

WORLD METEOROLOGICAL ORGANIZATION

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REGIONAL ASSOCIATION I

(18.VIII.2006)

FIFTH SESSION OF THE REGIONAL
ASSOCIATION I WORKING GROUP ON
PLANNING AND IMPLEMENTATION OF THE
WWW

ENGLISH only

NAIROBI, KENYA, 25-29 SEPTEMBER 2006

RESULTS OF QUESTIONNAIRE ON STATUS OF IMPLEMENTATION OF THE WORLD WEATHER WATCH IN RA I – ALL INTEGRAL ANSWERS

(Submitted by the Secretariat)

Summary and purpose of document

This document contains the results of the questionnaire distributed in 2005 to assess the operation and progress of implementation of WWW in RA-I (Africa).

ACTION PROPOSED

The Working Group is invited to:

- (a) Take note of the figures, reports and ideas expressed by the 21 countries who answered;
- (b) Consider them for aiming at proposing the way forward for improving the WWW Basic Systems in RA I;
- (c) Use them to make recommendations on the relevant agenda items to the fourteenth session of RA I for necessary follow-up actions.

Reference:

-See compiled answers in Doc. 4.2(1)

QUESTIONNAIRE TO ASSESS THE OPERATION AND PROGRESS OF IMPLEMENTATION OF WWW IN RA-I (AFRICA).

June 2005

1. PREAMBLE

The thirteenth session of Regional Association-I-(Africa) held in Mbabane, Lesotho from 20-28 November 2002 decided to re-establish a Working Group on **Planning and Implementation of the World Weather Watch** (WWW) in the region. The Session recognized that:

- Continuous developments in science and technology call for continuous adjustments in the WWW facilities.
- The interest in WWW implementation and operation is wide and not limited to individual countries.
- WWW data and products are of vital importance to members in RA-I for meeting the increasing requirements of users for meteorological services.

The major tasks provided under the terms of reference of the working group include the following:

- To monitor the progress of implementation of WWW facilities and relevant projects.
- To keep under review the design of the regional basic synoptic network (RBSN)
- To continue to monitor and coordinate the implementation and operation of the telecommunication loop (Algiers-Cairo-Nairobi- Niamey - Dakar-Algiers).
- To monitor and coordinate the implementation and operation of modern technologies.
- To review and coordinate the implementation of Regional Specialized Meteorological Centers (RSMCs).
- To review and coordinate the automation of real time functions of National Meteorological Centres (NMCs)
- To monitor the regional WWW system, review character codes and keep under review the implementation of Public Weather Services Program (PWSP) and training requirement in aspects related to new concepts of WWW components.
- Monitor the implementation of table driven codes and conduct relevant training.
- Strengthen the availability and integration of AMDAR.

This questionnaire assesses the operation and progress of implementation of WWW in RA-I(Africa) with the aim of proposing the way forward for improving the WWW Basic Systems.

2. ACTION REQUIRED

Please complete the questionnaire and return to WMO not later than 15 September 2005, preferably *by email to the following address: wwwmail@wmo.int and jmartellet@wmo.int*

3 QUESTIONS

PLEASE INDICATE YOUR COUNTRY HERE:

OPERATION AND PROGRESS OF IMPLEMENTATION OF WWW FACILITIES AND RELEVANT PROJECTS

3.1 Global Observing System

- a) What are the numbers of surface and upper air stations operated by your National Meteorological/Hydrological Service (NMHS)?

Surface: Algeria 76, Benin: 107 Congo-Brazza: 17 Cote d'Ivoire: 14 Egypt: 150 Ethiopia: 17 La Réunion: 9 Gambia: 15 Guinea-Bissau: 5 Kenya: 35 Libya: 24 Morocco: 47 Mauritius: 6 Niger: 14 Senegal: 12 Seychelles: 6 Spain: 21 Tanzania: 27 Chad: 14 Tunisia: 26 Uganda: 38
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Upper-air: Algeria 12 Benin: 3 Congo-Brazza: 5 Cote d'Ivoire: 5 Egypt: 6 Ethiopia: 2 La Réunion: 5 Gambia: 1 (PILOT balloon) Guinea-Bissau: no Kenya: 1 35 Libya: 4 Morocco: 3 Mauritius: 4 Niger: 2 Senegal: 4 Seychelles: 1 Spain: 2 Tanzania: 3 Chad: 2 Tunisia: PILOT 7 RS 2 Uganda: 1
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- b) How many are meeting the RBSN programme requirements (2 upper soundings or 4 surface observations per day)?

For surface: Algeria 38 Benin: 45 Congo-Brazza: 11 Cote d'Ivoire: 10 Egypt: 31 Ethiopia: 17 La Réunion: 9 Gambia: 15 Guinea-Bissau: 3 Kenya: all 35 Libya: 8 Morocco: 4 Mauritius: 5 Niger: 14 Senegal: 12 Seychelles: 2 only Spain: 4 Tanzania: 12 Chad: 4 Tunisia: 26 Uganda: 2

For upper-air: Algeria 10 Benin: 3 Congo-Brazza: 3 Cote d'Ivoire: nil Egypt: 6 Ethiopia: 1 La Réunion: 0 Gambia: nil Guinea-Bissau: no Kenya: 1 35 Libya: 1 Morocco: 1 or 2 Mauritius: 1 Niger: 2 Senegal: 1 Seychelles: fully meet requirements 2 Tanzania: none Chad: 2 Tunisia: PILOT 7 RS 2

- c) If the answer in (b) is not all, what are the main causes of the limitation of the observing programme?

For surface: Benin: financial means, limited human resources
Congo-Brazza: lack reliable communication means, insufficient staff, 3 stations still not declared to WMO, therefore not in bulletins, many stations are not complete without measure of pressure and wind
Cote d'Ivoire: war for 3 years
Guinea-Bissau: The main causes of the limitation of the observing programme is the economic situation of our country and civil war that the contry endured in 1998.
Mauritius: resouces
Seychelles: Lack of spare parts. Automatic weather stations are not robust for the Marine Environmental conditions
Spain: the lack and the incidences related to staff, technical incidences related to the automatic weather stations
Tanzania: lack of staff
Uganda: : Lack of resources/ manpower and finances

For upper-air: Congo-Brazza: Only radio-soundings, pilot with balloon have stopped (lack of theodolites)
Cote d'Ivoire: 3 stations not operational (Bouake, Korhogo et Man) because of war and Abidjan demolished after explosion in 2001. Tabou is also out of order for many years.
Ethiopia: Lack of consumables due to the high cost of Radiosondes. Upper-air soundings are carried out once a day because of budgetary constraints to buy enough radiosondes.
La Réunion: Only 1 sounding per day (reason: budget and usefulness)
Gambia: Lack of consumables (Hydrogen gas and balloons)
Guinea-Bissau: no station
Kenya: expensive consumables to operate more than one upper air station
Libya: The high cost of equipment
Morocco: the cost of sounds (very expensive)
Mauritius: consumables, equipment
Senegal: 3 stations for PILOT (61600,61687,61695) have difficulties for consumables or gaz. Station 61687 performs only the sounding of 12 UTC.
Seychelles: Hydrogen generator needs replacement since it is more than 30 years
Spain: Technical incidences related to the automatic sounding equipment
Tanzania: Obsolete sending system for two Upper Air Stations Cost of sondes limits operations to 1 upper sending day
Uganda: : Lack of the required resources for the soundings

d) What are the national strategies to address the problems identified in (c) and how much funds are allocated annually for operating and improving the observation networks?

For surface: La Réunion: annual budget 1 million Euros
Algeria: A study for optimizing the network has been programmed. Following consequential measures will be applied.
Benin: training and motivation of staff already limited in number
Congo-Brazza: every year the government has planned to re-habilitate one station (this year: Impfondo, equipment purchased, cost: 67 788.21 euros, inform WMO of opening, re-inforce staff in RBSN stations
Cote d'Ivoire: re-habilitate and repair all stations presently running and re-building 4 stations stoped because of the war.
Gambia: Around US\$5000 (five thousand United States Dollars) is allocated each year for the replenishment of network instruments. As a strategy to address the problem, we are continually lobbying government support to increase the allocation. This we hope to achieve through better reporting on budgetary matters, i.e., by providing a balance sheet of achievements/outputs during a budget year versus the resources (monetary) provided by the government.
Guinea-Bissau: We have no national strategy to address the problems. There is no allocated fund for operating and improving the observation networks.
Mauritius: The Station at Plaine Corail airport, Rodrigues island will be fully operational in a near future
Seychelles: The sustainability and strengthening of the observation network has been

rated a priority area in the National Meteorological Services. The general strategy is to highlight this as a weakness of the early warning system. Engage partnership programs with private companies/stakeholders in this initiative
Spain: The manual stations are being upgraded by means of installing semi-automatic observing systems (22,000 Euros/station) – Training technical staff – some kind of maintenances have been contracted with external companies – the current contract for the maintenance and improvements of the semi-automatic stations comes to 3,500 Euros per station.
Tanzania: Training is being done at least 20 new staff are recruited every year
Tunisia: 220000 US \$
Uganda: Look for external financial support
For upper-air:
Algeria: A study for optimizing the network is currently developed
Congo-Brazza: for Impfondo acquisition of one theodolite
Cote d'Ivoire: rebuild all stopped stations
Ethiopia: to ensure at least one upper-air sounding a day, our NMC endeavored to provide the supply of radiosondes from its limited resources. Nearly USD 75,000 is spent to buy Radiosondes and balloons for one year consumption. In recent years, however, radiosondes were purchased under projects funded by the European Union. Requesting the support of foreign donors for financial assistance is the main strategy to maintain the continuous operation of the station.
Guinea-Bissau: no station
Kenya: THE KENYA METEOROLOGICAL DEPARTMENT HAS SUCCESSFULLY LOBBIED FOR AN INCREASE IN THE BUDGETARY ALLOCATION AND THE GOVERNMENT OF KENYA HAS PROVIDED RESOURCES TO KMD WITHIN THIS FINANCIAL YEAR (2005/06) TO UPGRADE THE OPERATIONAL UPPER AIR STATION AND REVIVE AT LEAST ONE SILENT STATION.
Libya: from 2006
Morocco: Upper-air stations are being upgraded to be fully digital
Mauritius: Seeking assistance especially financial through trilateral agreement
Senegal: A refurbishing of equipments and installations has been done, acquisition of consumables must now be done. An operation budget of 20 millions CFA is attributed every year for operation of the upper-air network.
Seychelles: Continue to collaborate with UK Met Office
Spain: Training technical staff – A contract has been signed with a specific company in order to ensure maintenance – the current contract for the maintenance comes to 1,650 Euros per station.
Tanzania: Efforts are being done to upgrade the two station. Shortage of funds is the main problem
Tunisia: 375000 US \$
Uganda: Look for external financial support

e) What would you propose as the best approach for the region to address the problems affecting the GOS?

