,63 | 63,41 | 65,85 | 50,00 | 63,41 | | | | | | | 59,76% |

Figure 2: Monthly percentage of received CLIMAT-Reports at NCDC during 2013, 2014, 2015 and 2016 (till June).

To better see the evolution, we can make the difference between the years: 2013-2012, 2014-2013, 2015-2014 and 2016-2015 (see Figure 3). The graph confirms that, throughout the twelve months, 2013 recorded a positive evolution when compared to 2012; negative differences are noticed for February, April and October. The positive evolution is observed between 2014 and 2013 as well, negative differences are noticed for January, July, November and December. Downward evolutions are observed for most months between 2015 and 2014; January and July are excluded. Increasing evolutions returned back between 2016 and 2015; decreasing tendencies are shown for two months only.




| | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013-2012 | 13,41 | -12,1 | 1,219 | -4,87 | 3,658 | 6,097 | 9,756 | 4,878 | 1,219 | -6,09 | 3,658 | 9,756 |
| 2014-2013 | -13,4 | 7,317 | 1,219 | 7,317 | 1,219 | 1,219 | -1,21 | 3,658 | 3,658 | 21,95 | -4,87 | -9,75 |
| 2015-2014 | 4,878 | 0,000 | -1,21 | -3,65 | -7,31 | -6,09 | 2,439 | -6,09 | -19,5 | -3,65 | -8,53 | 6,097 |
| 2016-2015 | -3,65 | 4,878 | 7,317 | 13,41 | -4,87 | 7,317 | | | | | | |

Figure 3: Evolution rate of the percentage of received CLIMAT-Reports at NCDC during 2013, 2014, 2015 and 2016.

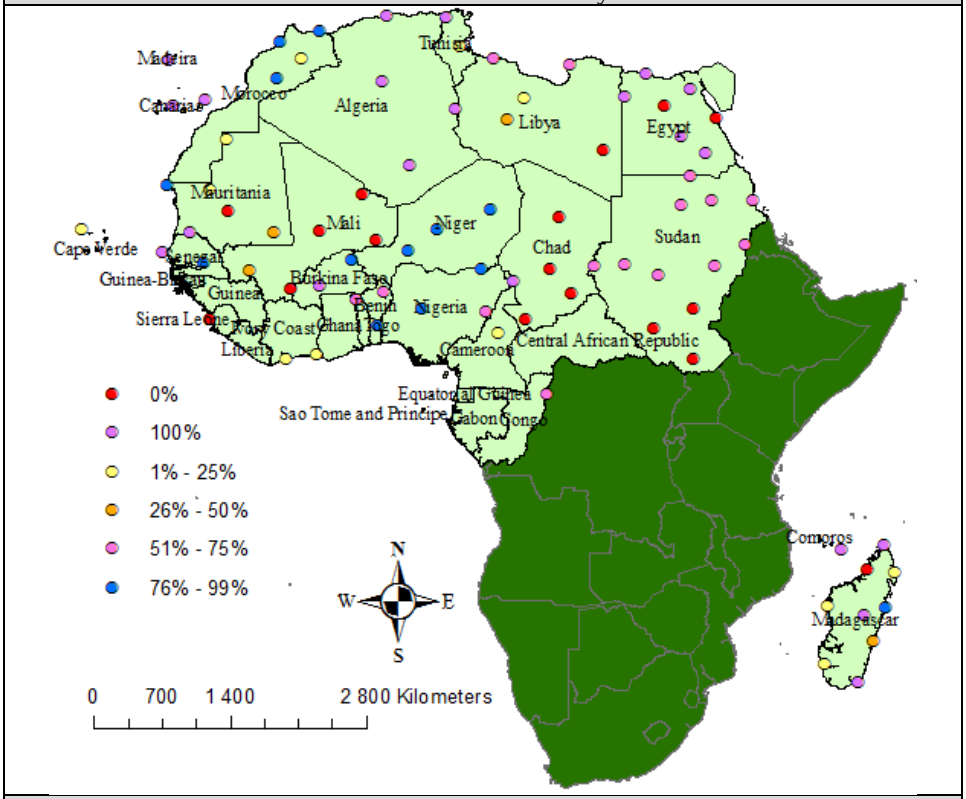
During the year 2013, CLIMAT-Reports availability (Figure 4 A) was good to rather good for: Morocco (apart from one station), Algeria, 1 station from Tunisia, Egypt (apart from 2 stations), Sudan (apart from 3 stations), 1 station from Chad, Niger, Nigeria (apart from 1 station), Burkina Faso, Senegal, 1 station from Mauritania, the Canarias, the Comoros and 4 stations from Madagascar. On a country scale, moderate to bad records were shown in Libya, Chad, Congo, Cameroon, Togo, Mali, Ivory Coast, Mauritania, Sierra-Leone and Cap Verde.

