

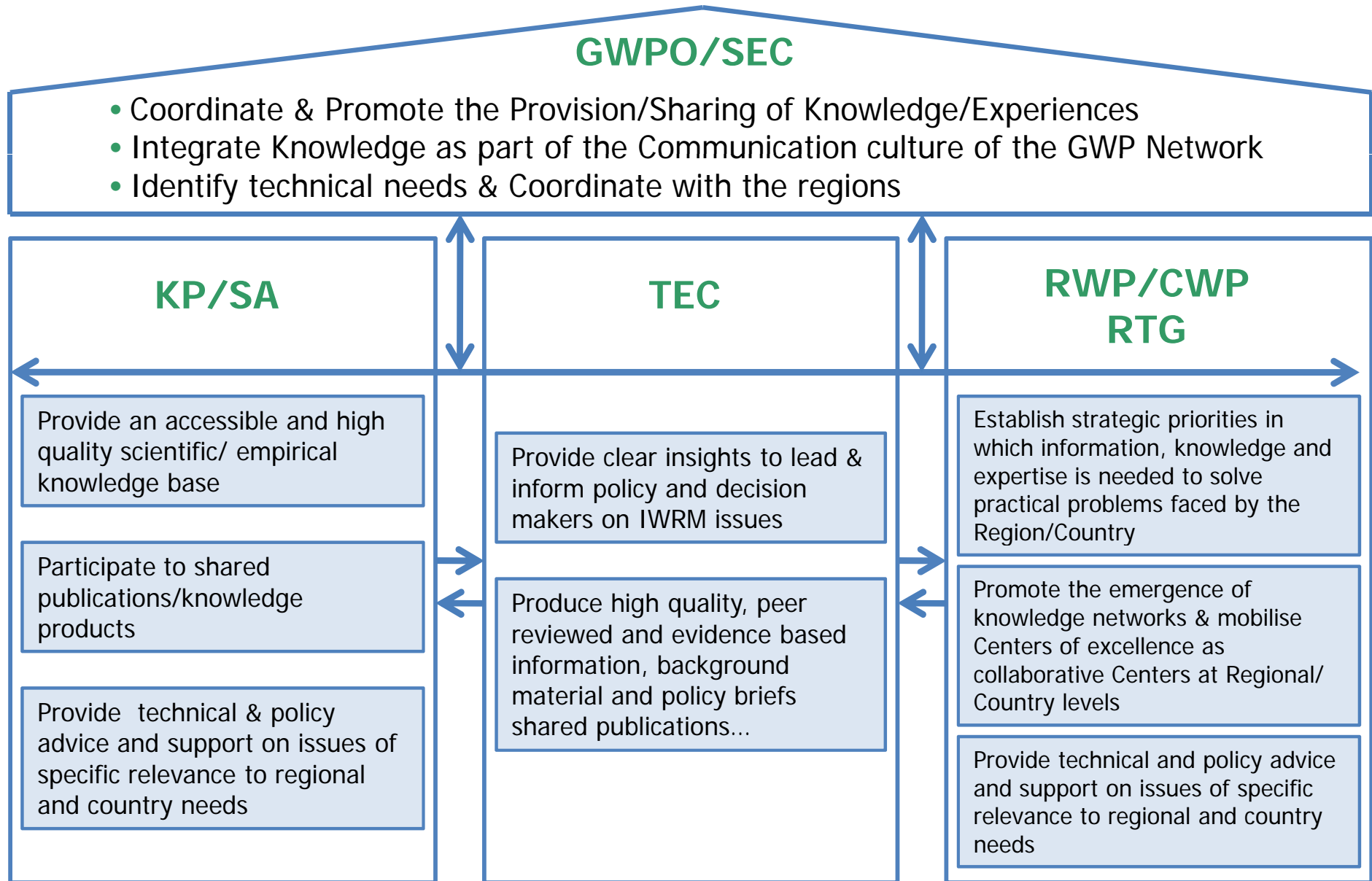
# **Consultation Meeting On the Integrated Drought Management Programme**

Mohamed AIT KADI  
Chair of GWP Technical Committee

Geneva, Switzerland, 15-16 November 2010

- ◆ To provide **intellectual leadership** on key strategic issues (GWP strategy 2009-2013)
- ◆ To be fully involved in **Making GWP's Knowledge Chain Work** : technical capacities, experiences and expertise of **regions** will be **systematically mobilized**