Algeria: Automation with satellite transmission
Benin: Make public and politician interested in meteorology
Congo-Brazza: re-habilitate stations in RBSN, inform more non-meteorologist decision

makers on the importance of meteorology and its goals, priority for VCP: operational RBSN stations, involve more focal points in regional activities for GOS, funds from ASECNA benefits should go for stations maintenance
Cote d'Ivoire: modernize observation equipment, telecommunication and data processing systems
Egypt: 1- Our department of international Affairs, 2 -EMA Web Site
Ethiopia: - Technical cooperation is required between member countries for maintaining the operation of the stations. - The Regional Telecommunication Hubs located in Region I should play a leading role in identifying and addressing the problems regarding the network of stations in their zone of responsibility. The RTH need to give proper attention and follow up to tackle the problems affecting GOS. - To fill the gap in GOS the support of sub-regional organization such as Inter Governmental Authority for Drought (IGAD) and other international organizations is indispensable. Financial support from African Union needs to be requested for maintaining the networks. - Exploring assistance through Voluntary Cooperation Programmes would remain the backbone of GOS in Africa.
La Réunion: Improve equipment reliability, ensure preventive and corrective maintenance. Affect in priority VCP funds to GOS.
Gambia: Select strategic locations (stations) within the region to form a network that would meet the data/information requirements and provide them with the relevant support to ensure their full and unhindered operation.
Guinea-Bissau: I propose the telecommunication that can help us for data exchange in the National and Regional Observing Programme. Buy meteorological and telecommunication classic equipments. Capacity building.
Kenya: THE REGION NEEDS TO ADOPT A REGIONAL APPROACH TO NEGOTIATE FOR PROCUREMENT OF EQUIPMENT AND CONSUMABLES AT REDUCED COSTS.
Mauritius: - Increase the number of observation stations both surface and upper air - Install equipments for upper air observations - Improve communication
Niger: Acquisition and implementation of WAS, improve data collection and transmission means from the stations, Implement the Regional project for observation data production through rehabilitation of surface and upper-air silent stations, Implement AMDAR project, improve observations at sea.
Senegal: Use automatic stations, use modern measure instruments, couple AWS with DCP for collection, use solar systems for energy.
Seychelles: This matter should be rated as one of the priorities in the Region.
Spain: By installing semi-automatic observing systems with appropriate plan of maintenance
Tanzania: Efforts should be made to ensure that consumables for sending systems are available At a lower price
Chad: creation of new stations and implementation of transmission equipment
Tunisia: training of observers and maintenance technicians, automate observation networks
Uganda: Automation of all synoptic stations, Further training of meteorological personnel into specialized areas, Increased density of observing centers

f) What are the most recent meteorological observation systems implemented in your country?

Algeria: WAS for air navigation assistance installed or being installed
Benin: MSG, Radio-sounding station in Cotonou
Cote d'Ivoire:MSG
Egypt: Synoptic – Climatological – Aviation – Agromet – Upper air Observation system.
Ethiopia: 3 Automatic Weather Stations (AWS) had been installed in three surface stations at Mekelle (63330), Gonder (64331) and Diredawa (64471).
La Réunion: CAOBS
Gambia: Still using the conventional system of observation
Guinea-Bissau: The most recent meteorological observation system implemented in our country is the PUMA project.
Kenya: TWO DOPPLER WEATHER SURVEILLANCE RADARS HAVE BEEN INSTALLED. THREE MORE WILL BE INSTALLED WITHIN THIS FINANCIAL YEAR OF 2005/06
Libya: 18 manual stations
Morocco: automated stations to measure classical meteorological parameters (wind force and direction, temperature and humidity), in addition to clouds and visibility.
Mauritius: MSG
Niger: 2 automatic stations installed at Niamey airport: on SIOMA station for aeronautical observation, one synoptic automatic station for the synoptic station of Niamey
Senegal: AWS "CIMEL INTEGRATEUR"
Seychelles: Replacement of standard rain gauges and other conventional instruments including thermometers etc..
Spain: semi-automatic observing systems have been installed in the manual synoptic network. In the airports, these systems have been integrated with the aeronautical observing system. One automatic radiosounding system (Autosonda)
Tanzania: Introduction of AWS
Chad: AWS
Tunisia: marine automatic station, upgrade automatic stations
Uganda: Initiation of automation of some synoptic stations, MTAP –MSG Receiver installed, Received 10 AWOS, Received conventional Instruments from Casella
Any automated stations? Algeria: Yes Benin: no, Congo-Brazza: yes Cote d'Ivoire: no Egypt: yes Ethiopia: yes La Réunion: yes Gambia: No (An automatic weather station exists, but it is not operational due to power (battery not working) problems Guinea-Bissau: no Kenya: yes Libya: yes Mauritius: yes Niger: yes Seychelles: no Spain: yes Tanzania: yes Chad: yes Tunisia: yes Uganda: yes
If yes, how many? Algeria: 08 Congo-Brazza: 1 (still experimental) Egypt: 22 + 6 upper-air Ethiopia: 3 La Réunion: 9 Kenya: 8 OPERATED IN COLLABORATION WITH THE KENYA AGRICULTURAL RESEARCH INSTITUTE (KARI) Libya: 6 AWS and 1 DCP Mauritius: 23 Niger: 2 Spain: 21 (10 AWS, 7 semi-automatic in airports, 3 semi automatic + 1 Auto sonde) Tanzania: 14 Chad: 1 Tunisia: 24 Uganda: 10

g) How many RBSN stations of your country are not operational if any?

Surface: Algeria: 01 (in Guezzam) Benin: 0 Congo-Brazza: 1 Cote d'Ivoire: 4 Egypt: none Ethiopia: none La Réunion: 0 Gambia: nil Guinea-Bissau: 4 Kenya: none Libya: nil Mauritius: none Niger: none Senegal: 0 Seychelles: 4 not operational Tanzania:none Chad: 3 with H12 Tunisia: 0 Uganda: 12

Upper-air: Algeria: 03 (in Amenas, Constantione, Tindouf) Benin: 0 Congo-Brazza: 3 (for PILOT) Cote d'Ivoire: 5 Egypt: none Ethiopia: none La Réunion: 0 Gambia: 1 pilot balloon station not operational since 1991 Guinea-Bissau: 0 Kenya: 1 Libya: 1 in Ghadames Morocco 1 Mauritius: 2 Niger: none Senegal: 0 Seychelles: none Tanzania: 2 Tunisia: 0 Uganda: 1

h) Do you use all the RBSN station data of your country in your operations?

Surface: Algeria: Yes Benin: yes Congo-Brazza: yes Cote d'Ivoire: no Egypt: yes Ethiopia: All 17 stations data are used on daily basis La Réunion: yes Gambia: yes Guinea-Bissau:yes Kenya: yes Libya: yes Morocco: Yes Mauritius: yes Niger: all Senegal: yes Seychelles: yes Spain: yes Tanzania: yes Chad: yes, 14 Tunisia: yes Uganda: yes

Upper-air: Algeria: Yes Benin: Yes Congo-Brazza: yes Cote d'Ivoire: no Egypt: yes Ethiopia: One upper station data is used on daily basis La Réunion: yes Gambia: not available Guinea-Bissau: no Kenya: yes Libya: yes Morocco: yes Mauritius: yes Niger: all Senegal: yes Seychelles: yes Spain: yes Tanzania: yes Chad: yes, 2 Tunisia: yes Uganda: yes

i) Do you use all the RBSN station data of other RA I countries in your operations?

Surface: Algeria: Yes Benin: part of them Congo-Brazza: yes Cote d'Ivoire: no Ethiopia: All the RBSN data in region I are used for operational purposes if it is available on timely basis. La Réunion: yes Gambia: yes Guinea-Bissau: yes, but no connection to GTS Kenya: yes, though there are occasional transmission interruptions Libya: yes Morocco: not all Mauritius: all Niger: West Africa, Central Africa, North Africa Senegal: yes Seychelles: yes Tanzania: yes, we use them when available Chad: yes Tunisia: yes Uganda: yes

Upper-air: Algeria: Yes Benin: Yes Congo-Brazza: yes Cote d'Ivoire: no Ethiopia: All the upper-air stations data in region I are used for operational purposes if it is available on timely basis. La Réunion: yes Gambia: yes Guinea-Bissau: no Kenya: yes Libya: yes Morocco: not all Mauritius: all Niger: West Africa, Central Africa, North Africa Senegal: yes Seychelles: yes Tanzania: yes Chad: yes Tunisia: yes Uganda:yes

j) If not all, what is the percentage of RA I RBSN station data that you use?

Surface: Algeria: All RBSN stations from adjacent RA I Countries Benin: 70% Congo-Brazza: 60% Cote d'Ivoire: 47% Guinea-Bissau: all available Tunisia: 30 to 40 %

Upper-air: Algeria: All RBSN stations from adjacent RA I Countries Benin: 100% Congo-Brazza: 40% Cote d'Ivoire: 20% Guinea-Bissau: none

3.2 Global Telecommunication Systems

a) What is the general status of the Meteorological Telecommunication Networks operated by your National Meteorological/Hydrological Service (NMHSs) for data collection and retransmission?

Algeria: Very good,
Benin: SBB and PTT telephone
Congo-Brazza: very obsolete, old
Cote d'Ivoire: defective
Egypt: We are using GTS for Data Transmission and data collection via telephone
Ethiopia: Currently the national Meteorological Communication Network is operational. Data is collected on real-time from all national stations. The main problem is related to the global exchange of the data. The communication link between our NMC and RTH-Nairobi is not operational. All our efforts to resolve the problem failed because of the incompatibility of the digital data line in Ethiopia and the analog line on the Kenyan side. Other options such as VSAT link were proposed but that also failed due to national regulatory reasons
La Réunion: satisfactory
Gambia: Generally poor. Most of the SSB radios are obsolete (due to age) and lack accessories such as batteries, solar panels. The national electricity grid does not serve most of the country. Telephone facilities are yet to reach most of the network stations.
Guinea-Bissau: only SBB used
Kenya: THE GENERAL STATUS OF THE NATIONAL TELECOMMUNICATION NETWORK IS OKAY. FOR TRANSMISSION OF DATA TO OTHER NMSS OUTSIDE OUR NETWORK, WE AT TIMES ENCOUNTER PROBLEMS THROUGH OUR NATIONAL TELECOMMUNICATIONS SYSTEM
Libya: collecting data via MSG, RETIM 2000 Europe, RETIM 2000 Africa and SADIS receivers, Sending data via AFTN circuits
Mauritius: good, our networks meet international standards
Seychelles: All stations have DCP capability and observations are sent via Meteosat
Spain: The networks are automated with one central node in Madrid for the whole country. In general we use leased line with frame relay but in some case, we use PSTN. The TCP procedure is implemented with different configurations. The networks are used, not only for data collection but also for re-transmission. The terminal equipments are duplicated.
Tanzania: The general status of the meteorological telecommunication networks is good in overall except the leased lines which experience frequent breakdowns.
Chad: Chad NMHS has no telecommunication network, we use ASECNA networks which are not in a good state.
Tunisia: the telecommunication network of Institut Meteorological National of Tunis is composed of two parts: <ul style="list-style-type: none"> - An international part with a leased line at 2400 bpsin X25 with RTH Alger and with a leased digital circuit at 64 kbs with FTP with RTH Toulouse (France) - A national component with 5 specialized lines, a national dissemination circuit via satellite of WAFS data to meteorological airport centres and 5 connection to national network X25 (TUNIPAC)
Uganda: Data collection is through SSBs and we are networked to Global Telecommunication System through VSAT.

b) Which methods/ equipment do you use to collect data from your stations to the NMC?
(Indicate how many stations are concerned with the type of equipment)

SSB radio? Algeria:33 used only as back-up Benin: yes Congo-Brazza: 17 Cote d'Ivoire: 9 Ethiopia: National data from stations is collected through SSB radio. In case of SSB radio failures data is collected through the telephone network La Réunion: no (only backup for 1 station) Gambia: yes (5) Guinea-Bissau: yes Kenya: 17 Libya: yes Mauritius: 3 Niger: yes Senegal: 5 Tanzania:26 stations Chad: yes Tunisia: 0 Uganda: yes, 11 stations
PSTN (telephone network)? Algeria: 74 Benin: no Congo-Brazza: yes Egypt: yes La Réunion: no Gambia: yes (1) Guinea-Bissau: no Kenya: none except when radio is faulty Mauritius: AWS only Senegal: 12 Seychelles OK Tunisia: 21 Uganda: yes, 11 stations
DCP? Benin: no Congo-Brazza: no La Réunion: no Gambia: nil Guinea-Bissau: no Kenya: 10 Mauritius: 1 Senegal: 0 Seychelles OK Tunisia: 0 Uganda: no
VHF, UHF radio? Algeria: 01 Benin: no Congo-Brazza: YES, Camam to Point-Noire. La Réunion: no Gambia: nil Guinea-Bissau: no Kenya: noe Libya: HF radio Mauritius: yes Senegal: 0 Uganda: no
Leased lines? Algeria: 43 Benin: no Congo-Brazza: no Egypt: yes La Réunion:yes (1) Gambia: nil Guinea-Bissau: no Kenya: none Libya: yes Morocco: 18 + 4 (provincial centers) Mauritius: yes Senegal: 0 Spain: all RBSN stations with frame relay Tanzania: 2 stations Tunisia: 2
Internet? Algeria: 0 Benin: no La Réunion: yes (3) Gambia: nil Guinea-Bissau: no Kenya: none Libya: yes Mauritius: yes Senegal: 0 Seychelles OK Chad: yes Tunisia: 0 Uganda: yes
Other? Algeria: Parcel transmission (DZPAC): 32 Benin: PTT telephone (SBB backup) La Réunion: Inmersat/Meteosat yes (5) Guinea-Bissau: no Kenya: VSAT 6 Niger: cell phones with SMS messages Senegal: VSAT 1 Tanzania: GSM Technology (PRIME CELLS) Tunisia: X25, 3 Uganda: yes, VSAT (Entebbe- Nairobi RTH)
Do you operate sub-collecting centres (e.g provincial centres)? Algeria: Yes Benin: no Congo-Brazza: yes Cote d'Ivoire: no Ethiopia: no La Réunion: no Gambia: no Guinea-Bissau: no Kenya: YES. WE OPERATE 4 DATA COLLECTION PLATFORMS (DESIGNATED DATA COLLECTION CENTRES) IN THE COUNTRY Mauritius: no Senegal: no Spain: no Tunisia: yes, 6 regional centres (also AMC) Uganda: no