When compared to 2013, the year 2014 (Figure 4 B) witnessed the good to rather good availability of CLIMAT-Reports from all the stations from Morocco, the Congo, Nigeria and Benin meanwhile reports from only 3 stations were available in Madagascar. Otherwise no important changes were noticed when compared to 2013.

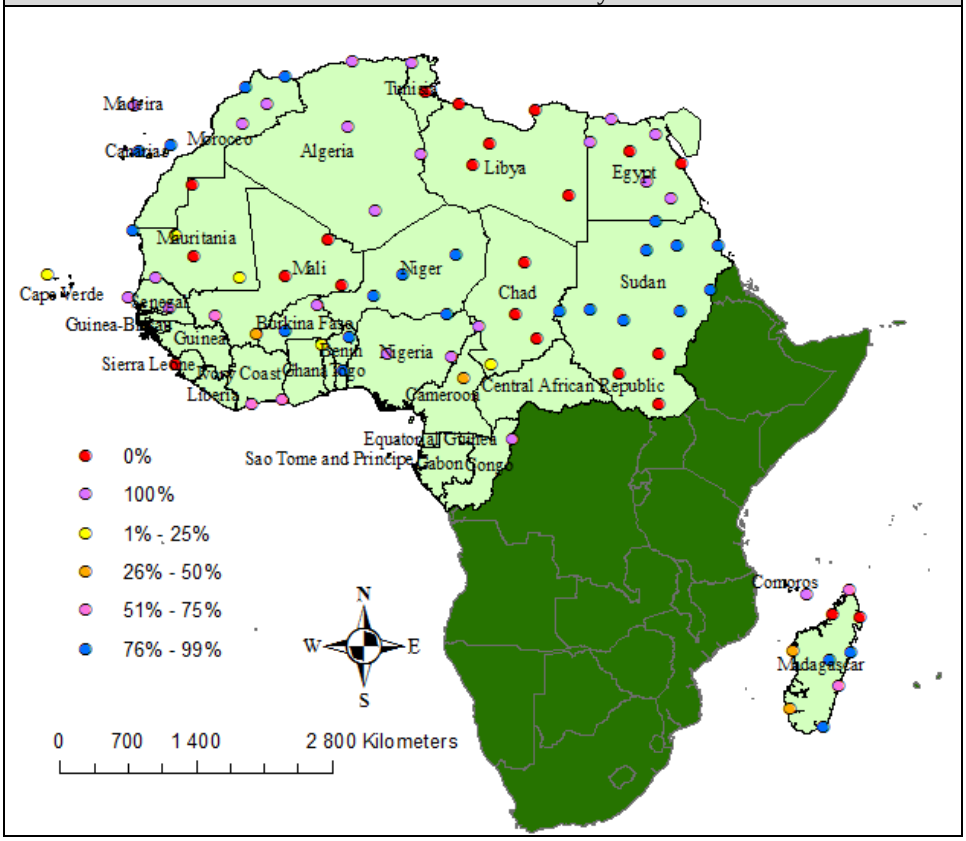
In the year 2015 (Figure 4 C) compared to 2014, we noticed the availability of CLIMAT-Reports of one station from Chad, 2 stations from Mali and the two stations from Ivory Coast. Availability of reports from Egypt and Niger was moderate to bad that year.

Even though, the year 2016 (Figure 4 D) seems to be promising, as the first six months witnessed the returning back of many stations and the moderate availability of many CLIMAT-Reports, reports from 1 station in Tunisia, 4 in Libya, 3 in Sudan, 3 in Chad, 1 in Cameroon, 3 in Mali, 1 in Sierra Leone, 4 in Mauritania and 5 in Madagascar are still lacking.

