

National Meteorological Service

# **Drought conditions and strategies for their management : *Case of Côte d'Ivoire***

**Mr Kouakou Bernard DJE**

**Chief of Climatology Apply Meteorology Department  
SODEXAM / National Meteorological Service of Côte  
d'Ivoire**

**E-mail: [dkouakou\\_b@yahoo.fr](mailto:dkouakou_b@yahoo.fr)**



# OUTLINE

## INTRODUCTION

### I. DROUGHT MONITORING AND EARLY WARNING SYSTEMS

### II. DROUGHT VULNERABILITY ASSESSMENT



### III. EMERGENCY RELIEF AND RESPONSE TO DROUGHT

### IV. NEED KNOWLEDGE AND SKILLS ON MANAGEMENT OF DROUGHT


### V. NEEDS FOR PREVENTION AND MANAGEMENT



## CONCLUSION



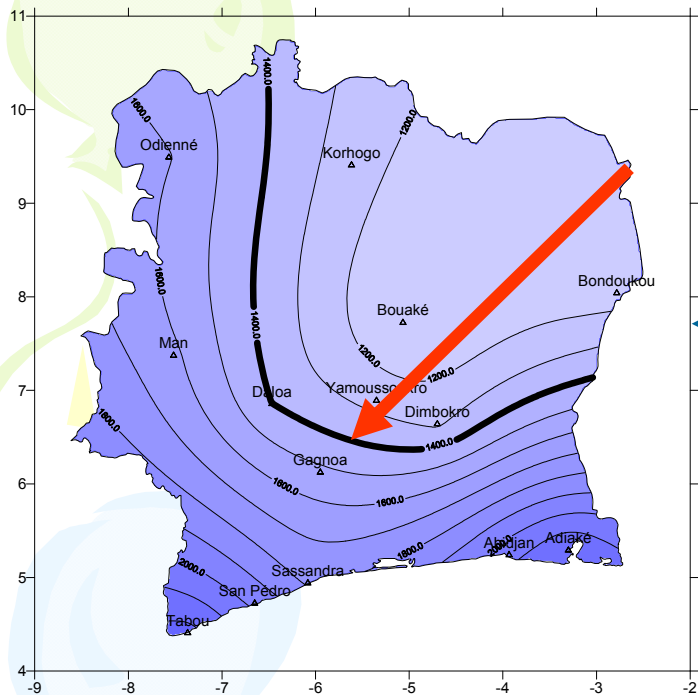
# INTRODUCTION

- Côte d'Ivoire is a country of forest and savannah.
  - The country undergoes rainfall variation observed several years ago, such as West and Central Africa.
  - This variation is reflected in a decrease of annual rainfall and a shift of onset seasons.
  - The high frequency of deficits of rainfall affects the ecosystem balance, related to specific climatic conditions and availability of water resources in the ground.
  - This situation is aggravated by the increase of population, who destroys vegetation for plantations or annual crops.
  - Drought problems are becoming therefore, a national concern.
- 