Additional Comments:

Algeria: 5 regional centres
Congo-Brazza: one RS station has a satellite link with Brazzaville, SBB are fed by elec.generators and batteries. Only 3 stations have solar panel.
Cote d'Ivoire: VSAT is projected for installation
Guinea-Bissau: We need help for SBB for national communication, automated station, a workstation with linux and software to improve our meteorological and telecommunication network.
Morocco: project for using a private virtual network in MPLS
Niger: We plan to generalize usage of cell phones for messages transmission at night time
Senegal: DCP installed since 1991 under EESU-AF are presently broken-down. The mean used most is the telephone, SBB operate in parallel.

c) Which methods/equipment do you use to transmit data to or from your associated RTH?

Leased line: Algeria: Toulouse 64 kB/s, Cairo 64 KB/s, Madrid 2400 kbs, Tunis 2400 Kbs, Casablanca: 50 bs (proect for improvement), Djeddah: 50 bs (IP link in test VPN) Benin: no Egypt: yes Ethiopia: yes 9600 bs La Réunion: yes (frame relay 512 kbs) Gambia: yes 75 bs Guinea-Bissau: no Kenya: yes,9600bps Libya: yes 9600 bs Morocco: 50 in TGR – 64/128 Kbps Mauritius: yes, 128 kbps Tanzania: 9.6 Kbs Tunisia: 2400 kbs
Internet: Algeria: 1, 2Mb/s Benin: no email: Algeria: yes Benin: no ftp: Algeria: Yes Benin: no Ethiopia: yes 28800 bs Gambia: no Guinea-Bissau: email Kenya: yes, 64Kbps Seychelles 256Kbps Uganda: yes, 64 Kbps
VSAT: Algeria: 0 Benin: yes Congo-Brazza: yes, 2400 bps Egypt: yes Gambia: no Guinea-Bissau: no Kenya: yes, 64kbps Niger: yes, 19,2 Kbs Uganda: yes, 120 KBps
Others (specify): Algeria: 0 Congo-Brazza: SBB Cote d'Ivoire: radio teleprinter/CAT Gambia: GTS, MSG Guinea-Bissau: nothing Kenya: TCP/IP, 64 Kbps Niger: terrestrial station IBS 32 Kbs and 64 Kbs Tunisia: Toulouse, 64 Kbs, FTP

d) What are the main telecommunication equipment in your centre (NMC/RTH)?
(Indicate all that apply)

Message switching system: Algeria: yes Benin: AMS 1500 Congo-Brazza: AMS 1500 SAGEM (for alphanumeric data only) Egypt: Messir com La Réunion: yes (TRANSMET with backup) Gambia: nil Kenya: yes Libya: yes Morocco: Transmet (NMC) - MESSIR (provincial centres) Mauritius: yes Senegal: AMS 1500 connected to NMTN and MESSIR-COM tor MTN Spain: dual system, UNIX, C and Java Tanzania: yes Tunisia: Messir-Com- Corobor
MDD, DRS: Algeria: no Benin: no Congo-Brazza: no Cote d'Ivoire: out of order Ethiopia: yes La Réunion: yes (1MDD, 1 DRS/DCP) Gambia: MDD Guinea-Bissau: MDD not in condition Kenya: yes Morocco: yes Mauritius:yes Niger: MDD Senegal: broken-down Seychelles: MDD Tanzania: yes
RETIM: Algeria: yes Benin: no Congo-Brazza: no Egypt: yes 2000 La Réunion: yes Gambia: nil Guinea-Bissau: no Kenya: WILL BE INSTALLED WITHIN THIS FINANCIAL YEAR OF 2005/06 Libya: yes RETIM 200 Europe and RETIM 2000 Africa Morocco: yes Mauritius: yes Senegal: no (in project) Seychelles: RETIM 2000 Tanzania: yes Tunisia: Retim 2000
MSG ground station: Algeria: yes Benin: yes Congo-Brazza: yes Cote d'Ivoire: yes Egypt: yes Ethiopia: yes La Réunion: yes Gambia: yes Guinea-Bissau: yes Kenya: yes Libya: yes Morocco: being installed Mauritius: yes Niger: yes Senegal: yes (PUMA project) Seychelles: MSG 2 Chad: yes Tunisia: yes
HF radio: Algeria: no Benin: no Congo-Brazza: yes Cote d'Ivoire: yes La Réunion: non Gambia: nil Guinea-Bissau: no Kenya: yes Libya: yes Morocco: no Niger: only for SBB transmission Senegal: dissemination RTT (AFMET 5) and radio fax stopped Tanzania: yes Tunisia: no Uganda: yes Uganda: yes
Other (specify): Algeria: SADIS Benin: MESSIR; SADIS; MSG; SIOMA Cote d'Ivoire: radio teleprinter Gambia: SADIS, AFTN Kenya: VSAT terminal equipment Senegal: SADIS 2 ways Seychelles: Transmet
Congo-Brazza: Terminal telex TX35, RIS TX35 SAGE; PC SMT/RSFTA of COROBOR SYSTEMS. Planned to replace telex by PCs. Guinea-Bissau: SBB not operational

Mauritius: TEL/FAX INTERNET

e) Specify the internet facilities operated by your NMC/RTH.

Dial up: Algeria: no Ethiopia: yes 28 kbs Gambia: yes 40kbs Guinea-Bissau: none Libya: yes 9600 bs Mauritius: 56 kbps

Leased line: Algeria: yes, 2Mbs Cote d'Ivoire: 128 KBs Egypt: yes 1MBps La Réunion: yes 512 kbs Guinea-Bissau: no Morocco: yes, 256 Kbps Mauritius: 128 kbps Senegal: yes, 64 kbs Tanzania: yes, 32Kbps Tunisia: 256 Kbs
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VSAT: Algeria: no, Cote d'Ivoire: projected Kenya: yes, Uplink 64 Kbps, downlink 512 Kbps Libya: yes Tanzania: yes, 64 Kbps, Uganda: 128 KBps

Congo-Brazza: Internet not used in operational mode Guinea-Bissau: no

Seychelles: Wireless Internet – 256 Kbps
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f) Please describe the main problems affecting the Meteorological Telecommunication Networks in your country?

Algeria: Occasional perturbations in transmission links

Benin: atmospheric perturbation for SBB, virtual blocking of MEGABOX because of saturation of MoL 2P for VSAT link, saturation of PTT network

Congo-Brazza: lack of reliable communication means and stable energy in some places, cannot follow progress of technology, no contracts between DMN and ASECNA and private partners, high cost of telecom and consumables, commonality with aviation network creates problems and difficulties to have meteorologically interested staff
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Cote d'Ivoire: difficulties at night for radio SBB, equipment frequently broken-down, bad wave propagation for SBB sometimes
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Ethiopia: The main problems that are affecting the national MTN is that the data collection is carried out through SSB radio, and when the radio relays do not function properly data would not be received on timely basis.
--

The Regional offices are not connected with NMC through computerized modern telecommunication systems and communication channels such as VSAT.
--

The dial-up internet facility is not reliable, the speed is very low and in most cases it is difficult to get access. There is only one Internet Service Provider (ISP), i.e. Ethiopian Telecommunication Corporation (ETC).
--

The international leased data line connecting Addis Ababa and RTH Nairobi is has lots of inherent problems. The line speed is very low. The line is digital on Ethiopian side and analogue on Kenyan side.
--

Regulatory issues affecting the telecommunication services. On Ethiopian side the government runs all communications services, while on the Kenyan side it is becoming privatized. Lack of trained manpower on the IT sector to handle problems arising in data communication.
--

Gambia: All the communication equipment were in operation since the early eighties and used to run on diesel generators. As the stock of spare parts ran short, technicians had to resort to cannibalizing some radio sets to keeping others running. This came to a point where nothing could be done anymore. The national telephone grid is yet to reach most of the stations and even where it does, getting funds to connect to the grid as well as pay for the consumption are major constraints.

Guinea-Bissau: has no operational MTN and station network

Kenya: MOST PROBLEMS ARE CAUSED BY THE NATIONAL TELECOMMUNICATION SYSTEM. AT TIMES THERE IS A SHORTAGE OF SPARES FOR THE RADIO NETWORK
Libya: Tripoli-Ageria circuit is not working due to faulty line, Tripoli-Cairo circuit is not working due to faulty line, both circuit are under upgrading
Morocco: access not available, high cost of telecommunications
Mauritius: interference-NIL, Infrastructure- (faculty line), Internet (Virus, low internet speed)
Niger: too old emitter/receiver HF for SBB, insufficient bandwidth, except for satellite reception systems, use of the same network as AFTN and telephone on the same bandwidth
Senegal: NMTN: insufficient budget for acquisition of new means as well as preventive and corrective maintenance, insufficient and not qualified enough staff. RMTN and MTN: congestion due to use of protocol x25 and equipments of multiplexing voice/data (Mol2p)
Seychelles: Bandwidth limitations of our local ISP's
Tanzania: Leased lines are part of our local PTT infrastructure. The general performance of this Infrastructure is poor, therefore has affected the performance of our met Telecommunication networks.
Tunisia: Limited bandwidth for some lines, average quality of service provided by telecommunication operator
Uganda: Obsolete SSB radios, Understaffing of stations, Lack of training opportunities

g) How much funds are allocated annually for operating and improving the telecommunications networks?

Benin: between 2 and 4 millions (CFA francs)
Congo-Brazza: about 2000 \$
Cote d'Ivoire: budget included in SODEXAM, tutor organization
Egypt: 900,000 USD annually
Ethiopia: No annual budget is allocated for improving the telecommunication network.
Gambia: Less than US\$1000 (one thousand United States Dollars)
Guinea-Bissau: nothing
Kenya: KSHS. 20,000,000.00 (TWENTY MILLION KENYA SHILLINGS) ~ US \$ 270,000.00
Morocco: 8.000.000 dhs are allocated to improve telecommunication network in 2005 at DMN
Mauritius: Total annual IT Budget about 10,000 USD
Senegal: difficult to specify because it concerns both aeronautical and meteorological telecommunication networks.
Tanzania: Just enough funds to sustain operations. No adequate funds for improvement of infrastructure
Tunisia: for operation and development of telecommunication network 300,000 US \$
Uganda: 30,000 US \$

h) In your view, what approach would best address the required upgrades in meteorological telecommunication in the region?