A: Percentage of received CLIMAT-Reports
Selection: GSN-Station for the year 2013




B: Percentage of received CLIMAT-Reports
Selection: GSN-Station for the year 2014



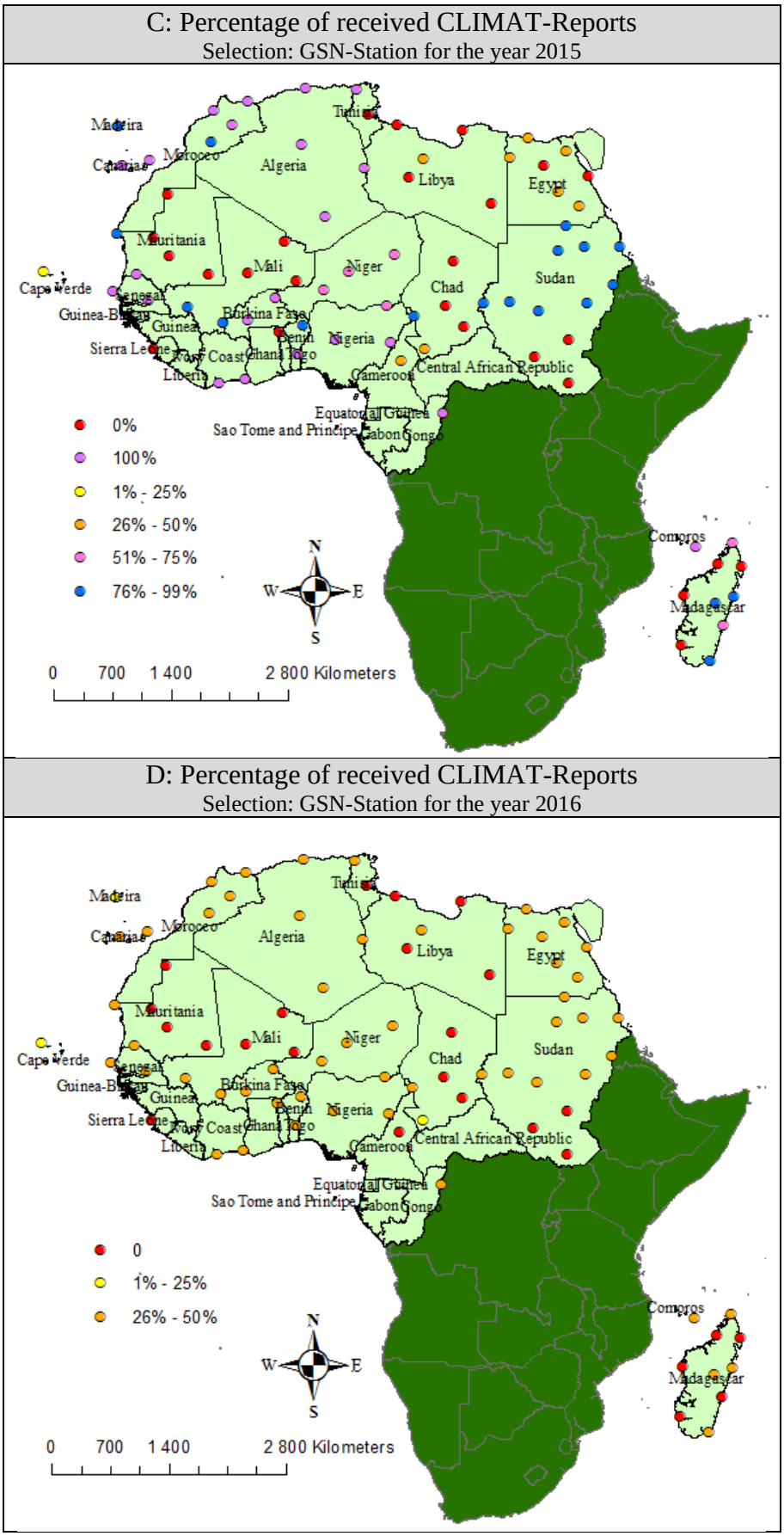


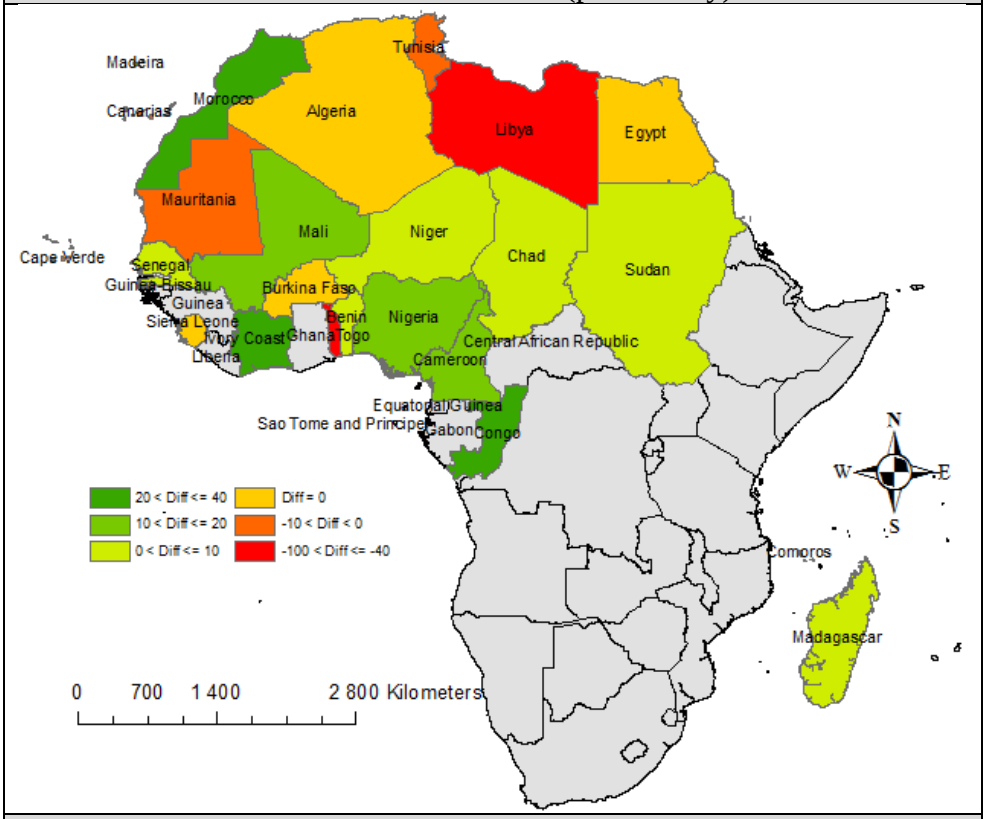

Figure 4: Percentage, by country, of received CLIMAT-Reports at NCDC during 2013 (A), 2014 (B), 2015(C), 2016 (D)

Analyzing the evolution of CLIMAT-Reports availability from one year to another, we can notice the positive evolution in many countries from 2013 to 2014 (Figure 