



# **NENA Soil Partnership Conference: towards a regional implementation plan on sustainable management of soil resources**

**1-3 June 2015, Amman, Jordan**

## **Status of Soil Resources and Priorities towards Sustainable Soil Management**

**Challenges, Opportunities, National Policies and Institutional Mechanisms**

**Country: Algeria**

**By: Abdelhakim OUZZANE – INRAA**

## ALGERIA ( Brief Overview )

- 48 Wilaya or Departments
- Area: 2 381 741 Km<sup>2</sup>
- Population: 39 500 000
- Borders with 7 countries  
& the mediterranean sea  
in the north
- Mediterranean climate

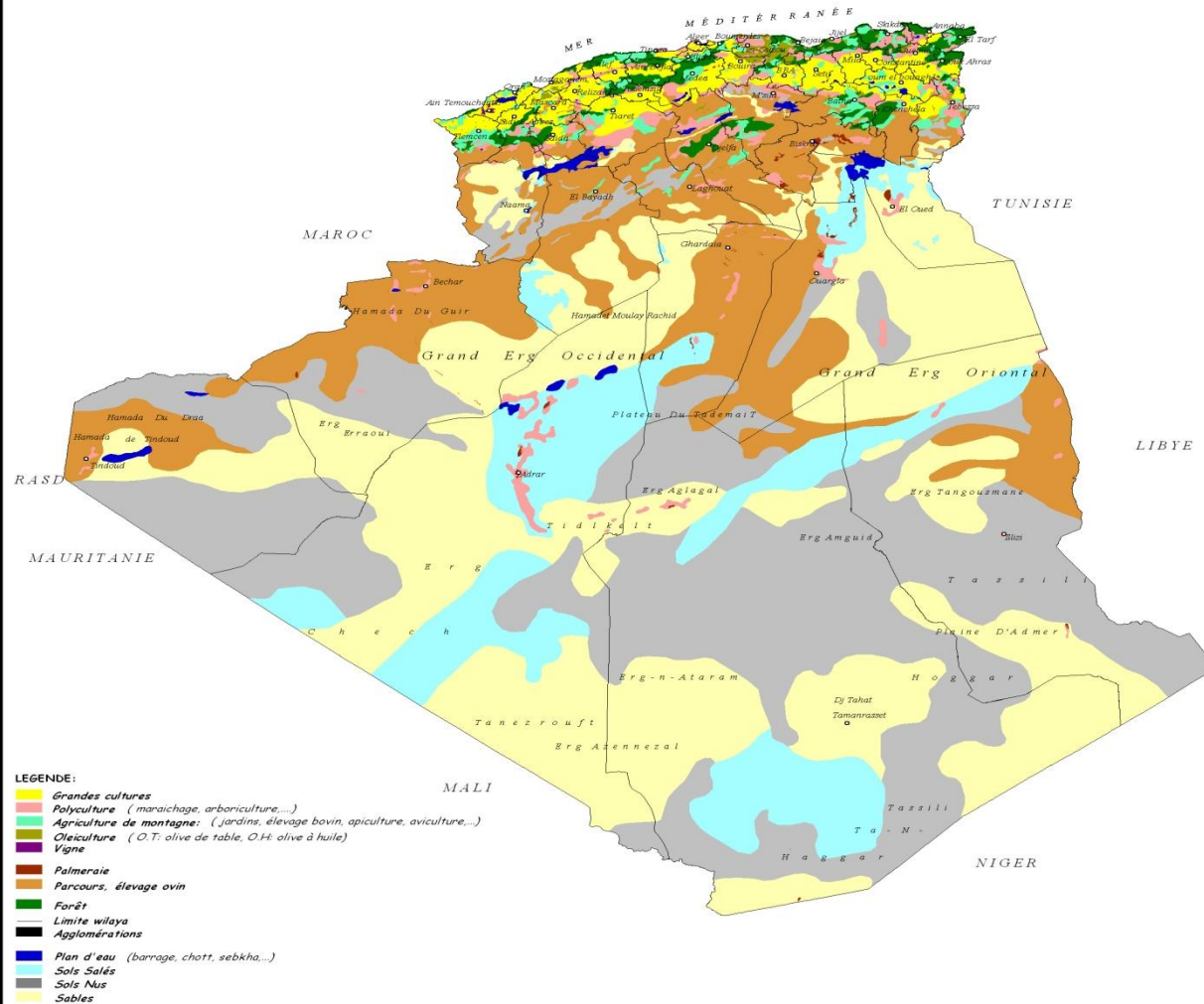


# Introduction

- Agricultural sector as part of the national economy
  - Main indicators of Algerian agriculture:
    - Area:
      - Total Agricultural Area (SAT): 42,888,555 ha
      - Used Agricultural Area (SAU): 8,465,040 ha (Including irrigated area: 1,147,255 ha)