Algeria: Installation of MSS in NMCs and satellite links for remote meteorological stations
Benin: training of telecommunication agents, improve met. Comm.. for national collection in time
Cote d'Ivoire: installation of VSAT
Egypt: We will use concentrator for data collection for station automatically
Ethiopia: Modern communication systems can be acquired only through international assistance. WMO in cooperation with the relevant authorities in RA-I should look forward to get the assistances of international satellite and other communication companies to upgrade the obsolete communication system in Africa. The success story of the PUMA project (MSG) must be taken into consideration to address the issue.
Gambia: Connecting to national telephone grid will reduce the dependence on highly sophisticated specialized equipment requiring highly skilled personnel for their maintenance. The move to telephone would shift the burden of maintenance and repairs from the meteorological services budget, as it would be the responsibility of the telephone service provider.
Guinea-Bissau: The developed countries should improve the telecommunication system in RA I according to the WWW plan.
Kenya: USE OF VSAT COMMUNICATION FOR REGIONAL NETWORKS USE OF GPRS (GSM) FOR NATIONAL NETWORK
Morocco: use of Internet for collecting observations at the regional level, create a line between Casablanca and Dakar
Mauritius: Improvement of major communication modes should help, Improvement of communication infrastructure

Congo-Brazza:

A) For national data collection

Inform sufficiently on:

- 1) Systems and telecom. services (DCP, digital radio communications HF, use of shifted VSAT with channels reserved for met.data only in order to obtain a better visibility in data collection and dissemination).
 - 2) exchange and data distribution
- Encourage and help to implement radio links (BREEZNET), allowing for example interconnexion of DMN Brazzaville and Kinshasa to a de Brazzaville RTH;
 - Accelerate implementation or re-habilitation of following point to points circuits:
 - Brazzaville – Nairobi
 - Brazzaville – Pretoria
 - Brazzaville – Sao – Tome
 - Brazzaville – Toulouse
 - Brazzaville – Pretoria
 - Brazzaville – Luanda
 - Brazzaville – Dakar
 - Brazzaville - Niamey
 - Implement in all NMCs and RTH MSS processing all types of met. Data;;
 - Implement FTP servers in all RTH as recommended by WMO;
 - Increase speed of circuits to at least 9600 bps;
 - Encourage interconnection of meteorological systems in NMC/RTH and to Internet ;
 - Take benefit of progress in computer science for operational needs of GTS in Region I and inform on security and separation of traffic between Internet and GTS;
 - Develop web site for RTH;
 - Implement progressively protocol TCP/IP in meteorological data transmission systems;
 - Implement new functionalities linked to amendments to GTS.
- 3) Staff training
 - i. Help training institutions in Region I to develop efficient programmes for telecommunications;
 - ii. Define clear career plan to motivate telecopmmunications staff.;

La Réunion: the solution tested in the Indian Ocean which seems to have the best ratio cost/efficiency consists in coupling a data concentration system through Internet to a data reception system like RETIM Africa or EUMETCAST.

Libya: Tripoli-Cairo circuit, Ageria-Tripoli circuit, Tunisia-Tripoli circuit

Niger: replace SBB emitters/receivers, increase bandwidth or better use independent bandwidth for meteorological communications, make operational use of internet
Senegal: NMTN: use of DCP, Internet, leased lines and system VSAT for national collection, RMTN and RTH: leased lines of VSAT system, TCP/IP protocol and Internet, alphanumeric, graphical and binary MSS, implement Web and FTP server..
Seychelles: A dedicated V-sat up & down link would greatly improve our telecomms
Tanzania: - Coordinated use of modem telecommunication technology regionally such as VSAT - Effective use of Internet
Tunisia: migrate towards advanced techniques (frame relay) and protocol TCP/IP and digital supports with large bandwidth, and mastering of security aspects for the networks
Uganda: use of AWOS for real time data, AMSS

3.3 Data Management

a) What are the data management problems affecting your country?

Algeria: None Benin: national concentration
Congo-Brazza: manual handling of RBSN data, lack of software for all RBSN data
Cote d'Ivoire: A software LOGAM developed by the DMN runs on a single PC for all services and perform different tasks
Egypt: 1-data collection not fully automatic 2-quality control of data is not fully automatic
Ethiopia: - Lack of data communication networks. - The Internet and Communication Technologies (ICT) in the country are not well developed. High-speed internet access is crucial to handle the data management problems. - Regional offices are not automated. - Timely measures needs to taken to address the issue of migration to TDCF. - Lack of basic training on coding and encoding in BUFR and CREX
Gambia: Computer storage capacity, Human Resources
Guinea-Bissau: the main problem is the financial situation in the country.
Kenya: HUGE VOLUMES OF DATA THAT ARE STILL STORED ON PAPER AND HAVE NOT BEEN ENTERED INTO THE DATA BASE AND ALSO NOT BEEN RESCUED TO AVOID POSSIBLE LOSS FROM PAPER DETERORINATION
Mauritius: Non standard data format, lack of IT personnel
Niger: Control always performed manually, in RTH 90% of the agent have no meteorological training
Senegal: Guide on data management for WWW not up to date., unavailability of WEB and FTP server of NMS, no knowledge on binary codes
Seychelles: We do not have an SQL driven data base such as Clysis or Clicom. Data is presently in excel format
Spain: the harmonization for having all the processes using the same source of data.
Tanzania: - Data collection is not automated; Data collected using telephone, SSBs,

SMS, Internet etc
- Delays in receiving data due to poor means of communication
Chad: lack equipment and staff
Tunisia: Weak level of automation, limited archiving capacity, lack staff
Uganda: Lack of funds, Lack of manpower/ human resources, Lack of enough computers, Poor transport / Communication facilities

b) What is your country's level of preparation to migrate to table driven code forms (TDCF: BUFR and/or CREX)?

Algeria: Software being installed Benin: weak Cote d'Ivoire: none Ethiopia: So far no preparation is carried out. Some staff members participate in the Arusha workshop related to TDCF. La Réunion: use of BUFR code is generalized. Gambia: We are not properly informed on this new development Guinea-Bissau: nothing Kenya: FUNDS HAVE BEEN SET ASIDE FOR THE ACQUISITION OF APPROPRIATE HARDWARE AND SOFTWARE Morocco: implementation of a new version of MESSIR for airports, stations and regional centres Mauritius: not yet started Niger: there were two seminars on BUFR and CREX for forecasters and managers of centre and meteorological service Senegal: ZERO Seychelles: No capacities Tanzania: Initial training has been done to 45% of operational staff - CREX template being prepared ready for experimentation Chad: no preparation Tunisia: study running
If your data acquisition system is automated, did you install a BUFR decoder? Algeria: Yes Congo-Brazza: no Cote d'Ivoire: no Egypt: no Ethiopia: It is not automated La Réunion: yes Gambia: no Guinea-Bissau: no Kenya: no Morocco: no Mauritius: not yet Niger: not yet Senegal: no Seychelles: no Spain: yes, but only at central level Tanzania: no Tunisia: yes Uganda: no
Did you nominate a national focal point on Codes matters and migration? Algeria: yes Benin: no Congo-Brazza: no Cote d'Ivoire: no Egypt: no Ethiopia: yes Gambia: no Guinea-Bissau: no Kenya: yes Mauritius: yes Niger: no Senegal: no Seychelles: no Tanzania: yes Chad: no Tunisia: yes Uganda: yes
Do you have a national committee on migration to TDCF? Algeria: no Benin: no Congo-Brazza: no Cote d'Ivoire: no Egypt: no Ethiopia: no Gambia: no Guinea-Bissau: no Kenya: no Morocco: no Mauritius: no Niger: no Senegal: no Seychelles: no Tanzania: yes Chad: no Tunisia: no Uganda: yes
Do you have a national plan for migration to TDCF? Algeria: no Benin: no Congo-Brazza: no Cote d'Ivoire: no Egypt: yes Ethiopia: no Gambia: no Guinea-Bissau: no Kenya: yes Morocco: no Mauritius: no Niger: no Senegal: no Seychelles: no Tanzania: yes Chad: no Tunisia: no Uganda: yes
If not, are you currently developing one? Algeria: yes Benin: no Congo-Brazza: no Cote d'Ivoire: no Ethiopia: We are in the process Gambia: no (We require further guidance) Guinea-Bissau: yes Morocco: yes Mauritius: yes Niger: no Senegal: yes Seychelles: no Chad: no Tunisia: yes

c) What are your needs for (b)?

Algeria: Software module for encoding in BUFR
Benin: training of staff, acquisition of equipment and software

Congo-Brazza: to acquire a system of data acquisition with decoder, more information on TDCF
Cote d'Ivoire: need help for acquire decoding software and display software of SIGWX coded in BUFR
Egypt: 1- software of BUFR decoder 2- Training of our staff 3- Supply us with CREX and implementation of it
Ethiopia: - National trainers to train observers in handling BUFR and CREX. - The national trainers need to be familiarized themselves with BUFR and CREX before they train the national observers who are involved in the routine operational work.
Gambia: <ul style="list-style-type: none"> • Support for encoding and decoding software for the Table Driven Code Forms • Training • Information dissemination from WMO-CBS on TDCFs • Assistance in preparing and implementation of the migration plan • Provision of automated observing system
Guinea-Bissau: to understand BUFR and CREX
Kenya: WE ARE AWAITING GOVERNMENT APPROVAL TO ENABLE US ACQUIRE THE BUFR SYSTEM. WE ALSO NEED EXTENDED TRAINING FOR RELEVANT STAFF
Morocco: management level, direction for the committee
Mauritius: Training of personnel, purchase and installation of necessary equipment
Niger: Develop a plan before 2008, acquire decoding and encoding OPMET system, generalize training on the system
Senegal: Acquire software, install, and begin training and trials
Seychelles: Full support do develop this capacity
Tanzania: We need to complete training of our operational staff and to get aid install a BUFR decoder
Chad: Everything is needed
Tunisia: acquisition of interface software (to decoder), upgrade software of automatic stations, training, improve communication means
Uganda: Funds to conduct training

d) What are the national strategies to address the problems identified in (a) and how much funds are allocated annually for operating and improving the data management facilities?

Algeria: Allocated funds are included in those for telecommunication networks. Benin: need building for archiving data
Congo-Brazza: Increase computer capacities (equipment and software), increase staff
Cote d'Ivoire: implement plan for acquire PCs and data management software
Egypt: 100,000 USD
Ethiopia: So far no budget is allocated to address the issue of TDCF. WMO need to advice the national meteorological services to develop national strategies, to allocate

funds for implementing TDCF and for training purposes. And WMO need to inform national meteorological services to give weight to the migration process so that smooth transition is achieved to BUFR and CREX.
Gambia: As part of the national strategy on improving our database management, we intend to provide an inventory of the database at the end of each year. We also plan to be publishing annual climate summaries. With these we hope to capture attention on our contribution to national welfare and in the process be able to get more attention in the national budget. At present database management gets less than US\$1000 per annum. This is mainly to purchase CDs, paper, cartridges etc
Guinea-Bissau: the national plan is to request help from developed countries. Guinean government has not any national plan to solve the problems.
Kenya: WE HAVE COMMENCED THE DATA RESCUE EFFORTS TO PUT THE DATA AT RISK IN COMPUTER COMPATIBLE MEDIA. THE ALLOCATED FUNDS ARE NOT QUITE SUFFICIENT FOR THE TASKS INVOLVED.
Mauritius: - Not yet addressed, - suggest earlier migration to standard format and to TDCF, - Total annual IT Budget about 1000 USD
Senegal: develop a plan for computerizing the NMS, budget plan and implementation
Seychelles: This NMS has initiated contact with "CLYSIS" owners in France. However, the package is quite expensive. The cost includes the software, the installation and training. A small percent of the budget goes to data management
Tanzania: An upgrade to our AMSS is currently planned. Networking of all meteorological station is being planned. VSAT shall be installed. at zonal offices
Tunisia: Increase staff and equipment

e) In your view, what is the best approach for the region to migrate to table driven codes?

