The National Meteorological Agency of MALI (MALI-METEO) Presentation

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Workshop on enhancing systematic observation and related capacity, especially in developing countries, to support preparedness and adaptation in a changing climate in Bonn, Germany

MALI-METEO AND THE CHALLENGE OF ENHANCING SYSTEMATIC OBSERVATION AND RELATED CAPACITY

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National Meteorological Agency of MALI (MALI-METEO)

- THE NATIONAL AGENCY OF METEOROLOGY (MALI-METEO)
- WEATHER NETWORK OBSERVATION
- IMPACT OF CLIMATE CHANGE ON THE AVERAGE ANNUAL RAINFALL IN MALI
- CHALLENGE

GEOGRAPHICAL LOCATION

Mali is in West Arica, located southwest of Alegria, in to the Sudanian savanna zone. Mali's size is **1, 240,192** square kilometers.

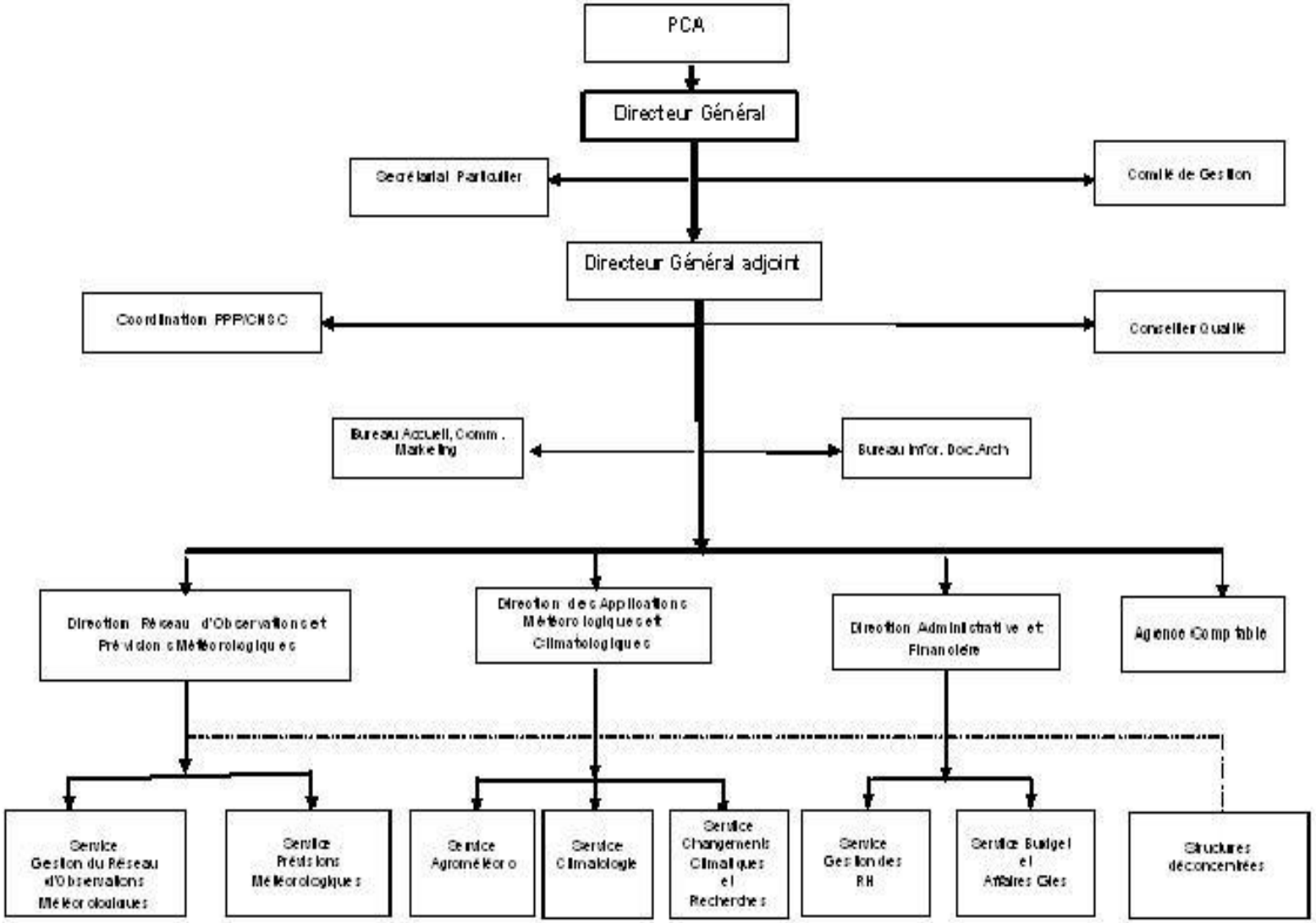
Desert or semi-desert covers about 65 percent of Mali's area.