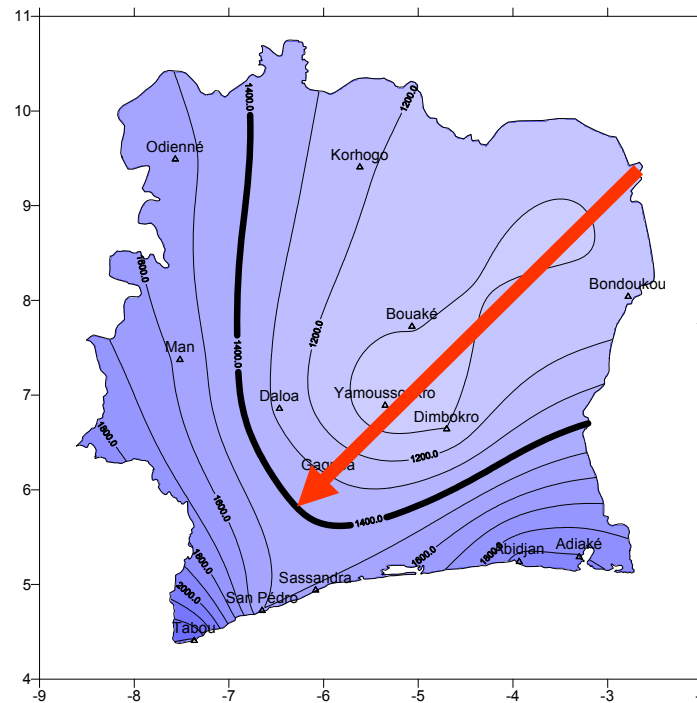


# **DROUGHT MONITORING AND EARLY WARNING SYSTEMS**

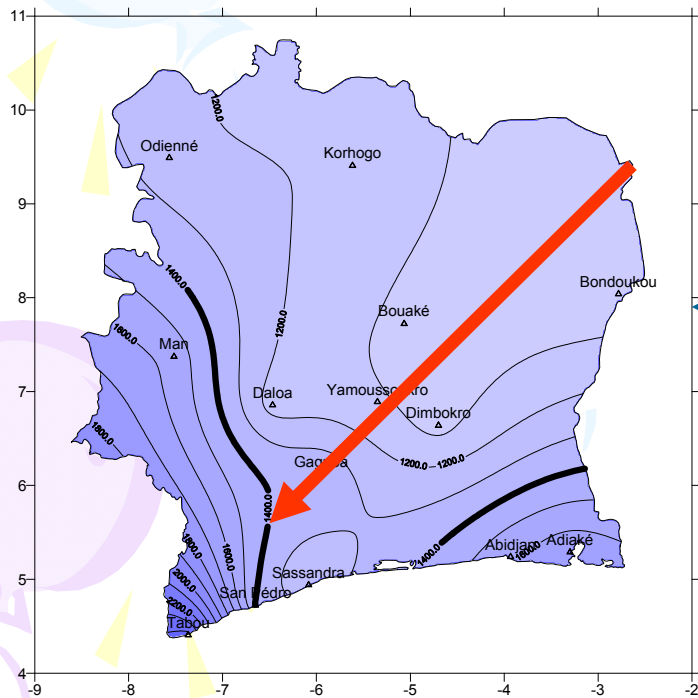
# Rainfall decadal evolution



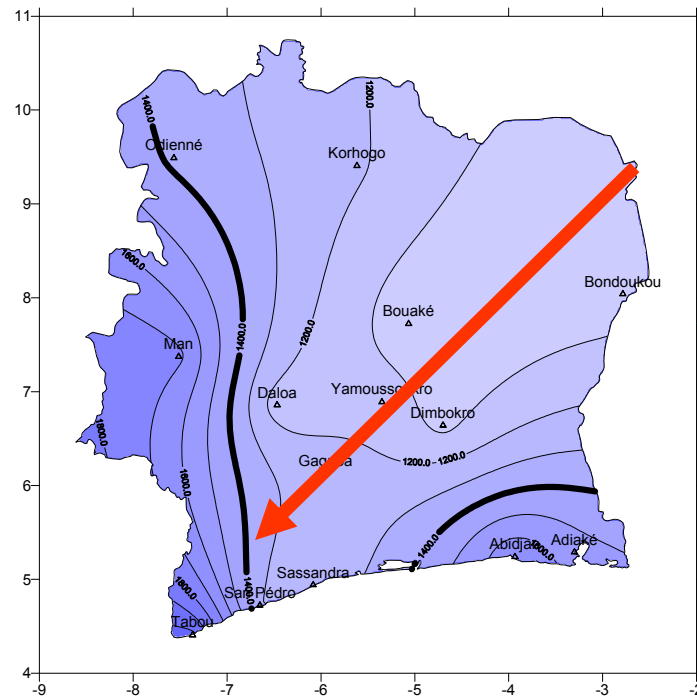
(1961-1970)  
line  
1400  
mm is  
in the  
Center



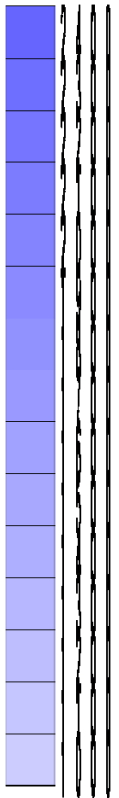
(1971-1980)  
line  
1400  
mm is in  
the  
South-  
interior