Algeria: Upgrading appropriately equipments, links and training in parallel of staff
Benin: need experts to asses needs in the field
Congo-Brazza: training of 2 staff per country on TDCF and of training institutions, national training event by the 2 trained persons, and report to WMO
Cote d'Ivoire: to have a concerted plan for acquisition of software and computer equipment for all the countries in the Region
Ethiopia: First the Training of trainers at regional centers must be accomplished. National strategies must be developed and the national needs must be identified. Funding for training at national levels must be found. The regional communication network problems should be solved
Gambia: Because of numerous implications associated with the migration to TDCFs, such as program costs, training, RA I should develop a joint migration plan to be implemented by all members. This will ensure timely compliance as well as save resources.
Guinea-Bissau: the international community should intervene to solve all the problems that the RA I is facing.
Kenya: ACQUISITION OF THE RELEVANT HARDWARE AND SOFTWARE FROM ONE SOURCE AS WELL AS REGIONAL TRAINING ON THE NEW SYSTEM
Mauritius: - Capacity building, - network of focal persons to solve trouble shooting

Niger: Increase capacities for implementation and use of TDCF (BUFR;CREX, and even GRIB), Implement regional project for improvement of data management in the Region
Senegal: provide software ready to install, local training, regional seminars and evaluation of operation
Seychelles: Encourage awareness, workshop and provide assistance to countries with no capacities in migration of operational data to table driven codes
Tanzania: Funds should be made available to NMHS which have done TDCF training such that they can offer training to one remaining countries which have not started such training
Tunisia: focal point, committee and working group, specific training, modernization of observations and telecommunications
Uganda: Training all meteorological cadres on TDCF

3.4 Global Data Processing and Forecasting Systems

a) Do you have an automated system for data acquisition and processing?

<p>Algeria: yes Congo-Brazza: no Cote d'Ivoire: no La Réunion: yes Gambia: yes Kenya: yes Libya: No Morocco: yes Mauritius: yes (operational) Niger: MSG. MESSIR Senegal: yes Chad: no Tunisia: yes</p> <p>If Yes: indicate if you have an Observations data base: Algeria: Yes Cote d'Ivoire: no Egypt: yes Ethiopia: no La Réunion: yes Gambia: no Guinea-Bissau: not in function Kenya: yes Morocco: BDM (Meteorological Data Bank) Mauritius: not complete Niger: no Senegal: yes Tunisia: yes Uganda: yes, but still in test</p>
<p>Can you display observations on screen, Surface? Algeria: yes Benin: yes Congo-Brazza: yes Cote d'Ivoire: no Egypt: yes Ethiopia: no La Réunion: yes Gambia: yes Guinea-Bissau: yes Kenya: yes Libya: no Morocco: yes Mauritius: yes Niger: yes Senegal: yes Seychelles: yes Tanzania: no Tunisia: yes Uganda: yes</p> <p>Upper-air?: Algeria: yes Benin: yes (with MSG station) Congo-Brazza: yes Cote d'Ivoire: no Egypt: yes Ethiopia: no La Réunion: yes Gambia: yes Guinea-Bissau: no Kenya: yes Libya: no Morocco: yes Mauritius: yes Niger: yes Senegal: yes Seychelles: yes Tanzania: no Tunisia: yes Uganda: yes</p>
<p>Other?: Algeria: satellites data, radar, soundings, T4, BUFR Benin: yes Cote d'Ivoire: no Egypt: yes Sat images, MDD charts La Réunion: yes (RADAR) Gambia: yes NWP Through MSG receiving equipment/station Guinea-Bissau: no Morocco: yes, using SYNERGIE system Mauritius: yes Noger: yes, model products , T4 charts Tunisia: yes, Radar, satellite, NWP products</p>
<p>Do you apply automatic quality control?: Algeria: no Benin: no Congo-Brazza: no Cote d'Ivoire: no Egypt: yes Ethiopia: no La Réunion: yes Gambia: no Guinea-Bissau: yes Kenya: yes Libya: no Morocco: yes Mauritius: no Niger: no Senegal: no Seychelles: mostly no Tanzania: yes Tunisia: no Uganda: yes</p>
<p>Do you have automatic chart plotting? Algeria: yes Benin: yes Congo-Brazza: no Cote d'Ivoire: no Egypt: yes Ethiopia: no La Réunion: yes Gambia: yes Through MSG receiving equipment/station Guinea-Bissau: no Kenya: yes Libya: yes Morocco: yes Mauritius: no Niger: no Senegal: yes Seychelles: no Tanzania: no Tunisia: yes Uganda: yes</p>
<p>Do you archive observations on computer compatible device(s)? Algeria: yes Benin: yes Congo-Brazza: yes Cote d'Ivoire: yes Egypt: yes Ethiopia: no La Réunion: yes Gambia: yes Guinea-Bissau: yes Kenya: yes but for short period Libya: no Morocco:</p>

yes Mauritius: no Niger: no Senegal: yes Seychelles: no Tanzania: yes for climatological data Tunisia: yes Uganda: yes

b) For your operation, especially nowcasting, do you have access to Radar images? Algeria: yes Benin: non Congo-Brazza: yes, but broken down for 6 months Cote d'Ivoire: yes, but stoped since November 2004 (sabotage) Egypt: no Ethiopia: no La Réunion: yes Gambia: no Guinea-Bissau: no Kenya: yes WILL BE ACCESSING THEM IN THE NEAR FUTURE & COVER THE WHOLE COUNTRY Libya: no Morocco: yes Mauritius: yes Niger: no, radar not operational presently Senegal: yes Seychelles: no Chad: no Tunisia: yes Uganda: yes

If, yes, what percent of your national territory is covered with the meteorological radar? Algeria: 40 % North Congo-Brazza: 45% Cote d'Ivoire: 50% La Réunion: 30% Morocco: 40% Mauritius: only Mauritius Island imagery from Reunion Island (Meteo France) Niger: 2 broken down Radar in Niamey and Zinder cover a small part of the country Senegal: 35% Tanzania: no Tunisia: 30% Uganda: yes, 100% but Radar now unserviceable

Do you receive satellite imagery? Algeria: yes Benin: yes Congo-Brazza: yes Cote d'Ivoire: no, but soon with MSG Egypt: yes Ethiopia: yes La Réunion: yes Gambia: yes Guinea-Bissau: yes Kenya: yes Libya: yes Morocco: yes Mauritius: yes Niger: yes Senegal: yes Seychelles: yes Tanzania: yes Chad: yes Tunisia: yes Uganda: yes

If yes, by which mean (e.g MSG)?: Algeria: Meteosat 7, MSG, NOAA Benin:MSG Congo-Brazza: MSG Egypt: MSG, PDUS Ethiopia: EUMETSAT, MSG La Réunion: direct reception + special link + image received through RETIM Africa Gambia: MSG Guinea-Bissau: MSG Kenya: MSG Libya: MSG Morocco: METEOSAT but not yet MSG Mauritius: MSG, RETIM; METEOSAT; HRPT (NOAA & FY) Niger: MSG, PDUS Senegal: MSG Seychelles: MSG Tanzania: MSG Chad: MSG Tunisia: yMeteosat 7, MSG Uganda: MSG-2 and METEOSAT 7

c) For your forecasting operation, do you have access to NWP products generated by a global models?: Algeria: yes Congo-Brazza: yes Cote d'Ivoire: no but soon through MSG Egypt: yes Ethiopia: yes La Réunion: yes Gambia: yes Guinea-Bissau: yes Kenya: yes Libya: yes Morocco: yes Mauritius: yes Niger: yes Senegal: yes Seychelles: yes Tanzania: yes Chad: yes Tunisia: yes

If yes, from which Centre(s)?: Algeria: ECMWF, LFPW, EGRR, KWBC Benin: WAF, ECMWF Congo-Brazza: Toulouse, ECMWF, Exeter Egypt: ECMWF, EDZW, EGRR,LFPW, NCEP Ethiopia: ECMWF, IRI, NCEP/CPC La Réunion: Toulouse, Exeter, ECMWF Gambia: ECMWF, METEO FRANCE & UK MET OFFICE Kenya: UK MET OFFICE, METEO-FRANCE, ECMWF, COLA, IGES ETC Libya: Meteo-France, ECMWF Morocco: Maroc Meteo (DMN) , Arpege (France), ECMWF Mauritius: ECMWF; UKMO; Toulouse Niger: Toulouse, Bracknell, ECMWF in GRIB or charts in T4 Senegal: Toulouse, DWD, ECMWF, Exeter Seychelles: ECMWF, METEO-FRANCE, ULMO, NCEP, US-NAVY (NOGAPS) Tanzania: NCEP Chad: ECMWF, WAFS (Exeter) Tunisia: ARPEGE, NCEP, ECMWF Uganda: yes, NOAA, CPC (GFS;ETA), UKMO

If yes, by which mean (GTS, MDD, MSG, VSAT, Internet, SADIS, FAX)?: Algeria: GTS, SADIS, RETIM2000, INTERNET Tunisia: Retim 2000, Internet

Benin: MSG and SA

Congo-Brazza: MSG, Internet, SADIS

Cote d'Ivoire: Experimental MSG

Egypt: MDD, MSG, Internet, VSAT
Ethiopia: MSG
La Réunion: special link with Toulouse (frame relay), MDD, RETIM Africa
Gambia: MDD, MSG, SADIS
Guinea-Bissau: Internet
Kenya: MSG, Internet
Libya: MSG, Internet and SADIS
Morocco: MDD, Fax, Internet, RETIM, PDVS
Mauritius: GTS, MDD, MSG, RETIM, Internet
Niger: MSG, SADIS, MDD, MESSIR
Senegal: GTS, MSG, SADIS
Seychelles: GTS, MDD, MSG, Internet, SADIS, RETIM 2000
Tanzania: GTS, MDD, MSG, Internet
Chad: GTS, MSG, SADIS
Uganda: Internet, MSG, VSAT, GTS, SADIS

- d) If the answer in (c) is yes, have products generated by a global model helped improve your national forecasts? Algeria: yes Congo-Brazza: yes Cote d'Ivoire: yes La Réunion: yes Morocco: yes Tunisia: yes Specify how?

Algeria: Global model products are used for analysis and forecasting at synoptic scale, also for LAM initialization, and running a wave prediction model Benin: reliability in forecasting of thunderstorms systems and their movement, hydro and lithometeors
Congo-Brazza: better integration of local systems (squall line, clouds clusters, thunderstorms) in meteorological fields such as: surface pressure, wind, divergence, precipitations, humidity, geopotential and temperature
Cote d'Ivoire: range has increased, vorticity and divergence fields help to improve accuracy
Egypt: 1- The GRIB data is used as a boundary condition data for running the operational model. 2- The GRIB products are important in the weather forecast news for T.V and public
Ethiopia: The model outputs are used for short and mid term forecasting. The 24 hours, weekly and ten-daily weather forecasts are made based on ECMWF model outputs. The actual weather condition at surface, 850 , 700, 500, 300, 200, 100 hPa levels and their future trends are assessed for issuing the weather condition in the country. The skill of the model outputs is found very high and regularly used for operational weather forecasting. In addition seasonal rainfall forecasts are used for long-term weather forecasting.
Gambia: Yes, the global model had helped in improving the skill of our national daily forecast. Model products have helped in offsetting the effects of data scarcity.
Guinea-Bissau: MSG do not function (miss electricity)
Kenya: THEY PROVIDE GOOD GUIDANCE ON THE POSSIBLE SCENARIOS
Libya: by using products generated by a global model, we are able to produce medium-range forecasts

Morocco: Yes, especially for medium range forecasting because our numerical model (Al Bachir) don't provide us forecasting products beyond 72 H so ARPEGE and ECMWF predictions are very helpful for making medium range forecasting
Mauritius: YES Forecast particularly 2-5 days more accurate
Niger: Scores of 24h forecasts of surface wind and temperatures have improved a lot. For aviation, wind and TEMSI charts are of good quality.
Senegal: More accuracy for importance, evolution, speed of phenomenon
Seychelles: NWP has improved forecast particularly for medium to long range forecasting –We have better 4–10 Day Forecast. It has helped meteorologist to understand the complex space and time evolution of the thermodynamics and kinematics in the tropical Indian ocean
Tanzania: The products have helped improve national forecasts. Without these products. The NMHS would be left with the manually plotted/analysed products which are not comparable to the NWP products
Chad: Superposition and assimilation enable good detection of meteorological phenomena
Tunisia: medium-range
Uganda: Yes ,We use WAFCS London & Washington, Meteo-france and NOAA products to compare and make more precise forecasts

e) For your forecasting operation, do you have access to Ensemble Prediction System (EPS) Products generated by a global model? Algeria: yes Congo-Brazza: no Cote d'Ivoire: yes Egypt: no Ethiopia: yes La Réunion: yes Gambia: no Guinea-Bissau: no, MSG do not function Kenya: yes Libya: yes Morocco: yes Mauritius: no Niger: no Senegal: yes Seychelles: yes Tanzania: yes Chad: yes Tunisia: yes Uganda: yes