The population: 15 million.

IONALE AGENCY OF METEOROLOGY (MALI-ME

MALI-METEO is a financially autonomous parastatal agency created in November 2012 in place of the National Directorate of Meteorology in the Ministry of Infrastructure and Transport. With this new legal status, MALI-METEO is required and empowered to raise its own financial resources from both the public and private sectors. The young agency confronts numerous challenges to meet its mandate of providing reliable and timely weather-water-climate information and analysis to a wide range of public and private information users.

ORGANIGRAMME DE L'AGENCE NATIONALE DE LA METEOROLOGIE MALI-METEO



MALI-METEO IS ORGANIZED UNDER SEVEN HEADINGS

- Collecting observational data: maintaining and collecting data from radar stations, synoptic station agro climatic stations, auxiliary agro-climatic stations, and observation posts (214 posts).
- Receiving data from other institutions: satellite data and weather numerical information from other meteorological centers;
- Meteorological services: providing weather data and forecasting, agro-climatic analysis, and weather alerts;
- Running the agro-meteorological advisory program, which provides information to rural users;
- Providing data for climate change modeling and for conducting analysis;
- Conducting the Precipitation Enhancement Program, which seeds clouds to induce rain;
- Additional specialized services.

WEATHER NETWORK OSERVATION

Four (4) Radar Stations: three functional and Gao's radar completely destroyed by the North crisis. It is used during the rainy season for the Artificial Rain Program

Nineteen (19) Synoptic Stations: six no functional (North crisis)

Nineteen (19) Principle Agro-Climatic Stations; seven no functional (North crisis)

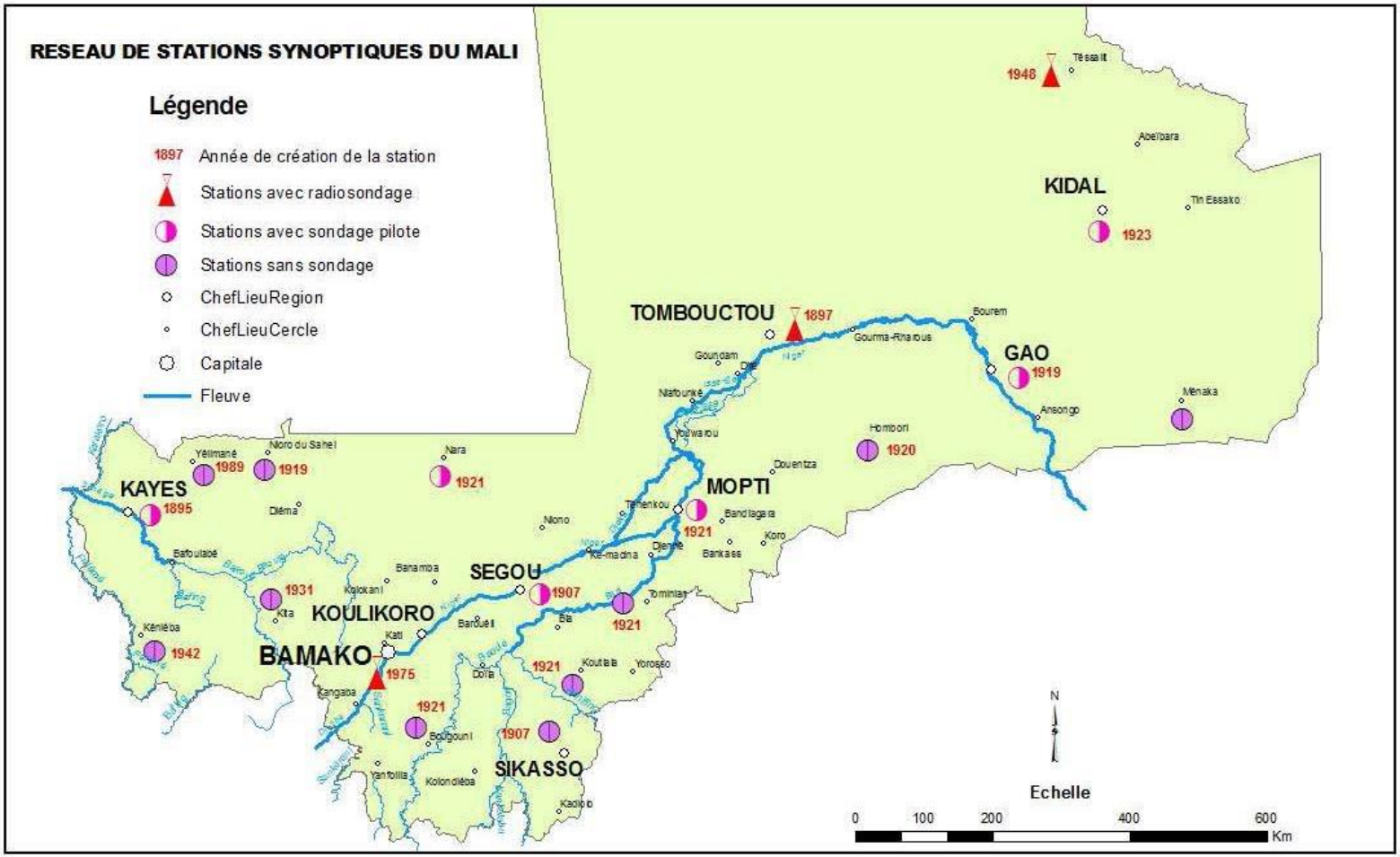
Thirty-five(35) Auxiliary Agro-Climatic Stations; Most of which have been reduced to the rainfall stations