5A), we especially mention: Morocco, Sudan, Chad, Congo, Benin, Ivory Coast, Mali, Senegal and Madagascar. Downward evolution is noticed for Tunisia, Mauritania, Cap Verde, the Canarias, Togo and Libya; the latter two countries recorded the greatest decrease.

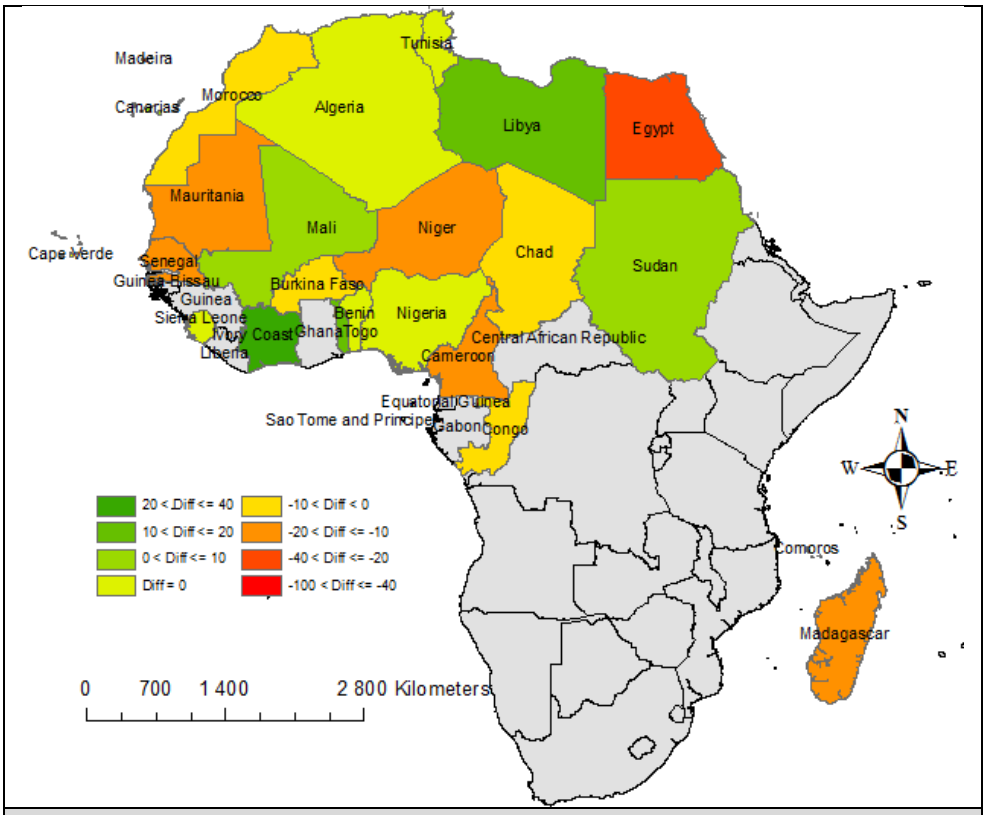
From 2014 to 2015 (Figure 5B), Libya, Togo and the Canarias recorded an upward evolution meanwhile many other countries declined, mainly: Morocco, Egypt, Chad, Congo, Cameroon, Niger, Burkina Faso, Senegal, Mauritania and Madagascar.