# GWP Knowledge Chain

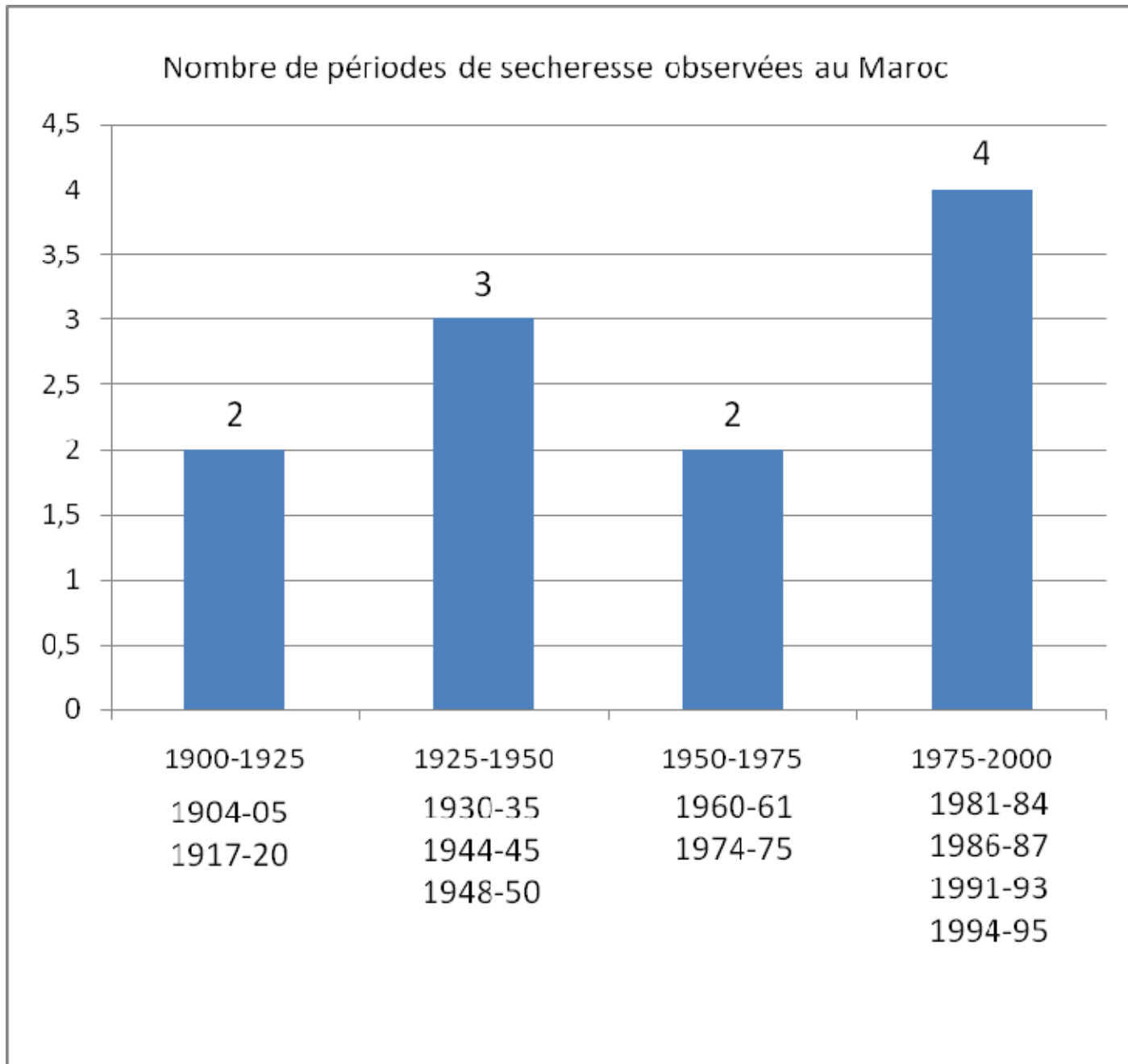


**Morocco is a highly water stressed country with erratic rainfall and frequent droughts.**

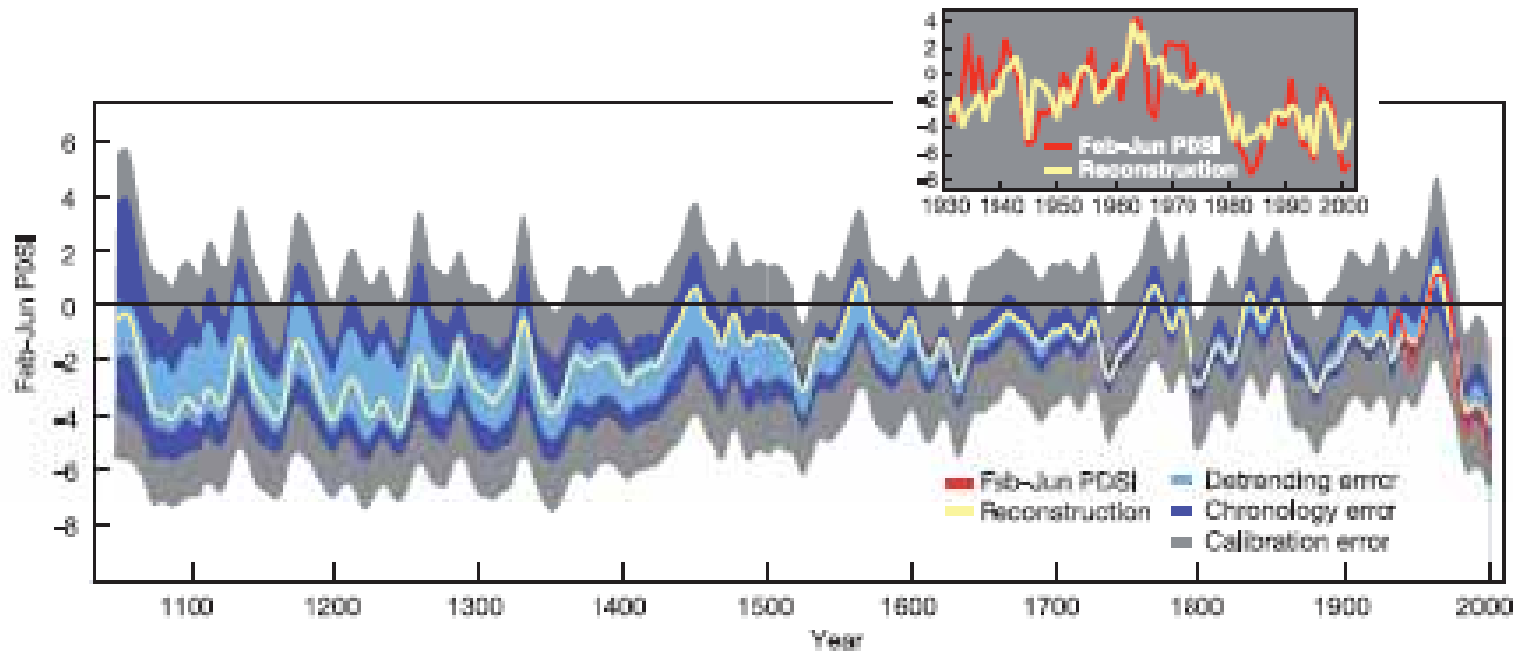
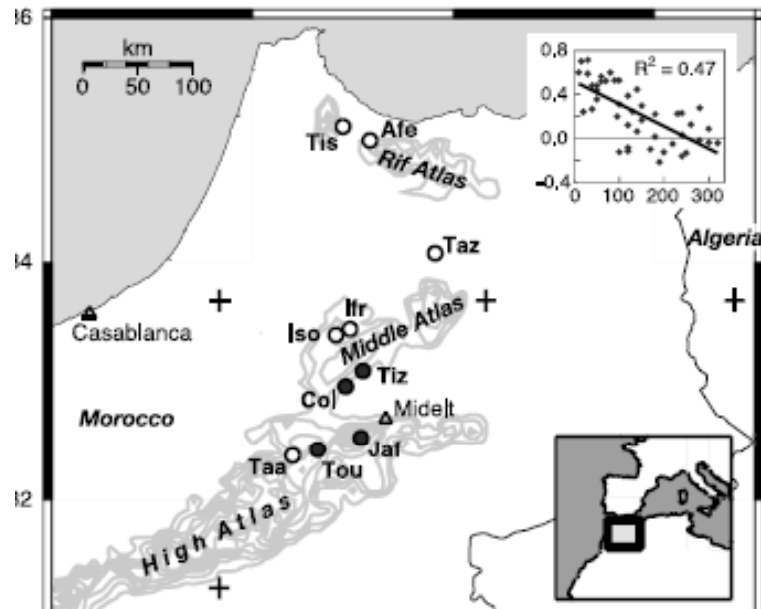
**The country is reaching the end of the water development era. Water resources management is therefore shifting to the more difficult task of ensuring economically, socially and environmentally efficient water allocation within the existing water resources constraints.**