If yes, from which Centre(s)?: Algeria: US NAVY (NOGAPS), NCEP model Benin: yes, WAFc and ECMWF Cote d'Ivoire: ECMWF La Réunion: ECMWF Kenya: IRI, UK MET OFFICE Libya: Meteo-France Morocco: ARPEGE, ECMWF, GFS, ENS and others Seychelles: UKMO, NCEP, NOGAPS Tanzania: ECMWF Tunisia: ECMWF Uganda: NOAA-CPC

If yes, by which mean (GTS, MDD, MSG, VSAT, Internet, SADIS, FAX)?: Algeria: INTERNET, Benin: MSG, SADIS Cote d'Ivoire: MSG Ethiopia: MDD, MSG La Réunion: Special link with Toulouse (frame relay) Kenya: Interne Libya: MSG and SADIS Morocco: FAX, MDD but mainly by Internet Senegal: GTS, MSG, SADIS, Internet Seychelles: Internet Tanzania: Internet Chad: MSG, SADIS Tunisia: Internet (password) Uganda: Internet, MSG, VSAT

Do you make use of EPS products for your forecasting operation? Algeria: Yes Benin: Yes Cote d'Ivoire: no Egypt: no Ethiopia: yes La Réunion: yes Guinea-Bissau: no Kenya: yes Libya: yes Morocco: yes Mauritius: yes Niger: no Senegal: yes Seychelles: yes Tanzania: to a limited extent Tunisia: yes Uganda: yes

If yes, could you briefly explain how? Algeria: used for medium range forecasting Benin: aerodrome forecasting, TREND, Sig weather charts, warnings Ethiopia: The national forecasts are compared with the EPS products to ensure if the future trends of the weather in our product and the EPS are on the same course. Otherwise the ESB products are used with caution. La Réunion: especially for tropical cyclone forecasting Kenya: COMPARE MAP PATTERNS OF THE EPS PRODUCTS WITH THE NATIONAL OUTLOOKS GENERATED THROUGH EMPIRICAL STATISTICAL MODELS AND DYNAMIC MODELS Libya: for medium-range forecasts Tunisia: rain and wind probabilities

Morocco: Yes, we use Charts of Predicted fields (T;Z;H%Pmes) for ≠ time and level We use also other numerical model product like GFS, ENS, ...
Mauritius: As input for our seasonal outlooks by direct interpretation of seasonal predictions of SST, MSLP, Precipitation
Senegal: Use for making warning for public, assistance to aviation, etc...
Seychelles: Ensemble prediction is used to understand/predict ENSO, Indian Ocean Dipole (IOD) etc. Also such products help when confidence is low
Tanzania: for tropical cyclone forecasting
Chad: assimilation method

- f) For your forecasting operation, do you have access to NWP products generated by regional models?: Algeria: yes Benin: no Congo-Brazza: no Cote d'Ivoire: no Egypt: yes Ethiopia: yes Gambia: no Guinea-Bissau: no Kenya: yes Libya: yes Morocco: yes Mauritius: no Niger: no Senegal: no, but national Tanzania: yes Tunisia: yes Uganda: yes

If yes, from which Centre(s)?: Algeria: ETA-Algeria and several regional models Egypt: Cairo center ,ETA Egyptian Model Ethiopia: DMC (ICPAC)-Nairobi Kenya: INDIAN CENTRE FOR MEDIUM RANGE WEATHER FORECASTING - OUR NMS IS ALSO RUNNING A REGIONAL LIMITED NWP MODEL, HRM FROM DWD, GERMANY Libya: Meteo-France Morocco: Yes, we have our regional model NORAF and our limited area model Al Bachir Seychelles: no Tanzania: India, NCMRWF Tunisia: ETA/MM5 Uganda: CPC(ETA) NOAA
If yes, by which mean (GTS, MDD, VSAT, Internet, FAX)?: Algeria: In LAN for ETA-Algeria, internet for others Egypt: Intranet, directly Ethiopia: Internet Kenya: Internet, GTS Libya: MDD Morocco: Our Internet telecommunication Network Tanzania: Internet Uganda: GTS, MDD, VSAT, Internet

- g) If the answer in (f) is yes, have products generated by regional models helped improve your national forecasts? Algeria: yes Tunisia: yes Specify how?

Algeria: Regional models enable to have more details for small scale, especially MCS (Meso-scale Convective Systems) or for Mediterranean cyclogenesis. For saharian regions, regional models allow to better forecast convective phenomena which affect Hoggar-Tassili(extreme south of Algeria) during ITF northward up lifting and also for sand life cycle and thus make objectively forecast of reduced visibility by sand (sand dust, sand wind, sand storm)
Egypt: 1- preparing five days forecast. 2- Actual observation of cloud 3-preparing SIG weather charts 4-follow up serious phenomena (storm-RS-Fog)
Ethiopia: Some how they are used for model comparison. The skill of the regional models would become less when they are down scaled at national levels. The model outputs are used as secondary source of data in verifying the outputs made by at national levels.
Kenya: YES. THEY CAPTURE THE SMALLER SCALE PATTERNS AND PROVIDE

FINER DETAILS THAT DO NOT APPEAR IN GLOBAL MODEL OUTPUTS
Libya: yes, by using their products for medium-range forecasts
Morocco: It provide us all information useful to make forecasts at any place with highly time and space resolution
Senegal: crucial for the implementation of provoked precipitation project, especially for accurate identification of cloud clusters to be seeded.
Tanzania: The models have improved the daily weather forecast which is currently More than 79%
Tunisia: for specific situations
Uganda: Yes, through timely and improved seasonal forecasts

h) Do you have an automated system for processing meteorological fields?

Algeria: yes PC Pentium IV Benin: no Congo-Brazza: no Cote d'Ivoire: no Egypt: yes Compaq Server, Workstation, PC's Ethiopia: no La Réunion: yes SYNERGIE workstation Gambia: no Guinea-Bissau: no Kenya: n Libya: no Morocco: yes, IBM RS 6000/SP SUN ENTREPRISE 250 (For BDM) Mauritius: no Niger: no Senegal: yes Seychelles: no Tanzania: no Chad: no Tunisia: yes, IBM P series 690
Do you apply any post-processing to NWP products? (e.g. indices calculation, MOS, PPM, Kalman filter, etc...): Algeria: yes Congo-Brazza: no Egypt: yes Ethiopia: no Gambia: no Guinea-Bissau: no Morocco: yes Senegal: yes Tunisia: yes
If yes, specify which post-processing? Algeria: calculation of isentropic potential vorticity (315 and 330 °K), of potential and latent instability indices, based on equivalent potential temperature for different atmospheric layers, of humidity convergence at 1000 and 850, equivalent potential temperature at 1000 and 850, of thicknesses 1000-700, conversion of sand concentration in visibility, of index K, of index TTI Egypt: MOS Morocco: calculation of indices, some derived parameters Senegal: convergence, divergence, temperature, air mass calculation, superposition of parameters fields, etc.. Tunisia: MOS

i) What is the human potential in your country in Numerical Weather Prediction?

For scientists: Algeria: 5 Benin: 7 Cote d'Ivoire: 2 Egypt: 15 experts in the NWP stuffs with variable knowledge base Ethiopia: There are only few meteorologists trained in Numerical Weather Prediction. La Réunion: those of France Gambia: 1 Guinea-Bissau: none Kenya: 4 Libya: MSC, Degree in NWP, Morocco: 6 experts (very good) Mauritius: very little Niger: we think of It Senegal: weak (less than 6 experts) Seychelles: 2 Tanzania: few scientist have been trained on NWP (4) Chad: insufficient Tunisia: 3 Uganda: one scientist is currently undertaking an MSc in NWP at Nairobi University
For IT experts: Algeria: 1 Benin: 0 Cote d'Ivoire: 3 Egypt: 3-5 experts in the NWP requirements Ethiopia: The major problem of our NMC is lack of trained manpower in the IT sector. Trained personnel in the IT sector quite their job frequently because they can get high salaries in other companies. There is high turn over rate in this sector La Réunion: those of France Gambia: 0 Guinea-Bissau: 4 (2 Class I, 2 Class II) Kenya: 1 Libya: nil Morocco: 3 experts (very good) Mauritius: very little Senegal: weak (less than

4 experts) Seychelles: 0 Tanzania: there is 1 qualified IT expert Chad: insufficient Tunisia: 2

j) What is the computer capacity in your country for the implementation of operational Numerical Weather Prediction? Congo-Brazza: 0 Cote d'Ivoire: 0 Ethiopia: Very limited. We have desk top computers only Seychelles: none Chad: none

Hardware?: Algeria: PC Pentium IV , 2.4 GHz, LINUX, GRADS, VIS5d Egypt: ?server, Unix, linux, models GHZ/S (1.8x4),2.8GHZ/s Gambia: 80 GB, 30 GHz, Window XP professional, MESSIR VISION Guinea-Bissau: MSG, MESSIR VISION Kenya: Dell 300, 800 MHz, Linux, Foratran, Grads, VIS5D Morocco: IBM RS 6000/SP, 54 Gflops, AIX 5.1 Mauritius: PC's, 3GHz (Pentium IV), LINUX Seychelles: none Tunisia: 35.1 Gflops, AIX 5.1, ALADIN, Uganda: 3.0 Ghz

Do you have the necessary connection for boundary conditions acquisition (to run a limited area model)? Algeria: Yes Benin: no Egypt Morocco: yse Mauritius: yes Tanzania: yes Tunisia: yes

If yes, specify: Algeria: Internet: 2Mbs, GTS Egypt: FTP from NCEP for the WAFS data Kenya: GTS, Internet Morocco: 128 Mbps leased line with Toulouse Mauritius: leased line, internet, ADSL Tanzania: VSAT connection at 64 Kbps Tunisia: Leased line 64 Kbs, Internet

k) Does your NMHS operationally run NWP model(s)? Algeria: Yes Congo-Brazza: no Cote d'Ivoire: no Egypt: Yes Ethiopia: no Gambia: no Guinea-Bissau: no Kenya: yes Libya: No Morocco: yes Mauritius: no Niger: no Senegal: yes Seychelles: no Tanzania: no, but is preparing to run ETA model Chad: no Tunisia: yes Uganda: no

l) If the answer in (k) is yes, which NWP model do you run?

Algeria: ETA, WAM Egypt: WS-ETA NCEP ETA, MM5 and RegCM Kenya: HIGH RESOLUTION MODEL (HRM) FROM DEUTCHE WETTERDIEST (DWD), GERMANY CUSTOMISED FOR THE REGION Morocco: ALADIN MAROC and ALADIN NORAF Senegal: HRM (DWD), ETA Tunisia: ALADIN

Do you use your observation data bank for verification and statistical post-processing? Algeria: yes Gambia: yes Guinea-Bissau: yes Kenya: yes Morocco: yes Tunisia: yes

Can you nicely display the model fields? Algeria: yes Egypt: yes Gambia: no Guinea-Bissau: no Kenya: yes Morocco: yes Tunisia: yes

Do you have a field data bank? Algeria: yes Egypt: no Gambia: no Guinea-Bissau: yes Kenya: yes Morocco: yes Tunisia: no, but yes for files of boundary conditions

Can you easily retrieve archived fields? Algeria: yes Egypt: no Gambia: no Guinea-Bissau: yes Kenya: yes Morocco: yes Tunisia: no, but yes for files of boundary conditions

- m) How much funds are allocated annually for operating and improving the data processing and forecasting systems? Cote d'Ivoire: not available because of common budget Egypt: variable Ethiopia: No funds are allocated Gambia: Around US\$7000 (seven thousand United States Dollars) Guinea-Bissau: nothing Kenya: US \$ 50.000 Morocco: about 122000 Euros (maintenance of the IBM) Mauritius: total IT budget about 10,000 US \$ Seychelles: less than 30,000 US \$ Tanzania: mainly enough for operational functions Chad: no money; funds to be sought for Tunisia: 300,000 to 400,000 US \$
- n) What are the major hindrances in your NMHS for the full utilization of the advances in the NWP?