By the year 2016 (Figure 5C), Morocco and Egypt returned back and registered a positive evolution while Cameroon, Senegal, Mauritania and Madagascar continued their negative evolution. CLIMAT-Reports availability decreased for Sudan and Ivory Coast as well.

A: Difference of percentage of received climate reports between 2014 and 2013 (per country)




B: Difference of percentage of received climate reports between 2015 and 2014 (per country)




C: Difference of percentage of received climate reports between 2016 and 2015 (per country)

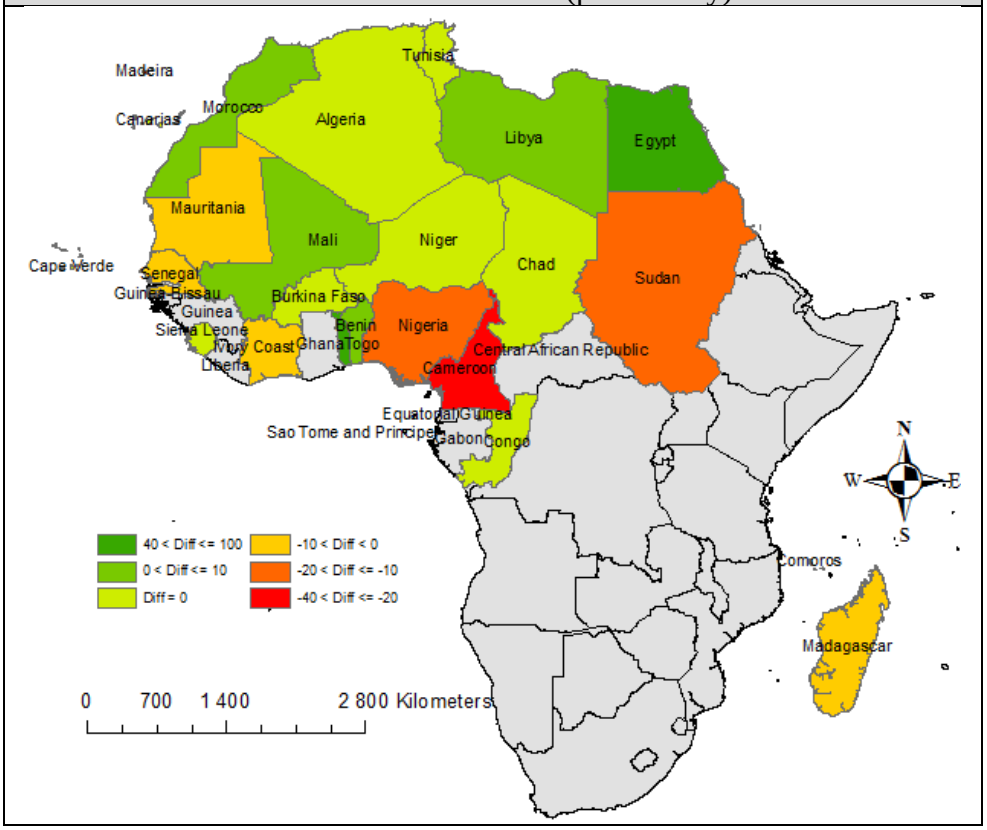



Figure 5: Difference between years, of averaged percentage of CLIMAT-Reports availability in each country (A. 2014-2013, B. 2015-2014, C. 2016-2015)

## 5. Individual cases discussion and solution proposals

In Tunisia, the station of GABES sent no message from January 2013, a mail was sent to the focal point explaining the situation and requiring intervention; changing the station with a more active one may be a good solution.