(1981-1990)  
line  
1400  
mm is  
at the  
coast



(1991-2000)  
line  
1400  
mm is  
at the  
coast  
and  
near  
Tabou



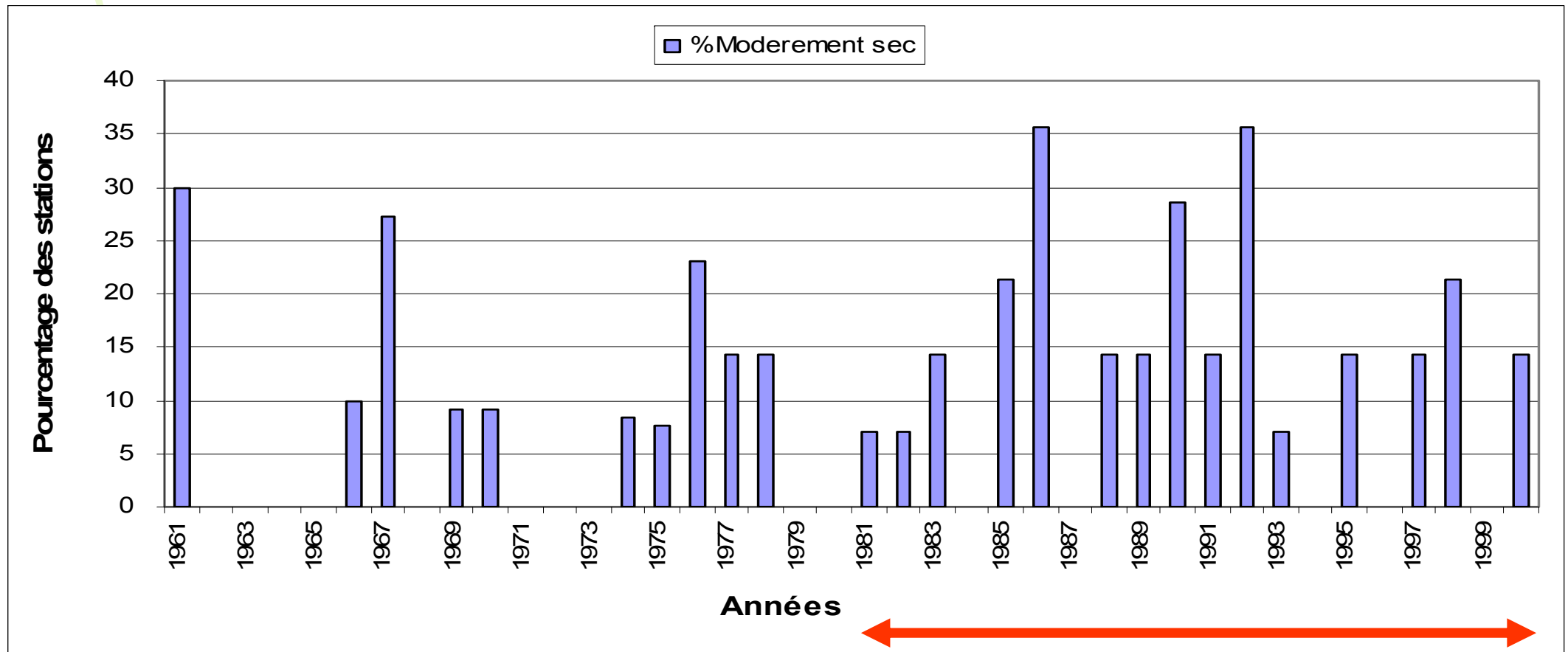
## Drought monitoring

The characterization of the drought in Côte d'Ivoire is using the Standardized Precipitation Index (SPI) .

- SPI values are calculated for one, 3, 6 and 12 months,
- Referring to SPI classification system as proposed by McKee et al , (1993) , we consider that we are facing a phenomenon of drought when the index values fall below -0.99 .
- Duration of the drought sequence corresponds to the time during which the values of SPI remain below -0.99 .



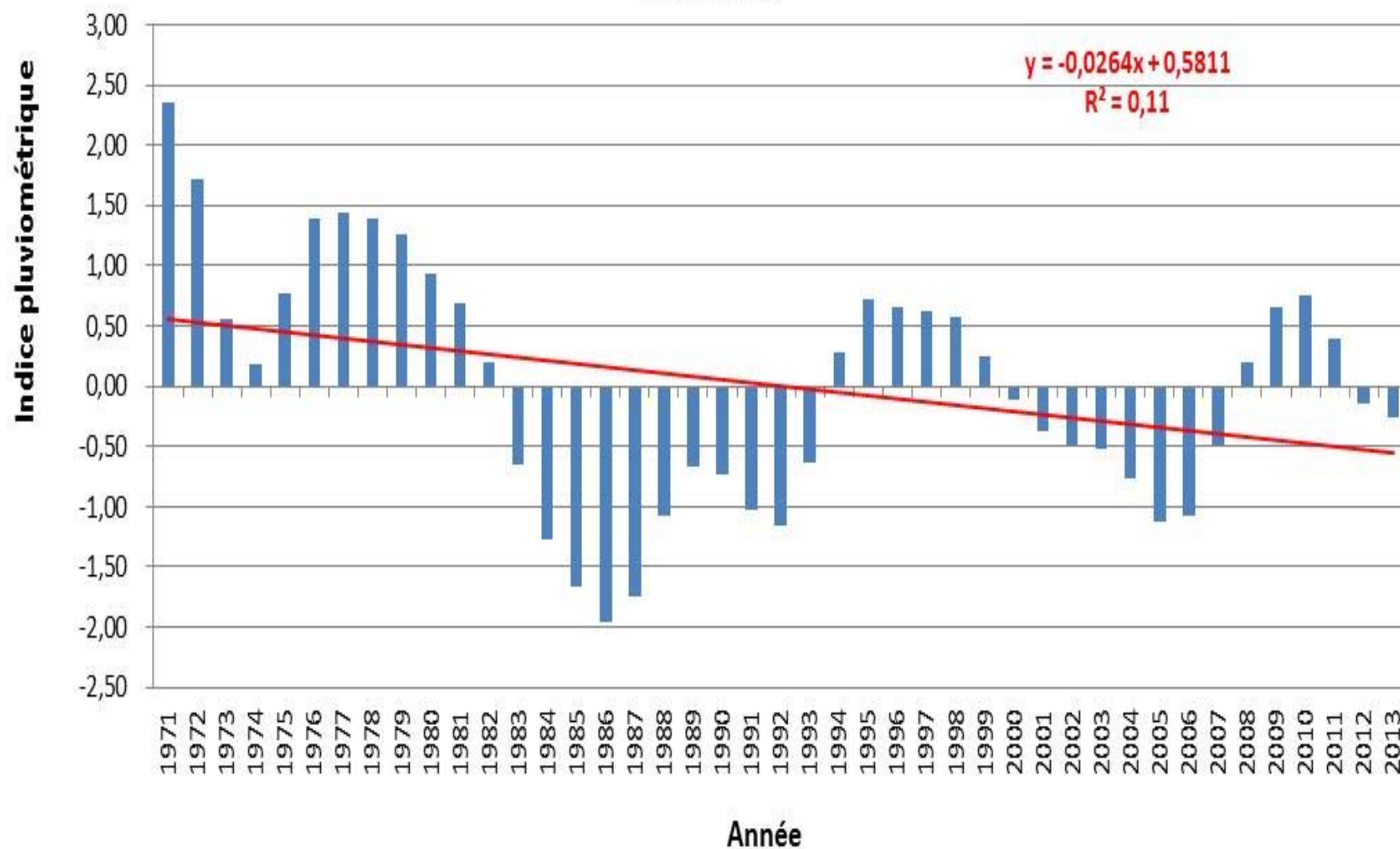
# Distribution of drought



- 1961-1978: 15% of regions were affected;
- 1981-2000: 17% of regions were affected (strong recurrent of drought since 1981)