214 Rainfall stations

First weather observation in Mali

1895 (Kayes), 1897 (Tombouctou), 1900 (Nioro du Sahel), 1906 (Ségou et Sikasso) et 1921(Bandiagara)

LOCATION OF SYNOPTIC STATIONS

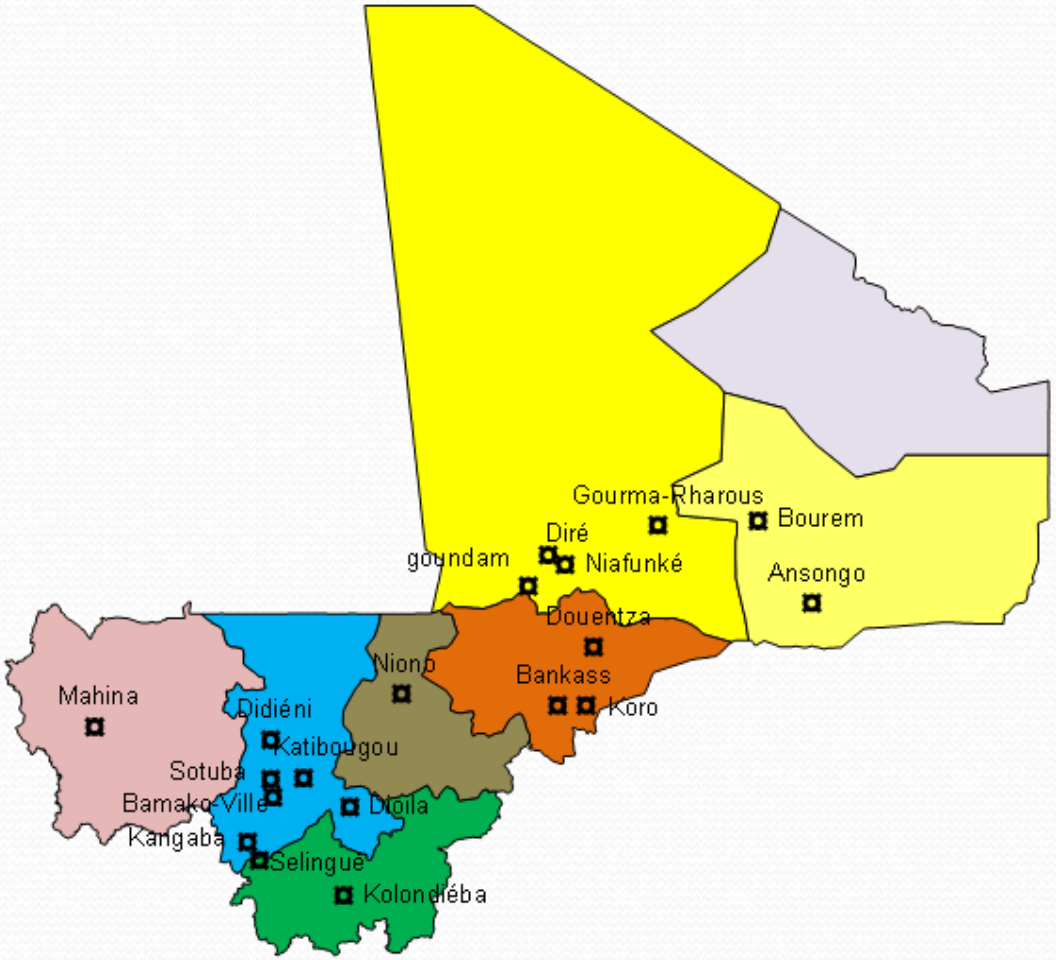


Source: Mail-Meteo

LOCATION OF AGRO-CLIMATIC STATIONS

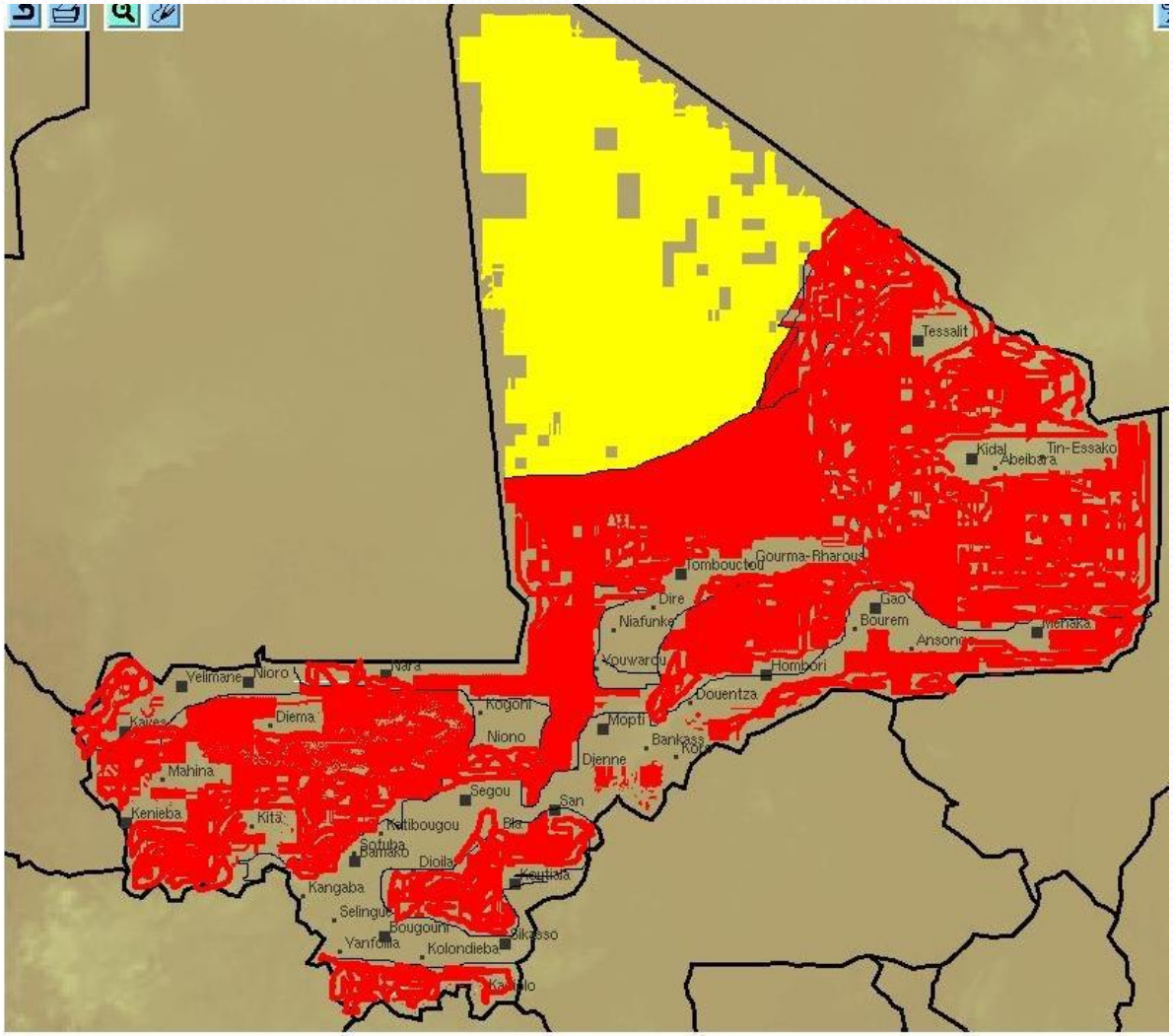
- Liste des stations:

- 1 Bourem
- 2 Kolondieba
- 3 Kangaba
- 4 koro
- 5 Bamako ville
- 6 Gourma Rharouss
- 7 Niafunké
- 8 Douentzan
- 9 Bankass
- 10 Ansongo
- 11 Dioila
- 12 Katibougou
- 13 Sotuba
- 14 Niono
- 15 Mahina
- 16 Didiéni
- 17 Diré
- 18 Sélingué
- 19 Goundam



SPATIAL OCCUPATION OF THE WEATHER STATIONS

Legend:
The red areas there 's no observation stations
TheYellow almost uninhabited area
brown weather station
Source: Mail-Meteo



EQUIPMENT STATUS IN SYNOPTIC STATIONS

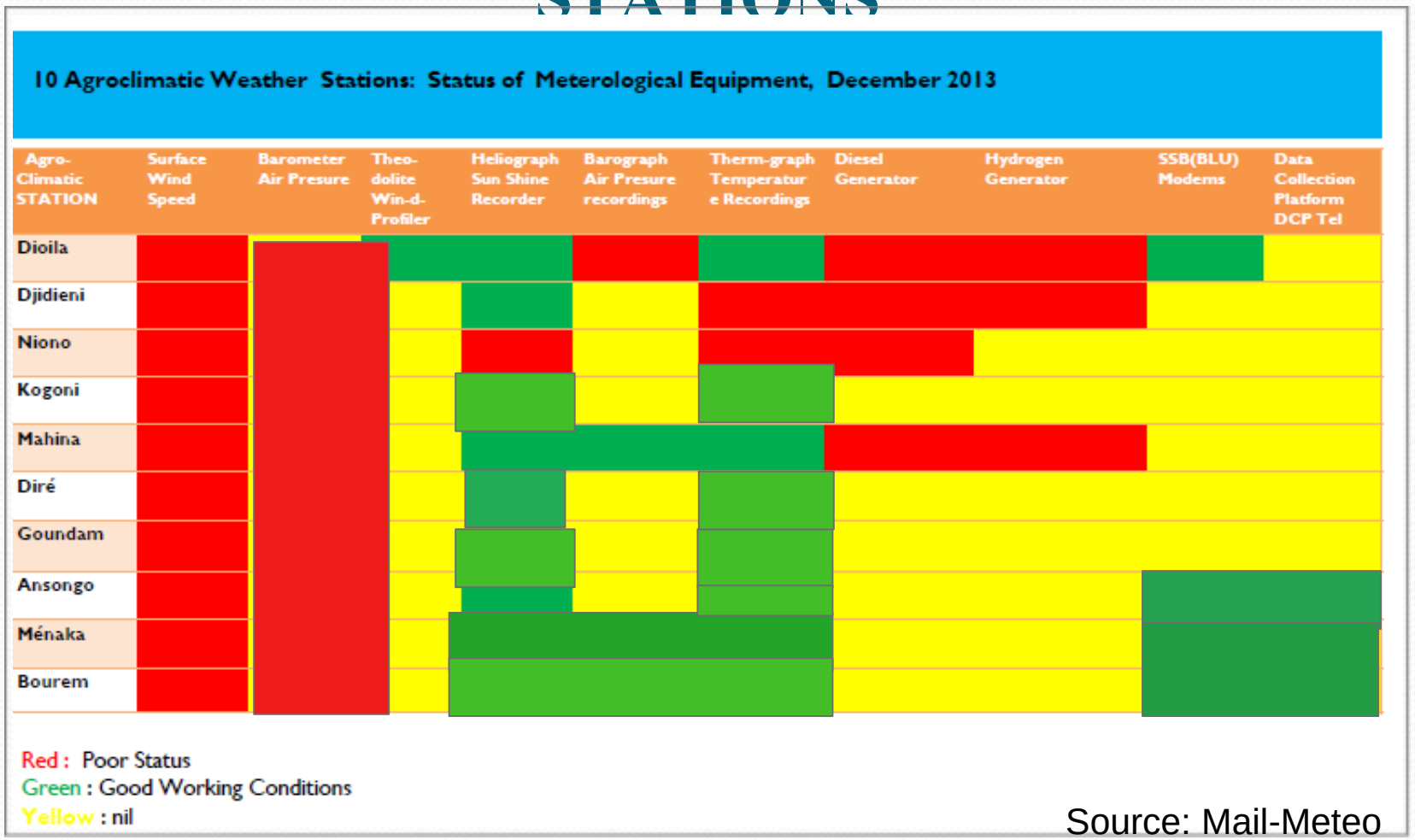
19 Synoptic Weather Stations: Status of Meterological Equipment, December 2013