Benin: Miss appropriate equipment, regional model, qualified staff for data processing
Congo-Brazza: scientific and computer staff non-existing or with low qualification, lack of modern telecommunications and computer equipment
Cote d'Ivoire: few staff qualified in NWP, lack of equipment for NWP
Egypt: 1- the computational tools 2- the local connections on the national level.
Ethiopia: - Lack of trained manpower - lack of high speed computer facilities - the local area network (LAN) is not established for accessing the archived data. - Lack global network facilities due to low speed and incompatibility of telecommunication systems
Gambia: <ul style="list-style-type: none"> • Lack of adequately trained staff in sufficient numbers • Poor skills to interpret NWP products • Lack of sufficient funds for consumables
Guinea-Bissau: Capacity building, present conditions, lack of means
Kenya: LACK OF SUFFICIENT RESOURCES TO ACQUIRE THE STATE OF THE ART SYSTEMS AND UPGRADE THE EXISTING ONES, INSUFFICIENT HUMAN RESOURCE
Morocco: Access to Radiance Data (TOVS) to use it in our Data Assimilation A more powerful computer to run AROME (~ 5 km of resolution)
Mauritius: lack of trained personnel
Niger: Data acquisition means are weak
Senegal: Difficult to say because more than 80 % of activities are still manual.
Seychelles: Lack of Human Resources with specialization in NWP Lack of computer and IT specialist
Tanzania: lack of software (compilers) and computing capacity

Chad: lack qualified staff
Tunisia: reduced staff, needed scientific and technical training, calculation power, interface with forecasters
Uganda: Equipment, Manpower

o) In your view, what should be the national strategies to address the problems identified in (n)?

Benin: implement regional WG with expertise
Congo-Brazza: training of scientific and computer staff, acquisition of computers, organization of training seminar using regional training centres, develop regional numerical models
Cote d'Ivoire: training of experts in NWP, acquisition of necessary data processing and forecasting equipments
Egypt: 1-increasing the required fund for upgrading the computational resource. 2-upgrading the local network resource 3-increasing the international experience exchange.
Ethiopia: - Assessing the national needs. - Identifying the needs and looking for donor support for manpower training and acquisition of the high-speed computers. - WMO's assistance in acquiring donor's support is very important
Gambia: <ul style="list-style-type: none"> • Building the requisite human capacity to standard and in appropriate numbers • Provide environment for continuous building of capacity • Provision of appropriate equipment and running costs.
Guinea-Bissau: financial problem of the country
Kenya: TRANSFORMATION OF KMD TO AN AUTONOMOUS AGENCY, HUMAN RESOURCE DEVELOPMENT
Morocco: More funds, Increase the human potential
Mauritius: capacity building
Senegal: study and implement a project for NWP with accent on training of experts and acquisition of hardware and software for NWP.
Seychelles: Encourage students to study meteorology Provide incentives/benefits for specialization in NWP Identify staff with potentials and encourage their attachment to know established NWP Centers
Tanzania: obtain funds to procure computers and software
Chad: training for 2 forecasters and one technician
Tunisia: reinforce basic training and international cooperation, open nNMHS Tunis to university environment
Uganda: Training in MSc in NWP, Acquisition of relevant equipment

p) What would you propose as the best way to improve the capacities in GDPFS in Africa?

Algeria: Creation of regional NWP Centres
Benin: develop telecommunication system with advanced technology (optical fiber)
Congo-Brazza: Re-enforce capacities of ACMAD and RSMC for NWP, related to telecommunications and computers, with qualified experts, facilitate technological transfer (Experts, hardware, software and equipments, etc.), promote research and development in these centres, promote training activities in these centres for telecommunications, computer technology, modelling, interpretation of NWP products, new techniques for information and communication, Geographical Information System (GIS), Increase archiving capacities for national and regional digital data bases
Cote d'Ivoire: training of staff, acquisition of equipment and improving network
Egypt: 1-organizing African meeting to study the needs of their nations for capacity building 2-making plan for development and support on the African level specially after the noticeable decrease in the fund required for construction of NWP center
Ethiopia: - Improving the cooperation between NMCs in the region. - Assistance from the International community and non-governmental organizations. - Capacity building through bilateral and multilateral cooperation and assistance from WMO. - The assistance of developed countries must be acquired through VCP assistance. - In the IT sector and in making available the technical facilities, equipment and materials the leading role of WMO is crucial to solve the problems.
Guinea-Bissau: Have no proposition
Kenya: CAPACITY BUILDING, SHARING OF EXPERIENCES THROUGH ATTACHMENTS, ENCOURAGE RESEARCH AND DEVELOPMENT
Morocco: A political commitment to enhance Meteorological Services, more funds, improve the manpower (training)
Mauritius: - further improvement in capacity building, - upgrade of infrastructure
Niger: Integrate all the facilities of the region for GDPFS and equip regional, sub-regional institutions and NMCs with research means for applications of weather and climate forecasts – Improve RSMCs capacities for having high speed workstations or PC cluster and server for running NWP and climate prediction – Improve telecommunication means and Internet in NMHS to access products of Global producing centres
Senegal: Re-enforce capacities of staff experts in GDPFS from NMHS, which must be given the equipment and the software.
Seychelles: Encourage NWP training at PHD, MSC level (scholarship) Encourage regional training over a longer time period (1-3 months) Advance centers in collaboration with WMO assist country members to initiate and sustain capacities in GDPFS.
<ul style="list-style-type: none"> Tanzania: Assist NMHSs obtain funds to acquire infrastructure and software Improve Human resources capacity building for NWP
Chad: Synergie in NMHS

Tunisia: consolidation of cooperation at the whole Africa level, upgrade NMHS in Africa, expert staff and equipments, improve telecommunication centres and observations systems
Uganda: offer training and equipment

3.5 Public Weather Services Programme

a) What is the status of implementation of Public Weather Services Programme (PWSP) in your country?

Algeria: Implementation of structures to adapt and ensure assistance to different users of public sectors, of conventions with different organizations in charge of civil security, conventions with media (TV, radio, newspapers), contribution to locust fight, re-enforcing NMHS technical capacities, dissemination of various meteorological information on NMS web site, visits by schools and university students
Benin: being experimented
Congo-Brazza: satisfactory
Cote d'Ivoire: periodic bulletins, forecasts on TV broadcast and in press media and personalized meteorological assistance
Egypt: Different media (T.V, Radio, News paper, internet, telephone)
Ethiopia: - The national PWS is carried out through the public medias such as radio, TV and newspaper. The 24 weather forecasts is presented through the national TV once a day, It is also transmitted via the national radio on daily basis. All the major government newspapers publish the 24 hour weather assessments and forecasts. - A weekly weather advisory id disseminated once a week through the national radio. - Educational tours to students are carried out regularly. - Seasonal weather forecast are disseminated to regional offices so that the forecast would be made available to farmers. NMA also posts relevant weather information on its web page
Gambia: not satisfactory
Guinea-Bissau: Miss electricity, MSG does not work which prevents guaranty of products
Kenya: FAIRLY ADVANCED LEVEL OF IMPLEMENTATION
Libya: good
Mauritius: Already ongoing but needs improvement
Niger: Meteorological services for the public are made only during the rainy season (June-September) through TV and radio bulletins – An agro-hydro-meteorological decadal bulletin is also produced during that period. It is prepared by a multi-disciplinary working group
Senegal: satisfactory enough
Seychelles: fairly good
Tanzania: The NMHS has established a section dedicated for implementation of public weather services
Chad: just acceptable
Tunisia: vocal server, web site, SMS messages, Radio, TV and press bulletins, warning bulletins, answering queries

Uganda: Public weather is e-mailed or faxed to Radio Stations and TV presentations is also in Place except that now studio equipment is faulty.

b) What are the capacities of PWSP facilities and human resource in your country?

Algeria: resources come form NMS budget which are mainly State subsidies
Benin: to be defined
Congo-Brazza: 3 PCs of MSG station of PUMA, limited team of forecasters
Cote d'Ivoire: aeronautical forecasts provided by ASECNA, for general public by DMN, equipment: SADIS, MSG, PDUS, staff: 12 meteorological "ingénieurs"
Egypt: 1- Daily forecasting for different media 2- Warning in case of bad weather 3-lot of facilities in our country 4-different issues of forecasting for different sectors
Ethiopia: There is one TV studio at our NMC for preparing the weather forecast. In terms of human resources there is lack of trained manpower in the field. There is a need for capacity building to make full advantage of the PWSP at all levels
Gambia: PWSP facilities are very good but human resources are lacking. Currently only a 24-hour forecast and seasonal outlook are produced.
Guinea-Bissau: it is very important in many areas in our country
Kenya: ABOUT 10 TRAINED WEATHER TV & RADIO PRESENTATION METEOROLOGISTS. TWO WEATHER PRESENTATION STUDIOS WE ALSO CARRY OUT TRAINING ON TV WEATHER PRESENTATION FOR KENYA AND OTHER COUNTRIES
Libya: Using Synergie system and MSG, The human resources are good, but they need to be trained in specialized courses
Mauritius: - Briefing is provided by met personnel to the media (electronic and print) who make the presentation
Niger: Forecasters from the airport produce the bulletin disseminated nationally.
Senegal: 3 ingenieurs, two superior technicians and 2 technical assistants are in charge of PWS in Senegal.
Seychelles: Facilities Good Human Resources – Need specialized human resources. Presently the office is staffed with only 2 post graduates. There are 6-7 Diploma Level Meteorologists and No graduates in IT/Computer Sciences.
Tanzania: Have media equipment and our studio with facilities (PCs and recorders) for production of Weather Presentation for TV and other public media. Human resources are not yet adequate to fully meet the demands of users
Chad: insufficient
Tunisia: 15 engineers and 8 technicians
Uganda: Human resource is capable but facilities still insufficient or lacking

c) What are the most prominent issues affecting the PWSP in your country?

Benin: organistion structure, absence of implication of partners

Congo-Brazza: insufficient or not qualified enough staff, weak communication means (internet especially), weakness of network activity between information producers and final users.
Cote d'Ivoire: lack of data processing and data management, little staff and not specialized
Egypt: All kinds of media
Ethiopia: - Lack of cooperation between sectors addressing the safety of life and property. - Inadequate media network. - Coordination between disaster management services is very weak, - Poor communication networks in disseminating information and products to users - Lack of awareness among the stakeholders Lack of necessary facilities to prepare and disseminate weather information to the public at large
Gambia: <ul style="list-style-type: none"> • Acute shortage of human resources • Inadequate resources for communicating forecast to media houses • Inadequate cooperation with media houses • Due to the non-targeting of users as well as the poor frequency in providing updated forecasts, among other things, the public seems to lack confidence in the product.
Guinea-Bissau: no electricity and lack of recording studio
Kenya: MEDIA HOUSES SOURCING FOR INFORMATION FROM THE INTERNET AND NOT INDICATING THAT SOURCE. THE FORECASTS FROM THESE SOURCES ARE AT TIMES HIGHLY INACCURATE BUT THE PUBLIC BELIEVES THAT KMD IS THE SOURCE
Libya: telecommunications
Mauritius: Need improvement in presentation skill and language
Niger: the meteorological bulletin is recorded 3 or 5 hours before its diffusion. We lack means for producing such a bulletin in national television studios. Lack of forecasters expert in the production and presentation of such bulletin.
Senegal: Maintenance of studio provided by UKMO in good function, difficulty of communications between NMHS and activity centres, availability of products for providing services.
Seychelles: Lack of specialized Human Resources Lack of resources (financial) Lack of public confidence in forecast Lack of public understanding of the various products etc.
Tanzania: Meeting users requirements in terms of quality and timely disseminated Products as well as public education to understand terminologies used and the issue of early warning against severe weather and extreme climate events
Chad: irregular dissemination of meteorological bulletins for public on Radio and TV, lack of means
Tunisia: lack staff expert in communication and information, training in this field,

limited technical means
Uganda: Transfer of the finished product to the end user, especially through Television

d) What impact has the PWSP had in your country?