Station

## Odienné





## EARLY WARNING SYSTEMS

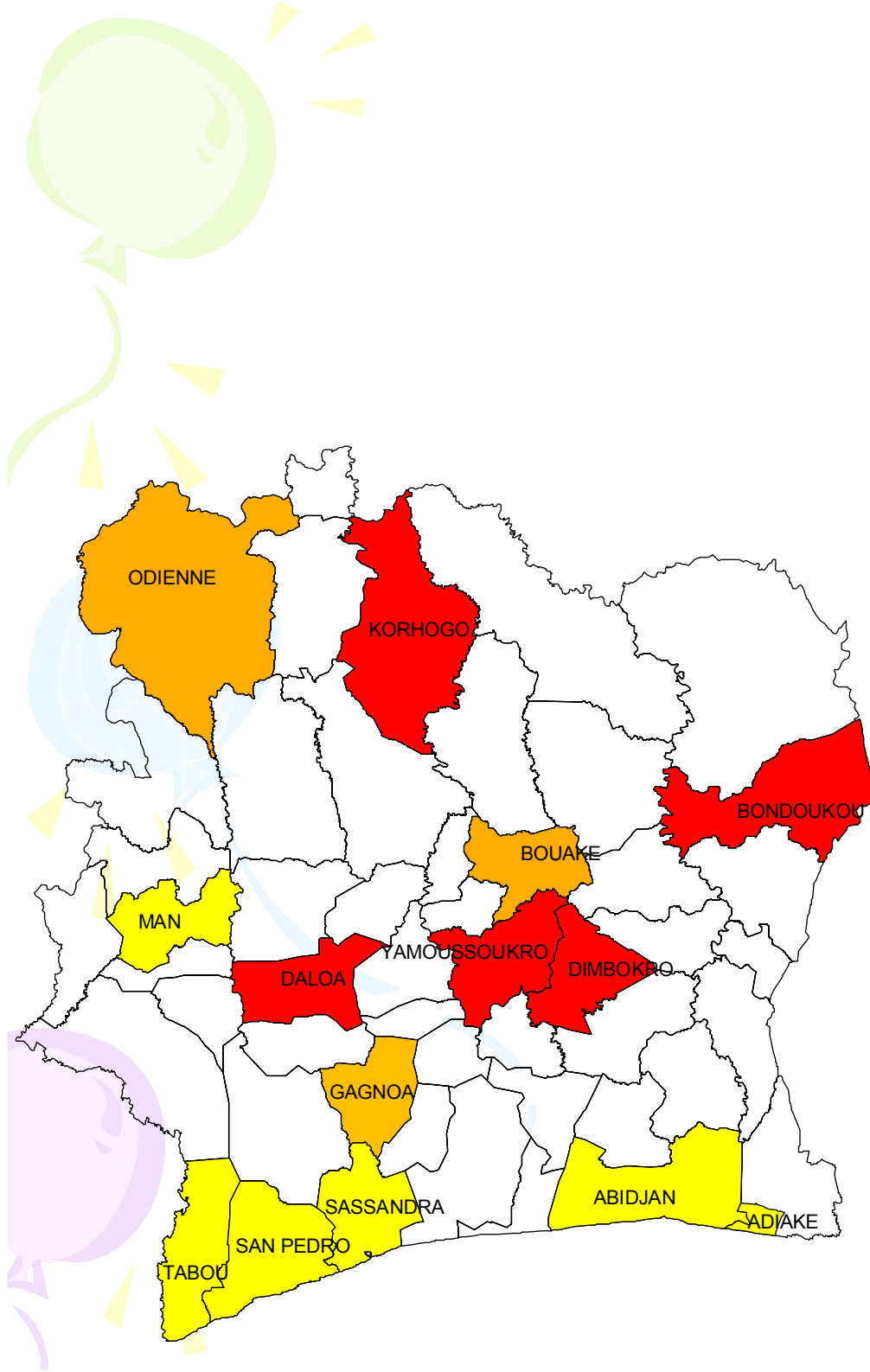
As part of the improvement of warning systems, National Meteorology Service ( SODEXAM / DMN) develops and distributes a 10 days bulletin "**Special Risk of bushfires** ."