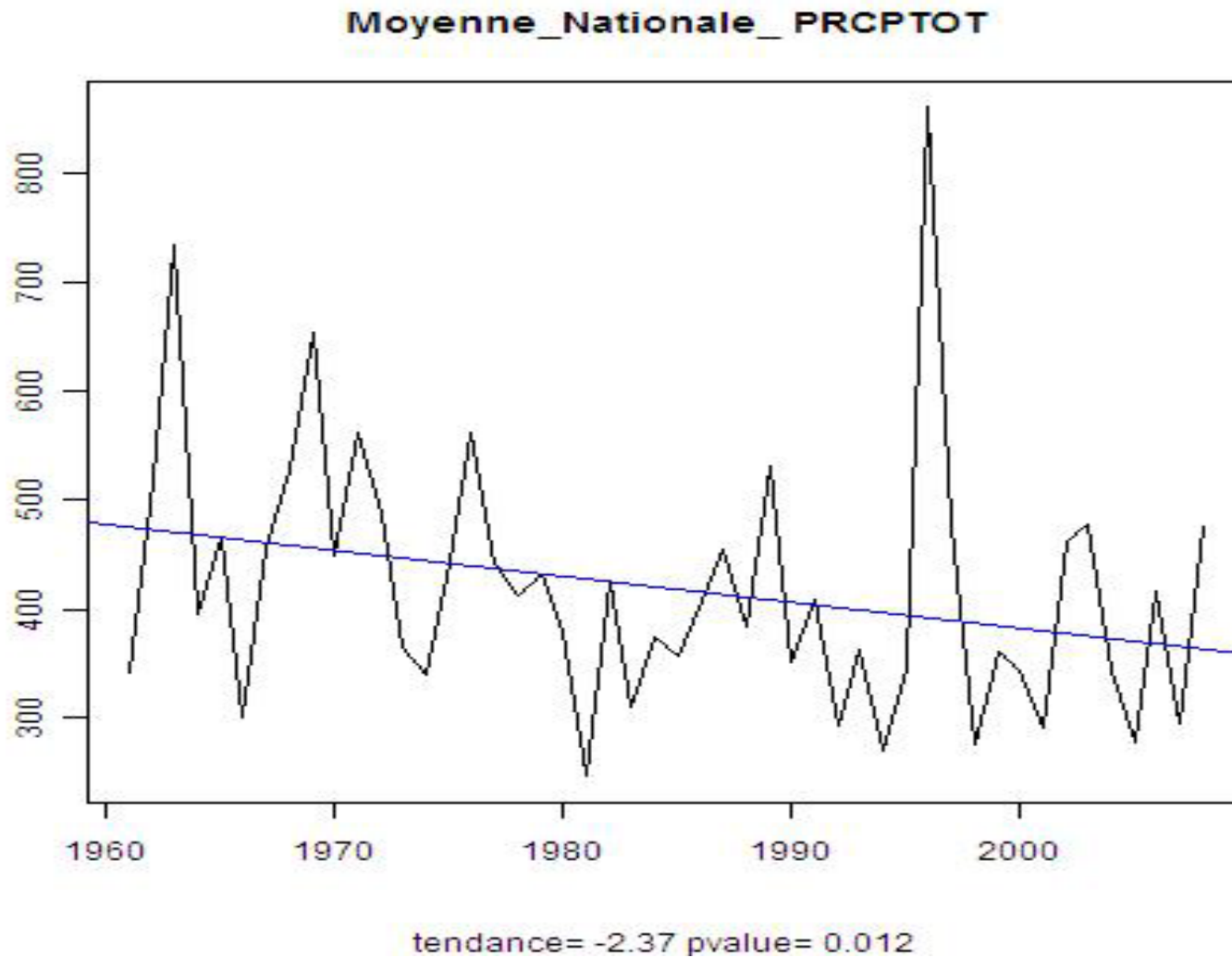
# Increasing Frequency & Severity of Droughts