      - Forest area: 4,232,685 ha
    - Production value: It evolves from 1.507 billion DA in 2009 to 2.761 billion DA in 2014, an increase 83%.
    - Growth rate: The average annual growth rate during the period from 2009 to 2014 is about 11%

- Annual growth for the different sectors in 2014 is as follows:
  - Grains: 4.2%
  - Vegetable: 13.4%
  - Potato: 12.6%
  - Red meat: 12.5%
  - White meat: 12.6%
  - Milk: 8.3%
  - Eggs: 7.5%
- The number of jobs at the farm level has increased from 2,358,327 to 2,550,712 people, an annual average increase of 8.2%.

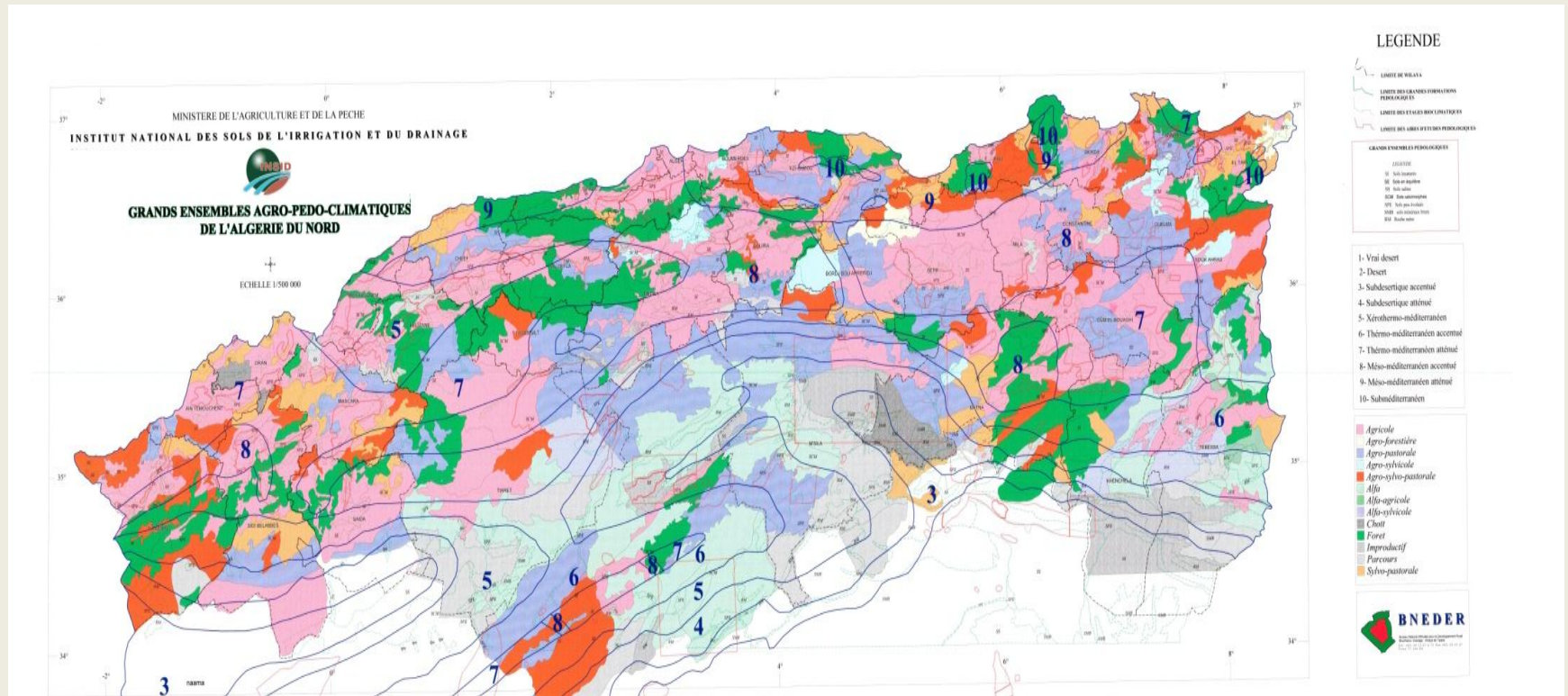
REPUBLIQUE ALGERIENNE DEMOCRATIQUE ET POPULAIRE  
 MINISTRE DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL  
 INSTITUT NATIONAL DES SOLS, DE L'IRRIGATION ET DU DRAINAGE  
**CARTE AGRICOLE DE L'ALGERIE**