This bulletin is designed based on the 10 days monitoring index of Angstrom based on temperature and relative humidity,

**Objective:** to provide a useful set of information to fight against bush fires that cause annual forest destruction, plantations , villages and loss of life,

**Destination:** policy makers and all national institutions in charge of disasters

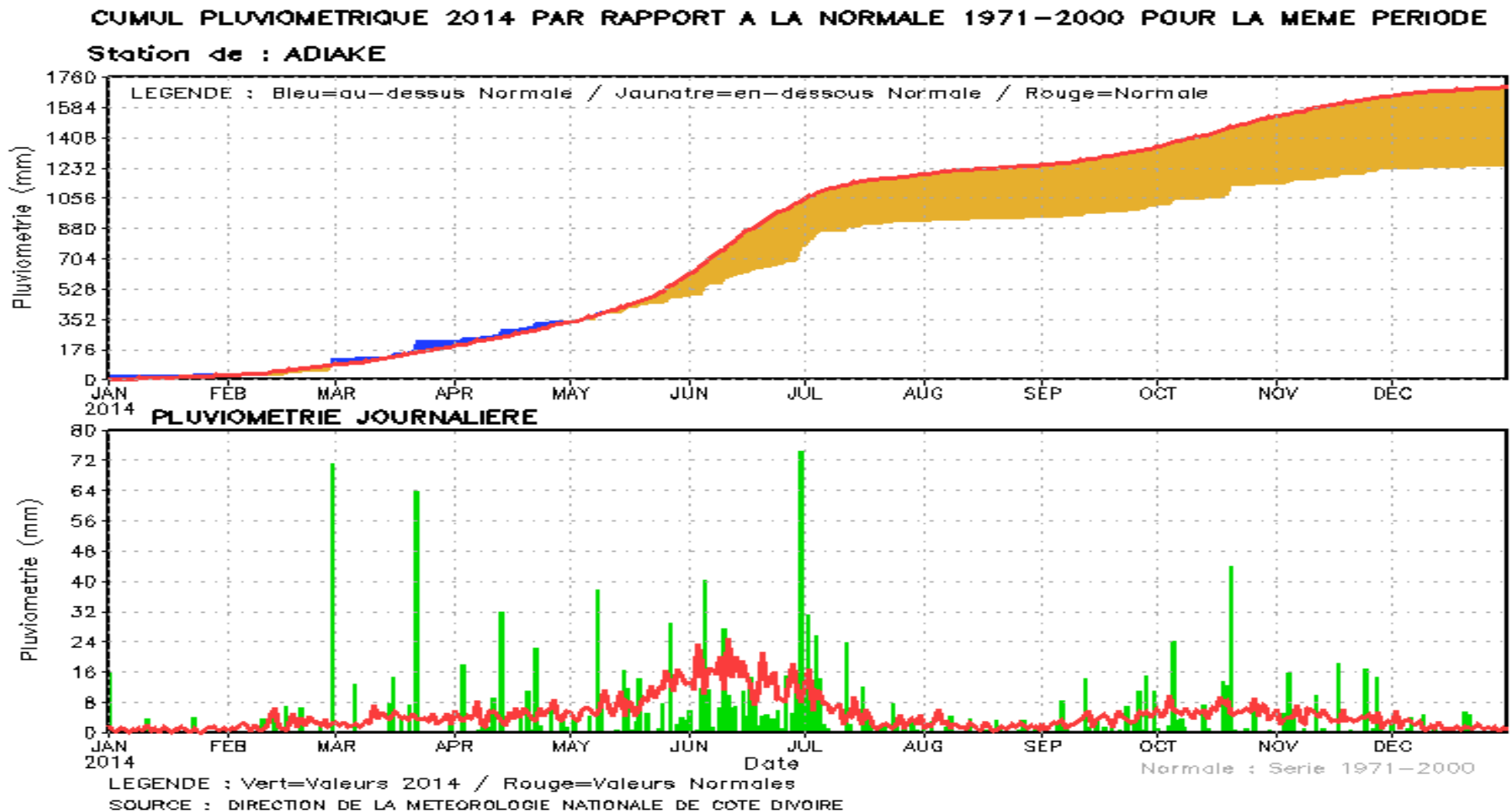
# Map of dekad 01, january 2009



LEGEND	OBSERVATIONS
Moderate risk	No vigilance
High risk	Vigilance in the use of fire for agricultural works and other
Extreme risk	High vigilance in the use of fire
Not evaluated	No data

# Analysis of rainfall profiles

**Objective :** to track on a daily scale, rainfall variations from normal.  
When the rainfall deficit becomes persistent in the month , drought notices are issued for national agencies ( ONPC, ANADER ).