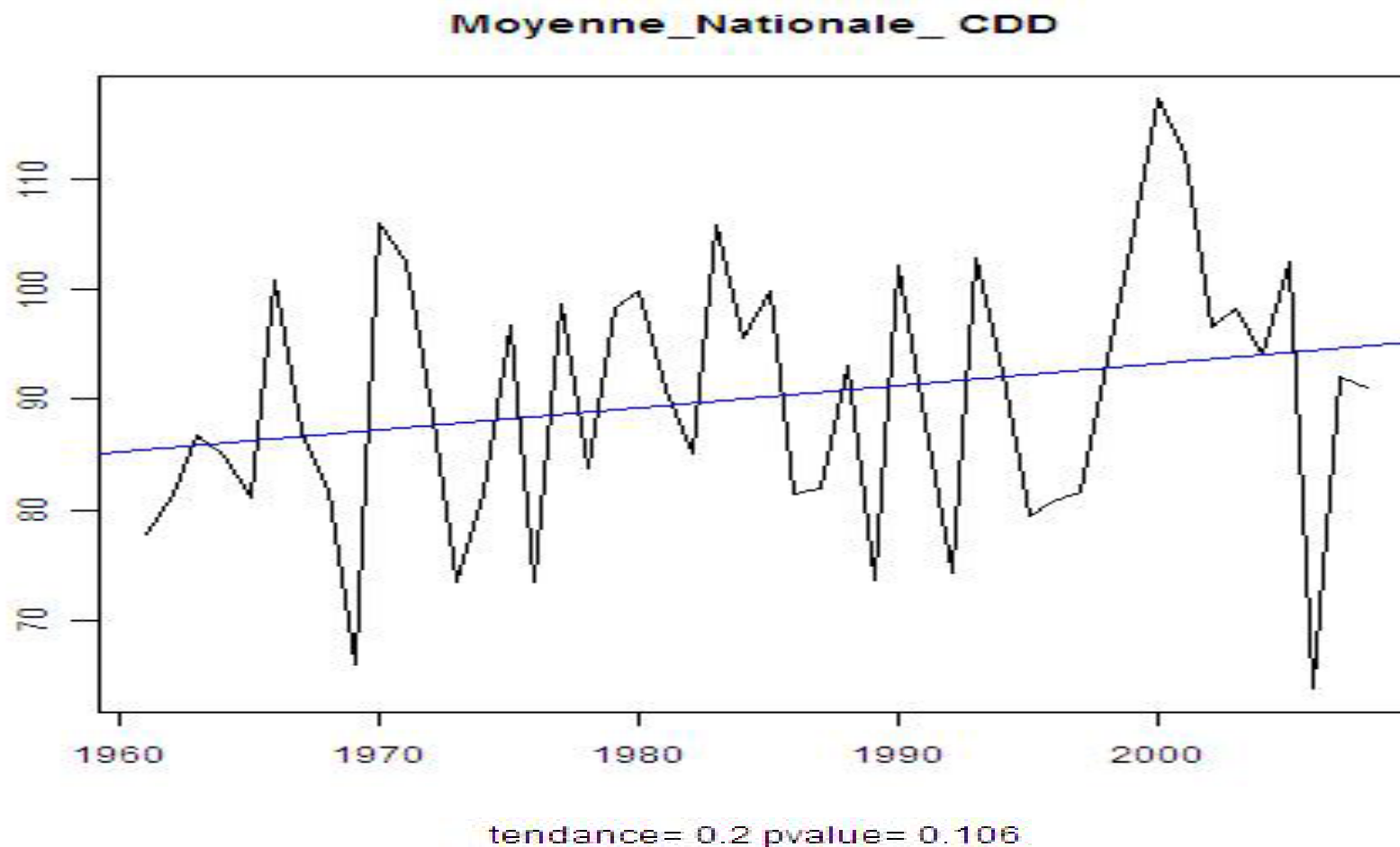
# Drought Severity Variations in Morocco