N  
 Echelle réduite:  
 150 Km



# Agro Pedo Climate Map, North Algeria (INSID)



- Soil/land resources and the agricultural sector

How about Soil Resource in Algeria?

- Agricultural development is conditioned by the mobilization of the soil resource and its preservation. Knowledge of the potential of the soil in Algeria is not fully known, So:
  - The inventory of soil surveys shows a great deficiency;
  - The total area mapped soil is of the order of 3% for a Total Agriculture Area and 20% of the total Used Agriculture Area ;
  - The soil classes map of North Algeria established by JH Durand in 1954 is the only existing document (1/500 000<sup>th</sup>), The soils were classified according the French system CPCS

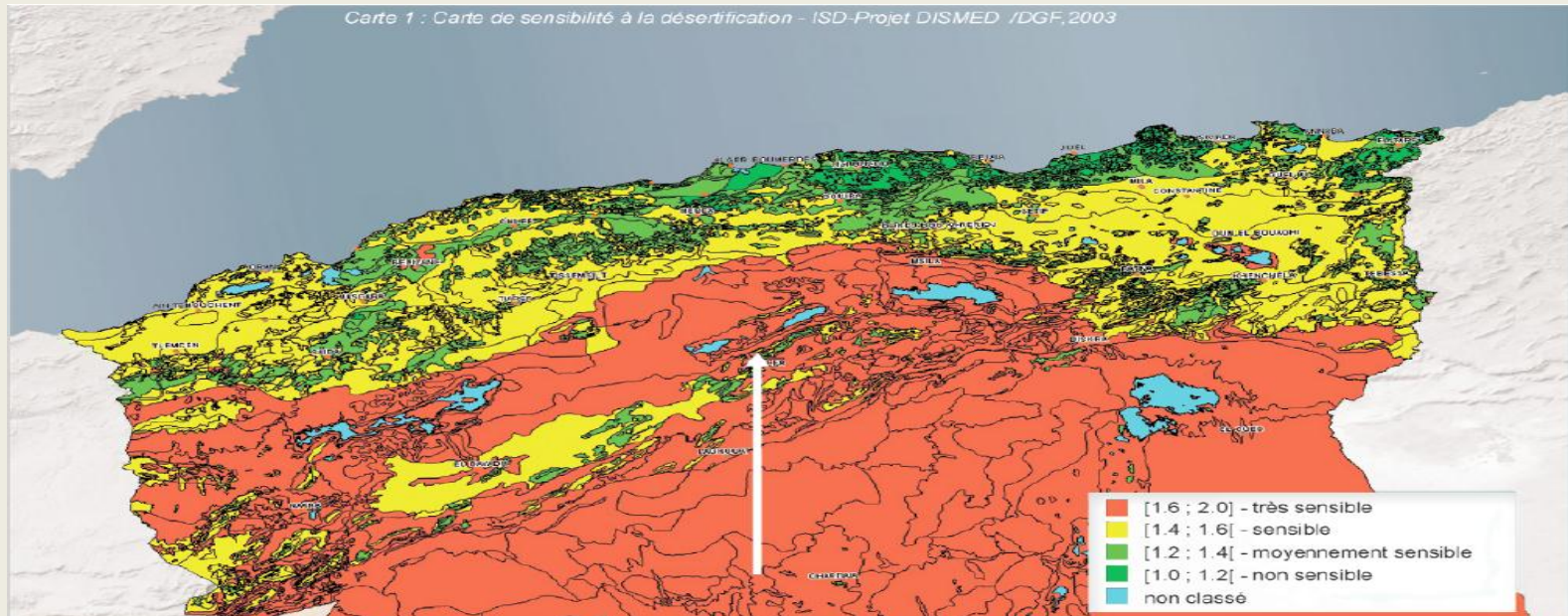
# Characterization of soil resources

- From north to south, Algeria has 3 main geographical regions: the Tell in the north, the Highlands and the Saharan Atlas in the center, and the Sahara in the South.
- 1- The Tell is a narrow coastal strip of 1200 km long and 100 to 200 km wide. This set consists of fertile plains (like the Mitidja south of Algiers) where the majority of the population is concentrated, valleys and a succession of mountains.
  - 2- The highlands and the Saharan Atlas range from the West border to the northeast of the country. All highlands offers a unique steppe landscape
  - 3- In the south, the Sahara covers 2 million km<sup>2</sup> (2,000 km from east to west, 1,500 km from north to south). The Great Southern Algeria alternates between volcanic landscapes and sandy plains (Ergs).  
High temperature in a desert climate, intense evaporation, very limited rainfall and persistent winds often sand characterize the Saharan environment. All these adverse conditions make it virtually impossible any culture without irrigation.



# Major challenges of soil resources - Biophysical

- Type of challenges and area affected
  - **Soil Erosion**: It caused over time important agricultural land degradation and rendered useless vast areas of the most fertile soils in Algeria. In fact 45% of the Tellian area (~ 12 m ha) are affected by erosion. Erosion amounts and frequencies in Algeria are among the highest in the world (Demmak in 82 estimated soil erosion between 2000 & 4000 Tons/Km<sup>2</sup>/year).
  - **Desertification**: It 's either caused by drastic changes in climatic conditions for a long period of time, or due to the action of man and his cattle (intensive grazing). **Exp:** The **Steppe** is affected the most by man induced desertification. Vegetation cover is reduced to a critical limit in these dry areas.