Algeria: Contribute to improve information for the public
Benin: need financial and technical support
Congo-Brazza: use of meteorological and climatological data in the decision process, for planning, sustainable development, fight against poverty, natural disasters prevention, environment protection, etc..
Cote d'Ivoire: public starts to show some interest in meteorology because of awareness campaign performed for some years
Egypt: We have no problems with PWSP
Ethiopia: The forecasts and warnings disseminated helped the farming community for planning the sowing and harvesting activities and for maximizing their farm outputs. The farmers would also receive weather advisories, which would affect their crops in the field and on flooding conditions. The weather information also indispensably important for early warning provisions particularly to monitor disasters related to health and public safety
Gambia: <ul style="list-style-type: none"> • Better understanding by the public of the capabilities of our National Meteorological Services • Improve safety of life and properties and the general welfare and convenience of the people
Guinea-Bissau: no dissemination of information
Kenya: HIGH IMPACT. THE PUBLIC AND SPECIALIZED USERS CONSULT KMD FOR INFORMATION AND PREDICTIONS MORE THAN THEY USED TO BEFORE THE ESTABLISHMENT OF THE PWSP. THE PWSP HAS THEREFORE HELPED TO ENHANCE THE IMAGE AND VISIBILITY OF THE NMS
Libya: good
Mauritius: - Increase public awareness of high impact weather - Public's trust in met services have increased
Niger: The televised bulletin is well appreciated by the public; the decadal bulletin presents the agro-meteorological, hydrological, phytosanitaire, food, flock and crops situation based on the past.
Senegal: It is a must for the national community.
Seychelles: It has helped public to understand the different products and forecast available Few use PWSP in the decision makings Excellent platform/component in the early warning system
Tanzania: The public has is progressively understanding the products issued through Public awareness programmes
Chad: positive impact
Tunisia: protection of life and properties, improvement of life quality, contribution to development

Uganda: Majority are aware of the importance of weather services to social-economic and Political activities

e) Which sectors regularly use the PWSP products in your country?

Algeria: Civil Public security, socio-economical, medias
Benin: hotels, medias, agriculture, aviation, research, university, marine, transport, habitat
Congo-Brazza: agriculture, energy, Water and forest department, hydrology, FAO, public works and buildings, university, Environment, etc..
Cote d'Ivoire: aviation, agriculture, public works and buildins, environment, hydro-electricity, commerce, tourism
Egypt: 1- tourism companies 2- traffic authority 3-petroleum companies 4-fishermen 5-instruction companies
Ethiopia: The farming community is the primary user of the PWSP products. Also, disaster prevention and preparedness sectors, Aid and development agencies and policy makers
Gambia: General Public, Agriculture, Construction, Tourism
Guinea-Bissau: aviation, construction, fisheries, sports , media, etc., not agriculture
Kenya: THE GENERAL PUBLIC; FARMING COMMUNITIES; RECREATION & TOURISM; THE DISASTER MANAGEMENT SECTOR; AGRICULTURE & FOOD SECURITY; FORESTRY; ENERGY; HEALTH; WATER RESOURCES MANAGEMENT; AND MEDIA AMONG OTHERS
Libya: TV and radio stations, Electricity Company, General Post & Telecommunication Company, etc
Mauritius: General public and all socio-economic sectors
Niger: general public show great interest for knowing the meteorological situation and daily precipitation. Other specialized sectors and international institutions receive regularly the decadal bulletin.
Senegal: transports(maritime, road, aviation), fisheries, agriculture, sports and leisures
Seychelles: Environment – Disaster and risk management secretariat, Hotels, coast guard.
Tanzania: Disaster Management, Agricultural Sector, Water Sector, Hydropower energy sector, Health, Transport
Chad: Agriculture, health, environment, mines, energy, oil and some NGO
Tunisia: medi, tourism, agriculture, sport, transport, energy, public works, insurance, university,/research centres, leisure
Uganda: Agriculture, Aviation, Works, Housing and Construction, Tourism, Environment & National Environment Management Authority, Forestry, Health, Media, sports, Industry and Manufacturing

f) If not all relevant sectors, what are the reasons for non-use of weather and climate information?

Congo-Brazza: weakness of network between producers of meteorological

information and final users, lack of financial means to implement this network, weakness of capacities to disseminate warnings and forecast because of absence of a structured and matured alert system
Cote d'Ivoire: lack of marketing policy
Ethiopia: - Lack of proper understanding about the impacts of weather and climate. - Lack of communication systems
Gambia: Lack of detailed information required by specific sector(s) Lack of updates even if predicted weather deviates significantly Basic understanding of weather processes by nationals is a major constraint
Guinea-Bissau: no electricity, no recording studio
Kenya: LACK OF KNOWLEDGE & AWARENESS OF THE EXISTENCE OF THE SERVICES AND HOW TO APPLY METEOROLOGICAL INFORMATION. INSUFFICIENT CONFIDENCE IN THE ACCURACY OF THE PREDICTIONS
Niger: In general, it is mostly the precipitation situation which interest mostly (public and specialized institutions, for the other seasons, in particular, heat period, the information on the evolution of temperatures is exploited by specialized sectors, which have a specific interest..
Seychelles: Lack of awareness of the profits it can bring. Lack of confidence in the product.
Tanzania: Lack of adequate understanding of the usefulness of available products to The sectors involved
Tunisia: lack of communication and vulgarization
Uganda: Some sectors complain of the language used like Normal or above normal, showers- And thunderstorms

g) What are the national strategies for addressing these problems including the enhancement of PWSP?

Algeria: information actions towards decision makers, teach pupils on meteorology, re-enforcement of commitments towards public services, civil protection and medias, multiply exhibitions, open doors days, modernization of NMS
Benin: no approach for the time
Congo-Brazza: re-enforce work as network, human, hardware and computer capacities of NMHSs, train, educate and increase public awareness of impacts of meteorological factors on socio-economical life and environment protection.
Cote d'Ivoire: training and specialization of staff for developing appropriate products of interest for users, reinforce production and marketing capacities
Ethiopia: - Conducting educational tours to the user community. - Knowledge transfer through workshops and conferences. - Guidance to the farmers at root levels through extension workers. - Educating the public through radio and TV about the impacts of weather and climate. - Decentralizing the weather services to the regional level

- Upgrading public weather service facilities by upgrading the necessary equipments
Gambia: Attempting to target specific users
Guinea-Bissau: we gave a budget to our Minister for the problems: recording studio, electricity, etc..
Kenya: CARRYING OUT AWARENESS CAMPAIGNS TO EDUCATE USERS INSTITUTIONS, THE PUBLIC AND POLICY/DECISION MAKERS THROUGH THE MEDIA, BILLBOARDS, WORKSHOPS AND THE RANET PROJECT CONTINUOUS ENHANCEMENT OF DATA OBSERVATION NETWORK AND WEATHER PREDICTION AND DISSEMINATION SYSTEMS TO IMPROVE ACCURACY AND TIMELINESS OF WEATHER & CLIMATE FORECASTS
Libya: Using new technology (NWP)
Mauritius: Build intersectoral partnership
Senegal: Authorities have asked for a restructuration of NMHS to make a strong Agency able to face all requirements for PWS.
Tanzania: The Agency is seeking for more funds from the government in order to address Some of these problems
Tunisia: intensify participation of INM in different public events, implement structure in INM to deal with information and communication, increase link with media.
Uganda: Working with the media and sensitizing users through workshops and school

h) What are the national strategies to address the problems identified in (c) and how much funds are allocated annually for operating and improving the PWSP facilities?

Algeria: implement new technologies, new methods of dissemination towards the public, implement methodology to determine the real needs of users and decision-makers, train users and decision-makers, re-enforce human capacities and equipment for now-casting
Congo-Brazza: training of staff, acquisition of telecommunications and data processing means, favour work in network.
Cote d'Ivoire: acquisition of computers, training of staff with specialization in different application fields, associate users, local authorities and structures of state
Ethiopia: So far no special funds are allocated for improving the PWSP facilities.
Gambia: Training more forecasting staff Improving cooperation with media houses and intermediaries (extension workers)
Guinea-Bissau: no funds available
Kenya: DEVELOPMENT OF HIGH QUALITY AND TIMELY PRODUCTS THAT ARE PACKAGED FOR SECTOR-SPECIFIC UTILIZATION IN CONFORMITY WITH THE STAKE HOLDERS (USERS) EXPECTATIONS AND MARKETING THEM THROUGH THE MEDIA CARRYING OUT MEDIA TRAINING ON ASPECTS OF FORECAST INTERPRETATION AND ALSO CLIMATE SCIENTISTS ON COMMUNICATION OF CLIMATE INFORMATION TO ASSIST IN REACHING A WIDER POPULATION IN AWARENESS CAMPAIGNS, FUNDING IS ABOUT US \$ 55,000.00 ANNUALLY
Mauritius: Total annual IT budget about 10,000 USD
Niger: Enormous financial, human and technological means are necessary
Senegal: Reinforce cooperation with WMO, reinforce bilateral cooperation and

multilateral for increase material means, software and training, use all national resources for modernization.
Seychelles: Since 2002 we have increased our capacities to deliver weather and climate products to all stakeholders and decision makers and media outlets under the umbrella of the CLIPS programme. The other problems will be addressed under the various international programs. However, locally the early warning , disaster and risk management will be the platform to help overcome the stated problems.
Tanzania: Obtain funds to develop and implement awareness campaign and educational Programmes for the public. Deploy more staff to implement the programmes. There re just enough funds for operating PWS but little for improvement of facilities.
Chad: funds to be increased
Tunisia: Recruitment of specialized staff in communication and information, modernization and implement new structures, 35000 US \$

i) What would you propose as the best method for enhancing PWSP in the region?

Algeria: multiply exchanges of experience between countries, organize regional seminars
Congo-Brazza: constant exchange of expertise in the sub-region, training
Cote d'Ivoire: basic training and specialization of staff in meteorological observations, data processing, analysis, maintenance, dissemination and marketing , acquisition of equipment for observation, data collection systems, processing systems, analysis and meteorological communication
Ethiopia: - Capacity building for improving the PWSP services. - Knowledge transfer on weather and climate activities. - Cooperation with the governmental non-governmental and private disaster management organizations. - Developing partnership with the national and international medias. - Enhancing the communication facilities by acquiring modern information technologies
La Réunion: to encourage development of plans for disaster prevention and national aid adapted to local culture and state of scientific knowledge and ensure their application.
Gambia: Enhance capacity building of NMHS staff Enhance the capacity of ACMAD to be providing forecasts/outlooks for the entire African region Forum for sharing success stories
Guinea-Bissau: data and information sharing with regular capacity building
Kenya: SUPPORT OF CAPACITY BUILDING OF PERSONNEL IN NMSs SUPPORT IN DEVELOPMENT OF FACILITIES ESTABLISHMENT AND STRENGTHENING OD MEDIA / METEOROLOGISTS NETWORKING
Libya: Bilateral cooperation between countries in exchanging data
Mauritius: - capacity Building, - Upgrade infrastructure , equipments - More graphics
Niger: Capacity building, acquisition of studios

Senegal: Reinforce capacities of staff for the PWS, enable access to EPS products, provide forecast products for national communities, reinforce means of centres for hardware and software.
Seychelles: WMO, IOC continue to support existing program such as CLIPS
Tanzania: Develop capacity building for the NMHSs to educate public on the PWSs Address NMHSs problems of infrastructure regionally
Chad: provide some stations with performing instruments to confirm MSG data
Tunisia: qualified staff in NMCs, training of meteorologist for communication and information, special budget for this sector, awareness campaigns
Uganda: Incorporating media in disseminating weather information. Increased use of facilities like RANET to reach more rural communities.

3.6 Any other relevant suggestions

Please provide any other suggestions for the improvement of WWW facilities not covered in the previous sections.

Cote d'Ivoire: favor frequent visits of observation networks, create new meteorological stations
Niger: Re-activate WG on PIW in Africa
Senegal: re-activate (re- dynamize) regional office of WMO for Africa, experts made available and implementation of programmes for improving WWW in Africa.
Seychelles: Yes, time for action. There are many programmes such as the SWIO tropical cyclone committee with various plans and recommended actions to tackle fairly same issues. It is suggested that these recommended priority activities are supported and implemented
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