Synoptic STATION	Sur-face Wind Speed	Baro-meter Air Presure	Theodolite Wind-Profiler	Heliograph Sun Shine Recorder	Barograph Air Presure Recordings	Thermo-graph Temperatur Recordings	Diesel Generator	Hydrogen Generator	SSB Radio (BLU) Modems	Data Collection Platform DCP Tel	Solar Radiation Integrator
Tessalit											
Kidal											
Timbuctu											
Gao											
Nioro			x								
Nara											
Yélimané			x					x			
Hombori			x					x			
Ménaka			x					x			
Kayes											
Mopti											
Kita			x					x			
Ségou											
San			x					x			
Kéniéba			x					x			
Bamako - Sénou											
Koutiala			x					x			
Bougouni			x					x			
Sikasso			x					x			

Red : Poor Status
Green : Good Working Conditions
x : No upper air observation at these stations

Source: Mail-Meteo

EQUIPMENT STATUS IN AGRO-CLIMATIC STATIONS

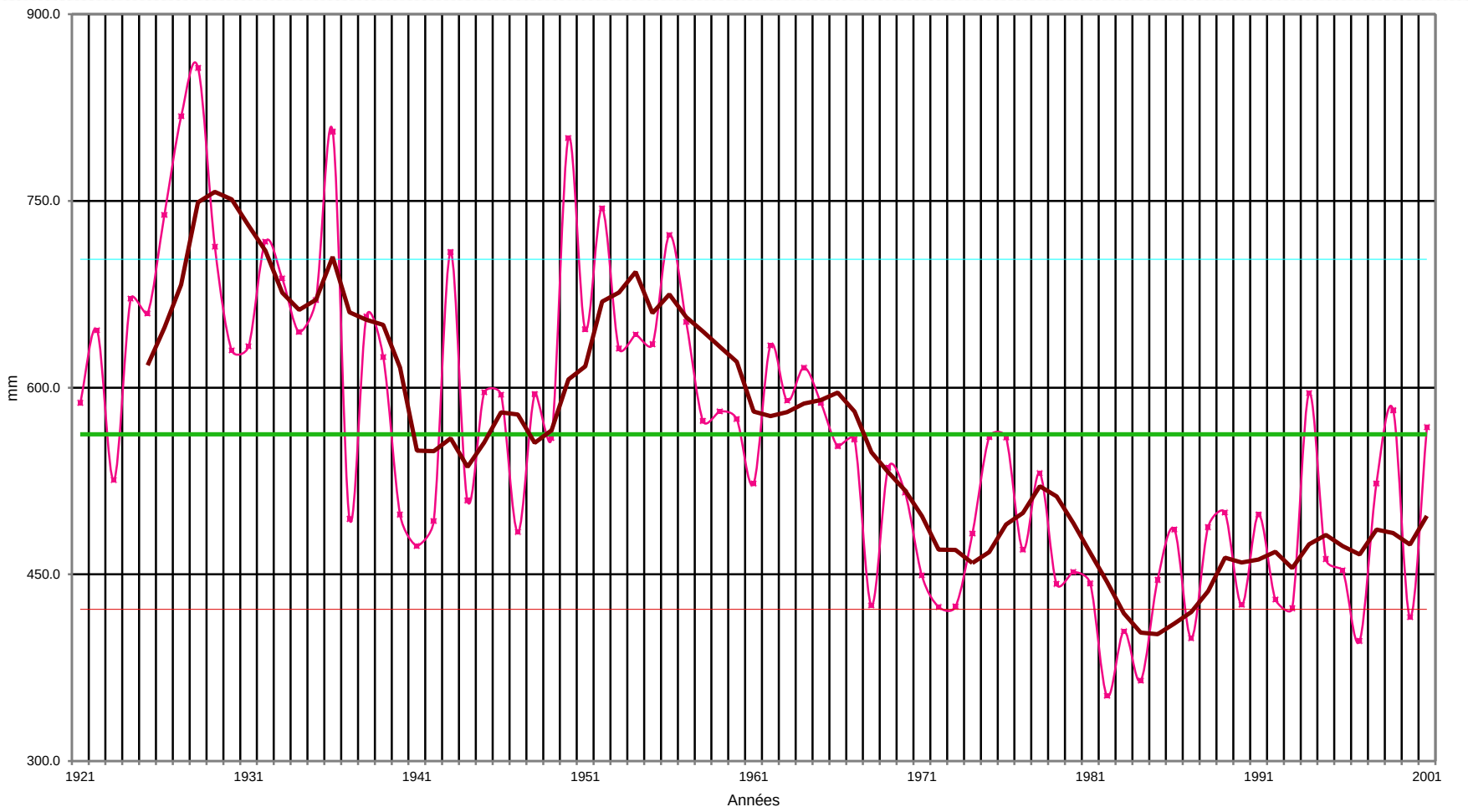


Source: Mail-Meteo

five agro climatic stations were rehabilitated in 2014

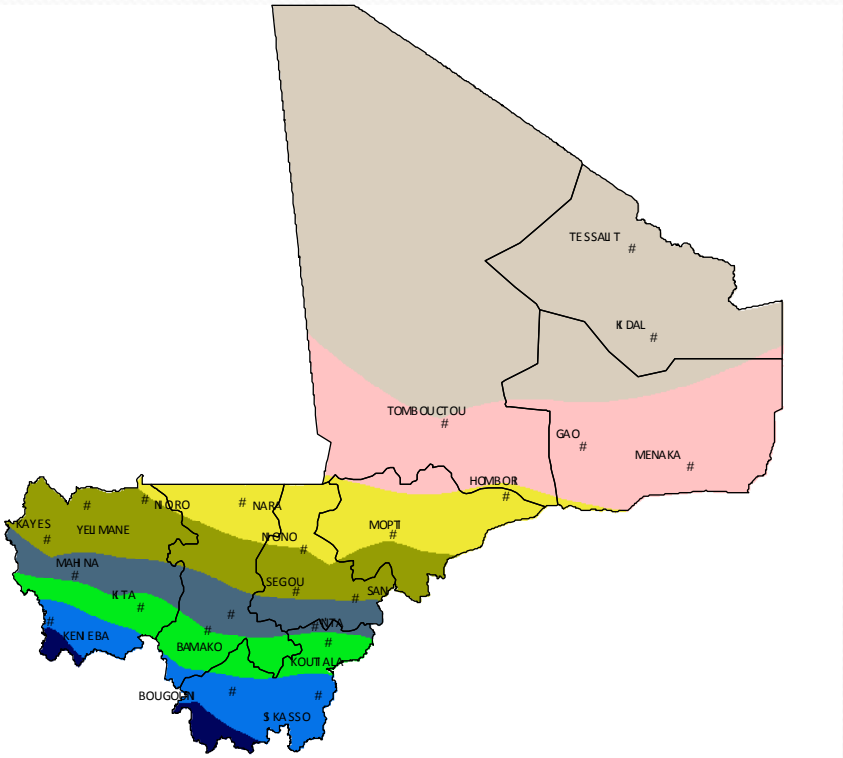
CHANGES IN RAINFALL FROM 1921 TO 2001

Source: Mail-Meteo