- **Salinity**: Soil salinity is a common problem for the Western & Southern regions of Algeria. Using groundwater for irrigation had its consequences on the degradation of soil quality in these regions. Irrigated agricultural areas have shown an increase of Salinity at various rates.
- **Loss of Soil Fertility**: Intensive agriculture and monoculture regime provoke long term losses of soil fertility. Important surfaces in Algeria are affected to cereal production, cultivated under a monoculture regime & 2 year Rotation (Cereal / Fallow).
- **Pollution**: Mining region, Pollution from industrial waste, Pollution of soil near dumps, Pollution of agricultural soil by heavy metals
- **Urbanization**: Strong pressure on arable land because of an uncontrolled urbanization mainly in the north

**The government's priority is to reach a food security**

# Major challenges of soil resources

## Policy and Institutions

- Analysis of major issues and suggested solutions
  - Extension of irrigated area from 400 to 650 m ha in 2013
  - Solutions to Soil erosion (Mechanical solutions – Rock Barrier)
  - Revival & Stimulus of Green Dam from East to West
  - Biologic helpful Reforestation solutions (fruit trees and Rustic)
- Capacity development program implemented by the MADR (Research & Technical Institutes are all involved in this program)

# Opportunities towards sustainable soil management

- Based on available resources
  - Ranking farmland
  - Determination of soil agricultural potentials
  - Determination of the status of soil fertility
- Based on current and future actions
  - Promotion of good agricultural practices through rational utilization of mechanization
  - Promoting conservation agriculture (No Tillage)
  - Strengthening the regulation related to the protection of soil
  - Implementation of monitoring and evaluation programs

# Concluding remarks

- Summary of main challenges
  - Ensuring food security
  - Ensure soil conservation
    - Leveling and adapting Law & Regulations
    - Good agricultural practices
    - Mapping of areas characterized by erosions phenomena
    - Knowledge of erosion phenomena and their management
    - Managing the effects of climate change
    - Support for soil pollution problems
- Suggestions to achieve sustainable soil management (country level but within regional context)
  - Strengthen national and regional collaboration at different levels
  - Exchange of experience (capacity building) between countries with the same problems (Training, Awareness, ...;)
  - Harmonization and standardization of reference laboratories