# Spatial monitoring

## IL ETAT DU COUVERT VEGETAL

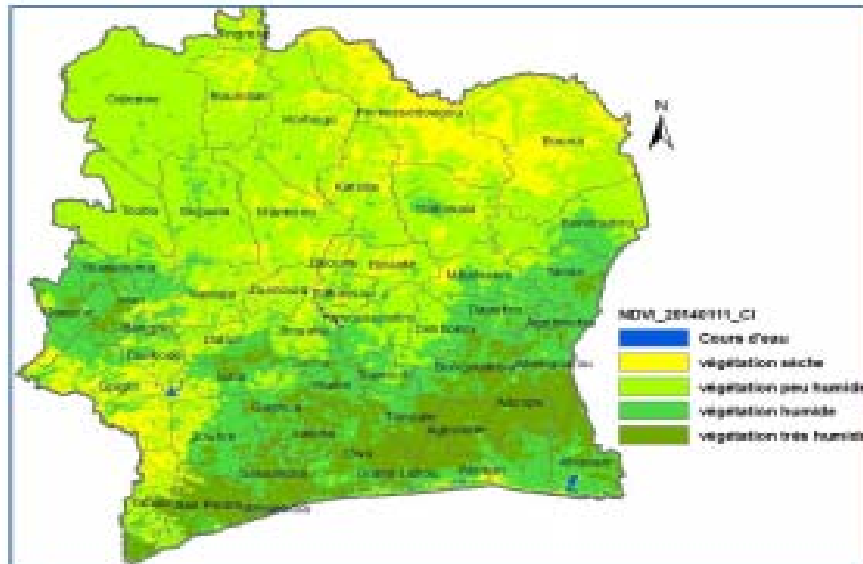


Figure 1 : Etat moyen du couvert végétal du 11 au 20 janvier 2014

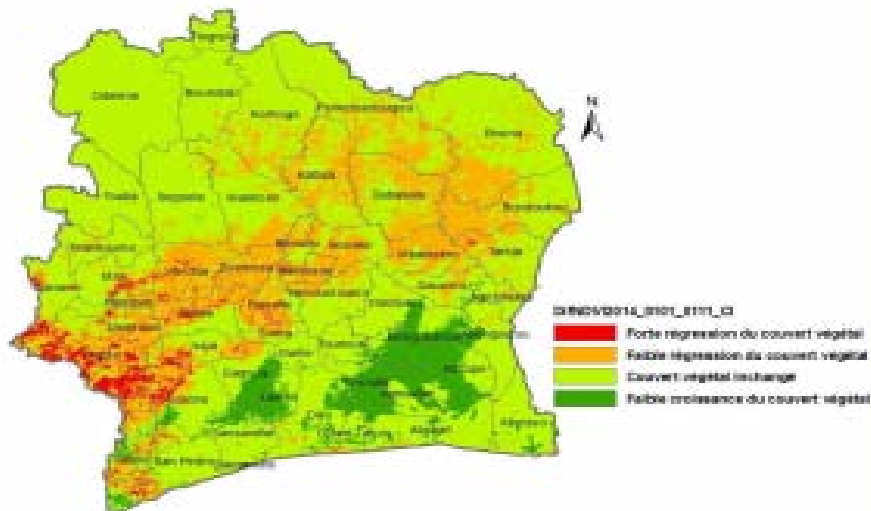


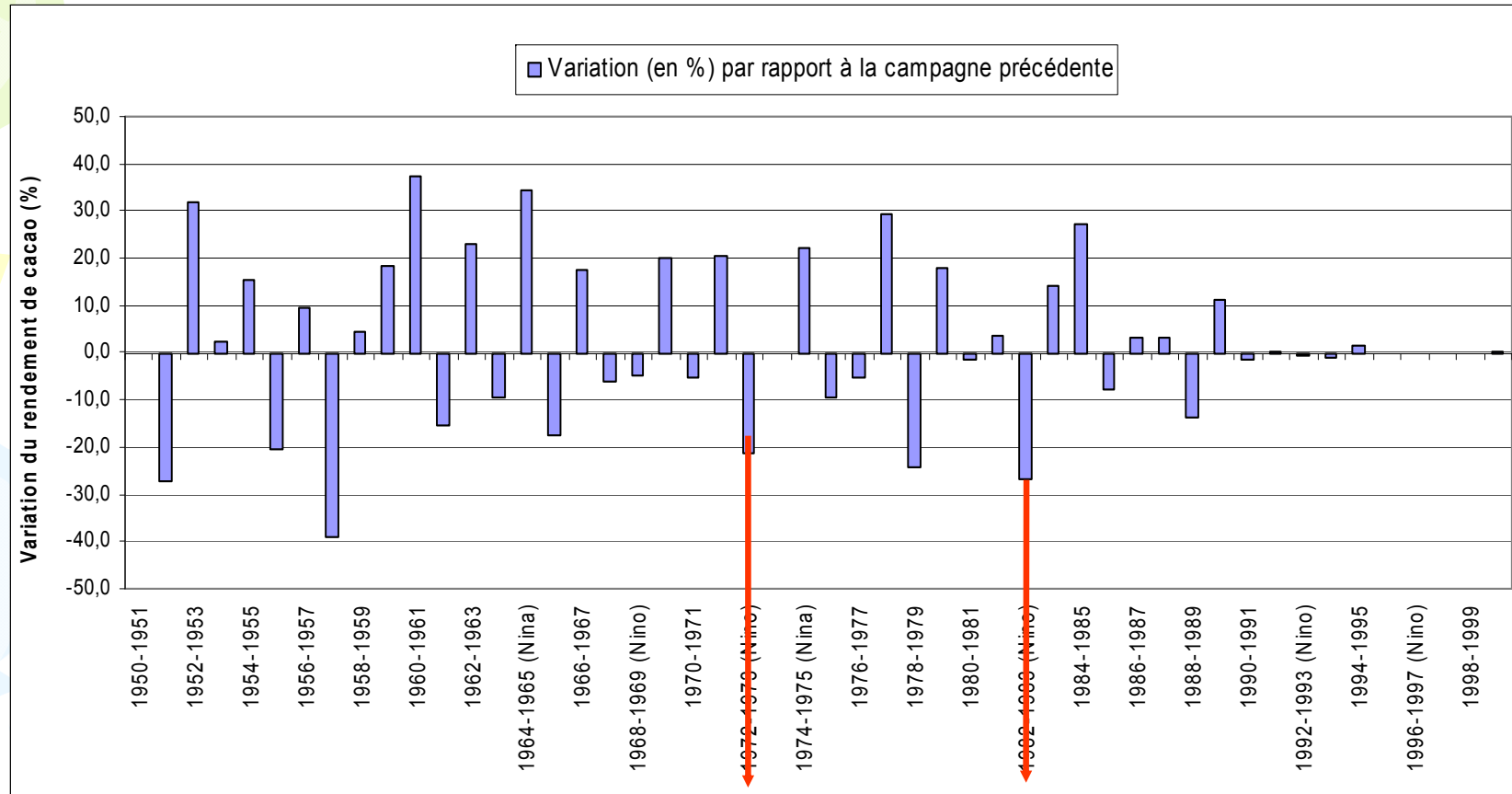
Figure 2 : comparaison de l'Etat moyen du couvert végétal du 11 au 20 janvier 2014 et du 01 au 10 janvier 2014