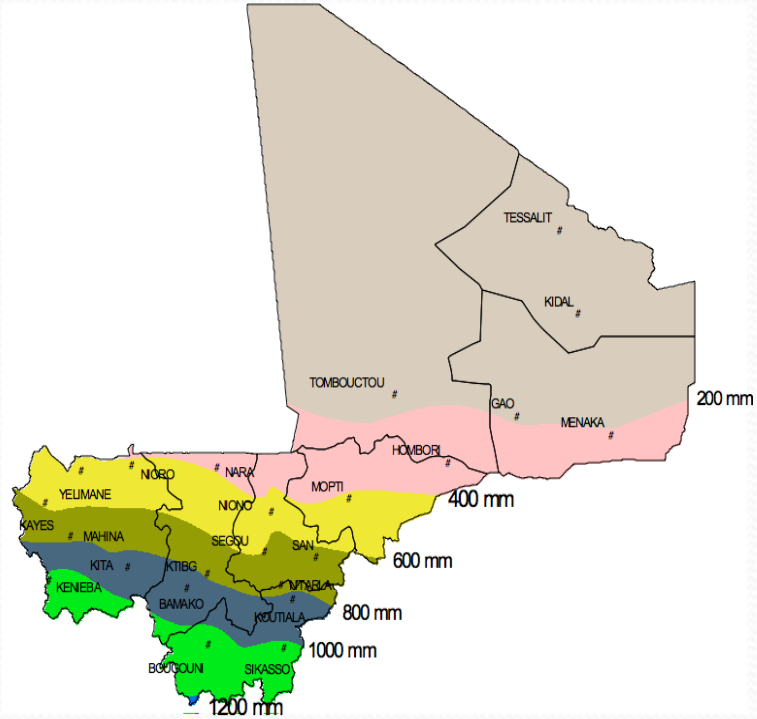
DISAPPEARING OF 1200 MM ISOHYETS

AVERAGE ANNUAL RAINFALL (mm) : 1951 - 1970



AVERAGE ANNUAL RAINFALL (mm) : 1971 - 2000

PLUVIOMETRIE ANNUELLE MOYENNE (mm) : 1971 - 2000

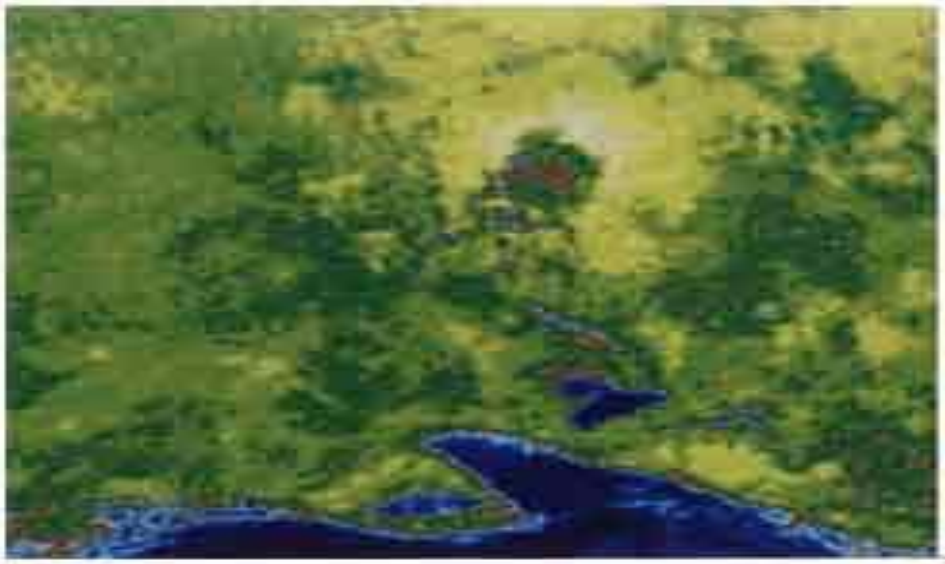


Disappearing of 1200 mm isohyets

- Reduction or decrease in rainfall
- Descent isohyets southwards;

Source: Mail-Meteo

EXAMPLE OF CLIMATE CHANGE IMPACTS IN TIMBUKTU



Tombouctou in 1976

green: vegetation on the river

Blue staining: the flood plain of the River Niger;

Brown stain in the city center;

Tombouctou in 1987

Brown stain in the city center;

Yellow: sand dunes

Blue staining: the flood plain of the River Niger;

CHALLENGES: Question

What observation system for tomorrow?

Traditional methods of data acquisition will they make room for new data sources such as satellites and radars, and the huge amount of data models?

This is one of the biggest problems in managing the Meteorological Service of Mali. The observation network is obsolete and coverage of the country is very low

CHALLENGES: Collect and exploitation of the data

Strengthening the network of collection and transmission of meteorological data on the entire territory

The strengthening of the data processing system and dissemination of data and products to facilitate the sharing of information as part of an enhanced early warning system.

The building staff capabilities MALI-METEO Agency to sustain the actions

CHALLENGES: digitization of historical data

Archival Database

The national weather archives are in a fragile, if not deplorable, condition. While the paper archives are now located in the basement of the Mali-Météo office in Bamako in clean and locked rooms, and Mali-Météo staff have sorted some stations by year from the origins to the latest paper records (see Figure 18), documents have never been scanned, and copies have not been deposited in other locations.

MALI-MÉTÉO ARCHIVES

Valuable weather archives are stored in the basement of Mali-Météo, like these from 1946. Many station data sets are already organized.

Source: Mail-Meteo 2014

Thank you for your attention