# Decreasing Precipitation



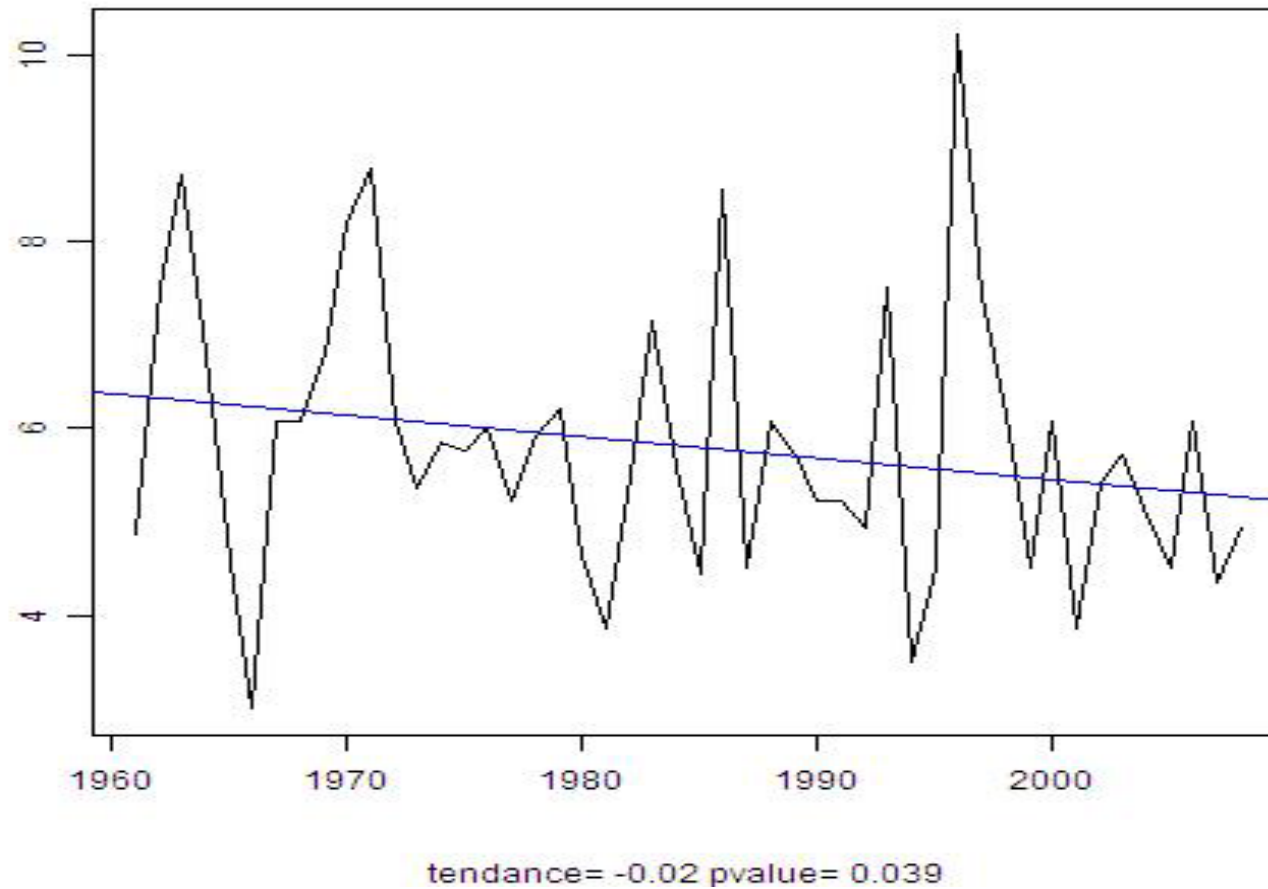
- une rétrogradation statistiquement significative de 2.37 mm par an est enregistrée, soit plus que 113 mm sur 48 ans.