The stations of TESSALIT, TOMBOUCTOU and MENAKA from Mali have never sent their CLIMAT messages; the address mail of the focal point is not available.

Mainly during 2015 and 2016, the 4 stations from Mauritania: BIR MOGHREIN, ATAR, TIDJIKJA and NEMA didn't send any message, Mauritania has no focal point.

From 2013 to 2016, No CLIMAT report is received from the only station LUNGI that belongs to Sierra Leone, this country has no focal point.

Through the 4 years, availability of CLIMAT-Reports, from the 4 Lybian stations: SWANI, BENINA, SEBHA and KUFRA, is too bad attending 0% mainly in 2014 and 2016, a mail was sent to the focal point explaining the situation and requiring intervention, but the address used returned a mail delivery error.

In Sudan, the stations of WALKAL, WAU and JUBA have never sent their CLIMAT messages, a mail was sent to the focal point explaining the situation and requiring intervention.

In Chad, three of five stations do not send messages; the country has no focal point.

In 2016, the only station in Cameroon, NGAOUNDERE, sent no message; a mail was sent to the focal point explaining the situation and requiring intervention.

From Madagascar, availability of CLIMAT-Reports of 5 stations (out of 9) decreased notably and reached 0% by the year 2016, we mention the stations of: ANALALAVA, ANTALAHA, MAINTIRANO, MANANJARY and TOLIARA. A mail was sent to the focal point explaining the situation and requiring intervention.

## 6. Taken actions:

To overcome the lack in our region of responsibility, many contacts have been made as revealed above. We are waiting the reactions of the approached persons. Here after a synthesis of the taken actions with a reminder of the old ones that will be enhanced with further actions:

- An official letter was sent to the head of Midelt station requesting the regular sending of CLIMAT Report messages;
- An Improvement Sheet (Form) was opened to solve the problem (as required by the DMN Quality Management System);
- The collection and transfer of World Weather Record (WWR) data for several countries;
- After raising the question of no message reception since June 2014, by NCDC, at the Khartoum GUAN station, messages were sent to the Sudan Focal Point who clarified the situation;
- A message was sent to the Sudan Focal Point asking to solve the problem of no reception for November 2015 of any CLIMAT Report from Sudan GSN station. Result: re-sending CLIMAT data (manually);

- The adoption of an automatic tool (through TRANSMET = Moroccan telecommunication system for exchanging meteorological data) to follow Moroccan network (GSN and RBCN) CLIMAT Report;
- A message was sent to the Senegal Focal Point asking him CLIMAT Report data for November 2015 for all GSN station. No response;
- A message was sent to the Niger focal point to report a problem at the Niamey-Aero GUAN station;
- A message was sent to the Algerian Focal Point suggesting the addition of 3 GSN station from Algeria (with a map showing the areas and the target stations): No response;
- A message was sent to the Director of Meteorology of Chad to report the No CLIMAT Report reception from stations numbered: 64751 64753 64754. No response.
- Some messages were also exchanged with the Director of Meteorology of Central African Republic who has promised to review the situation but no news until now. Designation of focal point for this country was asked but no proposition.
- Messages were sent to the Director of Meteorology in Mauritania asking the designation of focal point for this country but no proposition till now.
- A message was sent to Togo asking the focal point e-mail address, but no response.

## 7. Conclusions:

In general, the year of 2016 looks promising and may record good Climat-Reports availability with the end of the year and 2014 is better than 2013 and 2015. However, some countries or stations have never sent CLIMAT-Reports. The proposed solutions will vary according to each case:

- ✓ Countries not sending messages: we will continue our efforts to contact the concerned, identify the problems and seek solutions. The designation and updating of the focal points will be of great help.
- ✓ Stations that do not send messages: it may be judicious to change them with more active ones.
- ✓ In some cases (poor countries), the WMO assistance can be a part of the solution. The experience of Madagascar is a good example.