**NDVI** index is followed at dekad (10 days) scale to track the dryness of the vegetation at national level



# **DROUGHT VULNERABILITY ASSESSMENT**

# Cocoa yield variation compared to the previous yield



Drop of cocoa yield about 21% and 27% during the 1972-1973 and 1982-1983.

With 1.5million T/year, Côte d'Ivoire is the first producer in the world. The lost is estimated at around \$US 500,000,000.

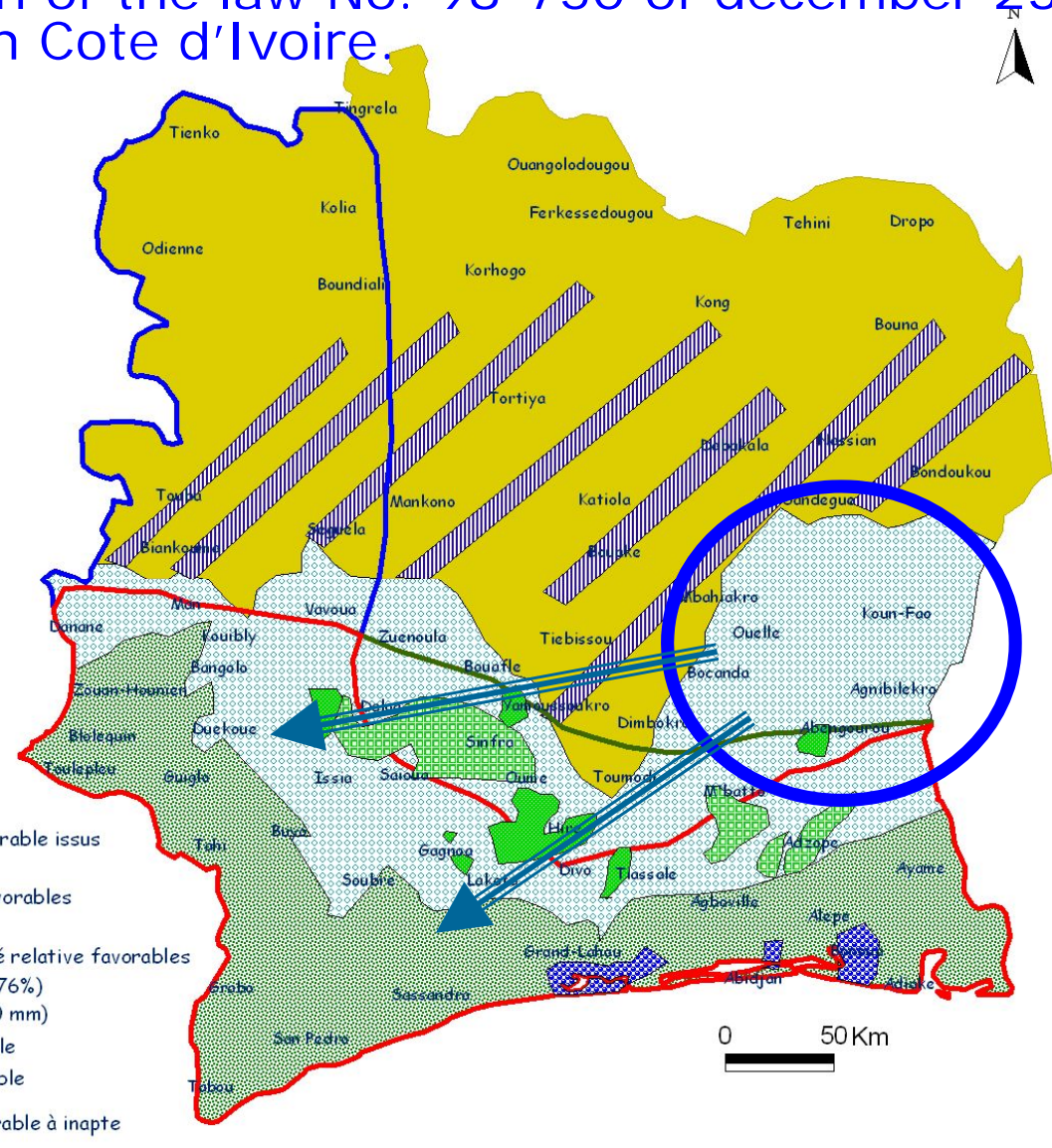


# Social impact

- Movement of farmers towards forest regions to practise their agricultural activities.
- High concentration of population in these regions, source of many conflicts between natives and farmers.
- Rural rights problem : adoption of the law No. 98-750 of december 23<sup>rd</sup> 1998 on national rural rights in Cote d'Ivoire.