*Durée maximale des jours consécutifs secs RR < 1 mm (Maroc)*

- Allongement de la durée maximale des jours consécutifs secs dépassant les +9 jours en 48 ans.
- Cette durée s'est accrue qu'à partir de 1995, d'une façon claire enregistrant ainsi la valeur maximale en 1999 de 117 jours .

### Moyenne\_Nationale\_CWD



#### Durée maximale des jours consécutifs humides $RR > 1$ mm (Maroc)

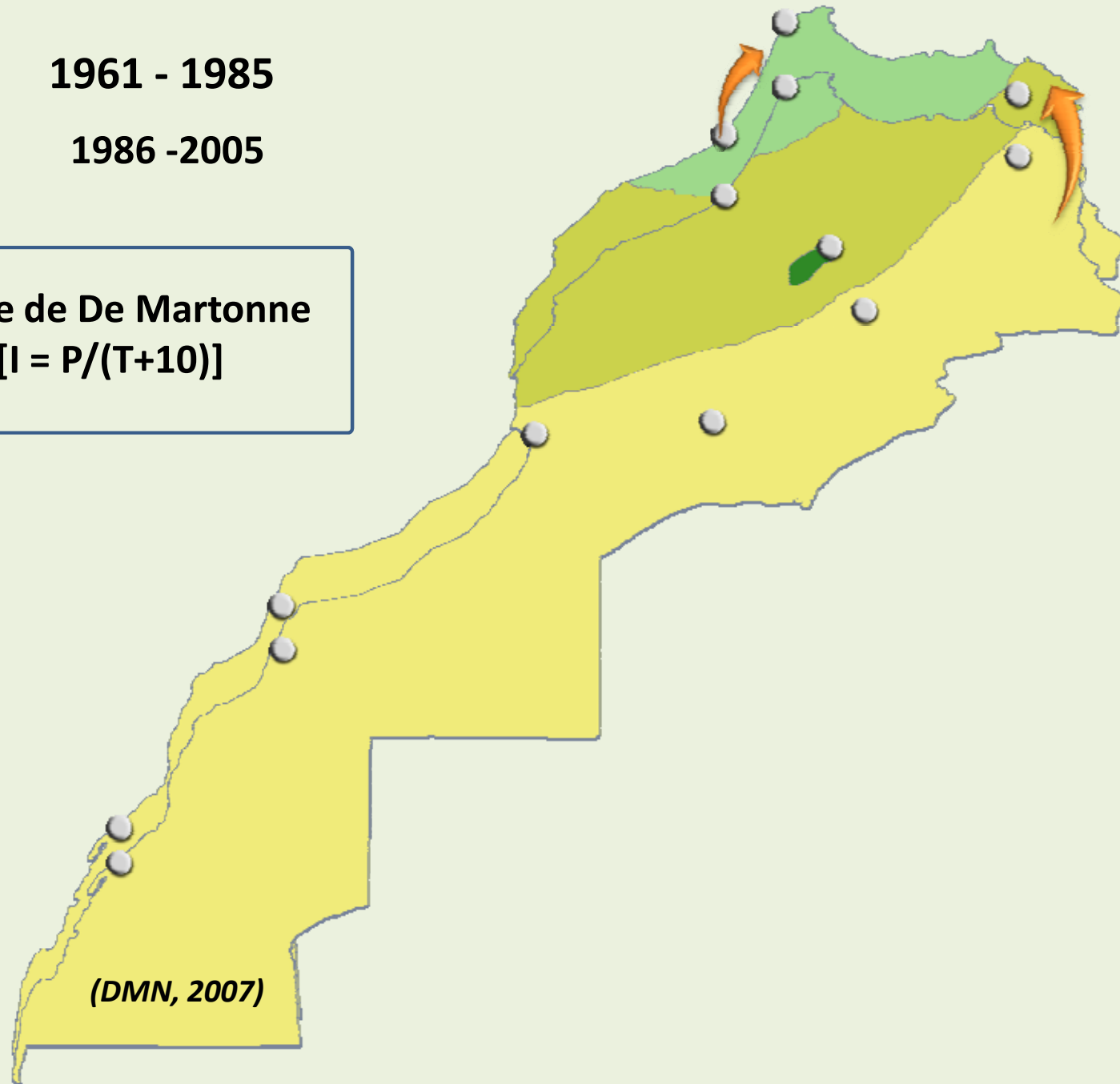
- une baisse significative de la durée maximale des jours consécutifs humides de -0.02 jours par an