Movement of farmers from the old loop of cocoa to forest areas since 1970s.

Old loop of cocoa in 1960s





# **EMERGENCY RELIEF AND RESPONSE TO DROUGHT**



# LEGAL REGULATIONS

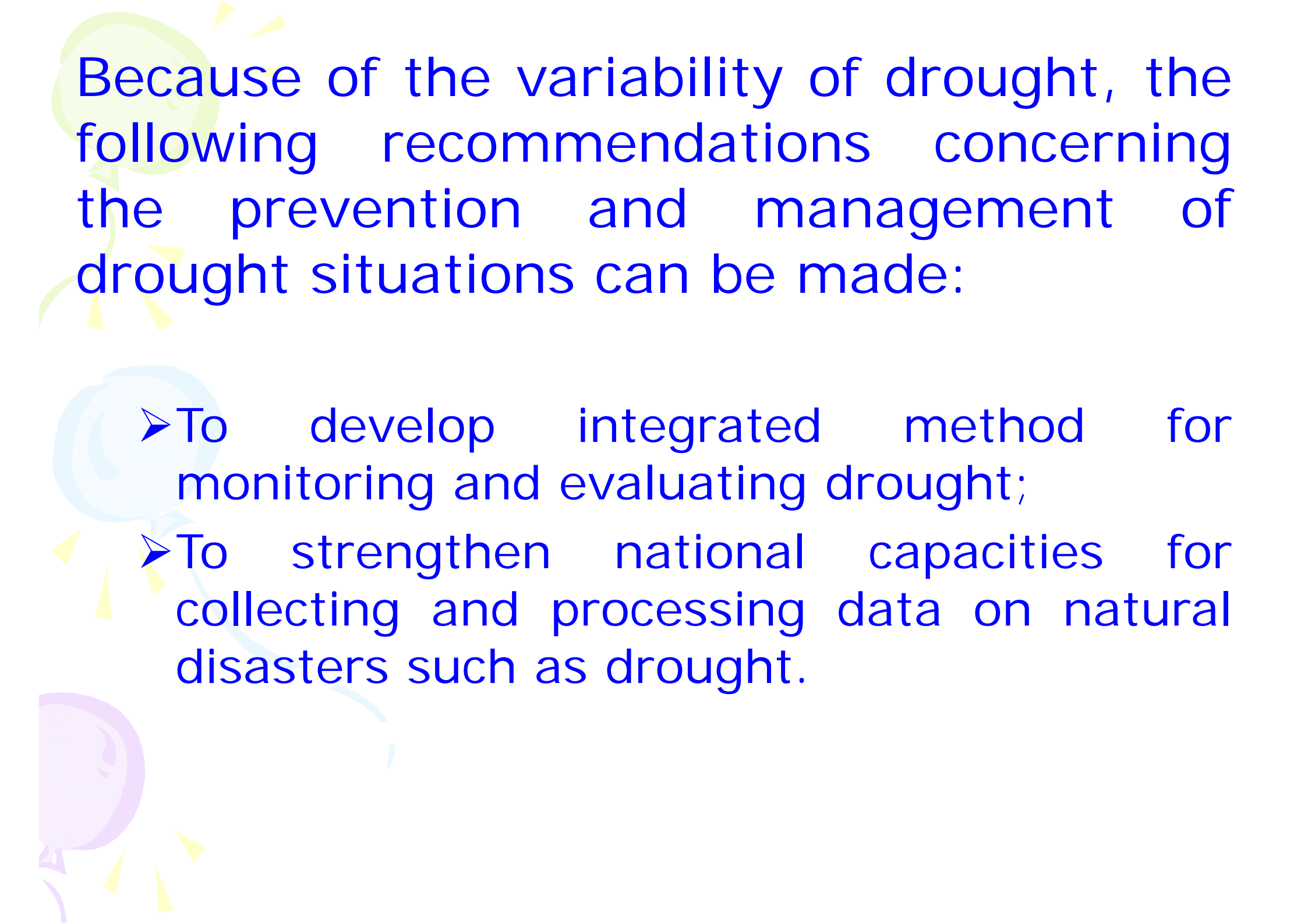
There is no institutional and legal dispositions concerning especially drought.

The problem of drought is taken into account in general political management of environment and forest, energy, water and, regulations texts that follow.

However, since ratification of the United Nations Convention to Combat Desertification (UNCCD) by Côte d'Ivoire, the implementation of institutional and legal texts in what concerns drought and dersertification is in progress.



**NEED KNOWLEDGE AND SKILLS ON MANAGEMENT OF DROUGHT**



Because of the variability of drought, the following recommendations concerning the prevention and management of drought situations can be made:

- To develop integrated method for monitoring and evaluating drought;
- To strengthen national capacities for collecting and processing data on natural disasters such as drought.



# CONCLUSION

- The effects of drought have weakened the Ivorian economy, especially droughts of 1983, 1998 and 2010.
- Joint efforts at national and regional level should be undertaken to monitor the drought and mitigate its negative effects.

**THANK YOU  
FOR YOUR  
ATTENTION**