# EXPANSION OF ARIDITY

1961 - 1985

1986 - 2005

Indice de De Martonne  
[ $I = P/(T+10)$ ]

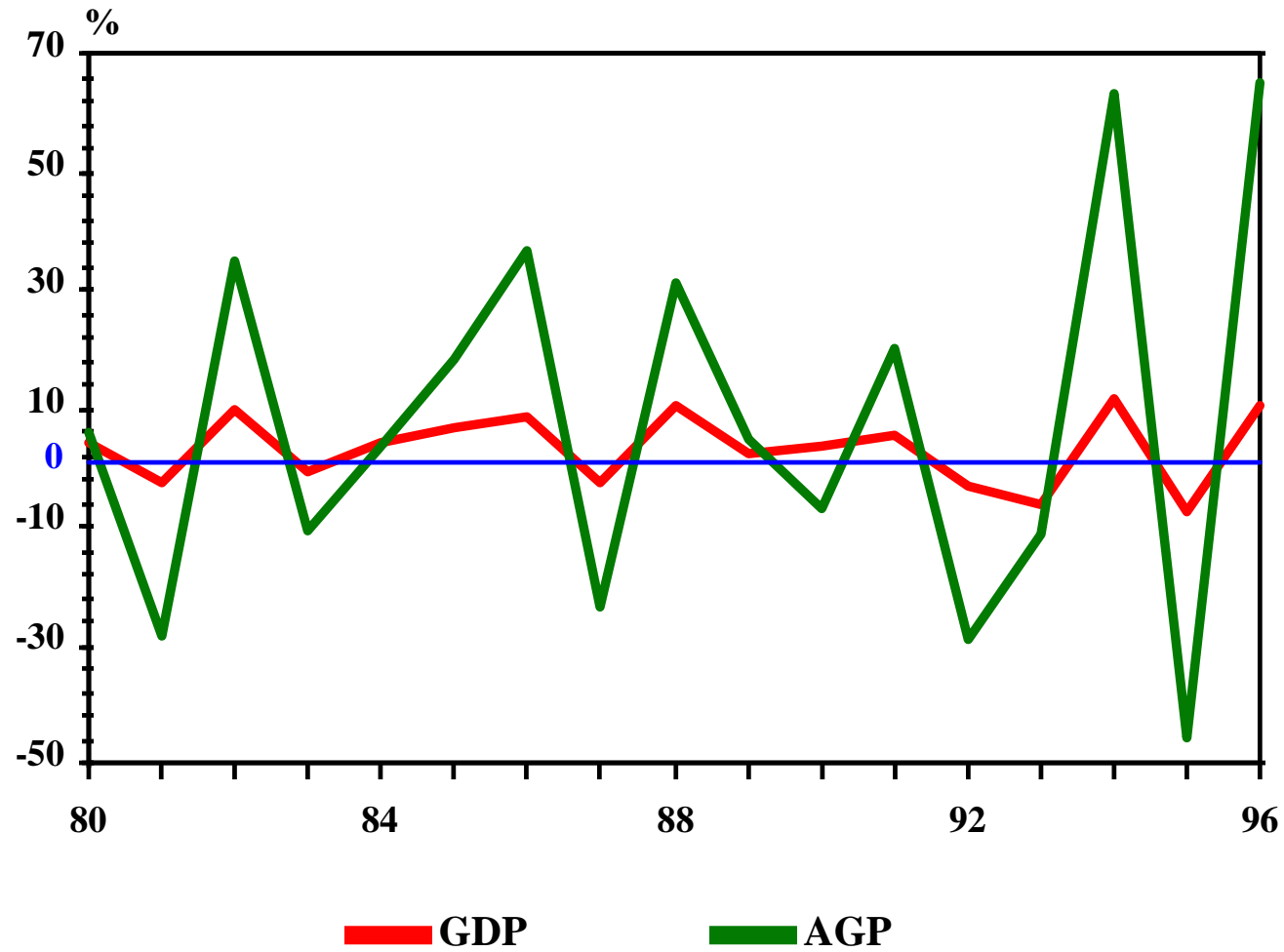


Climat

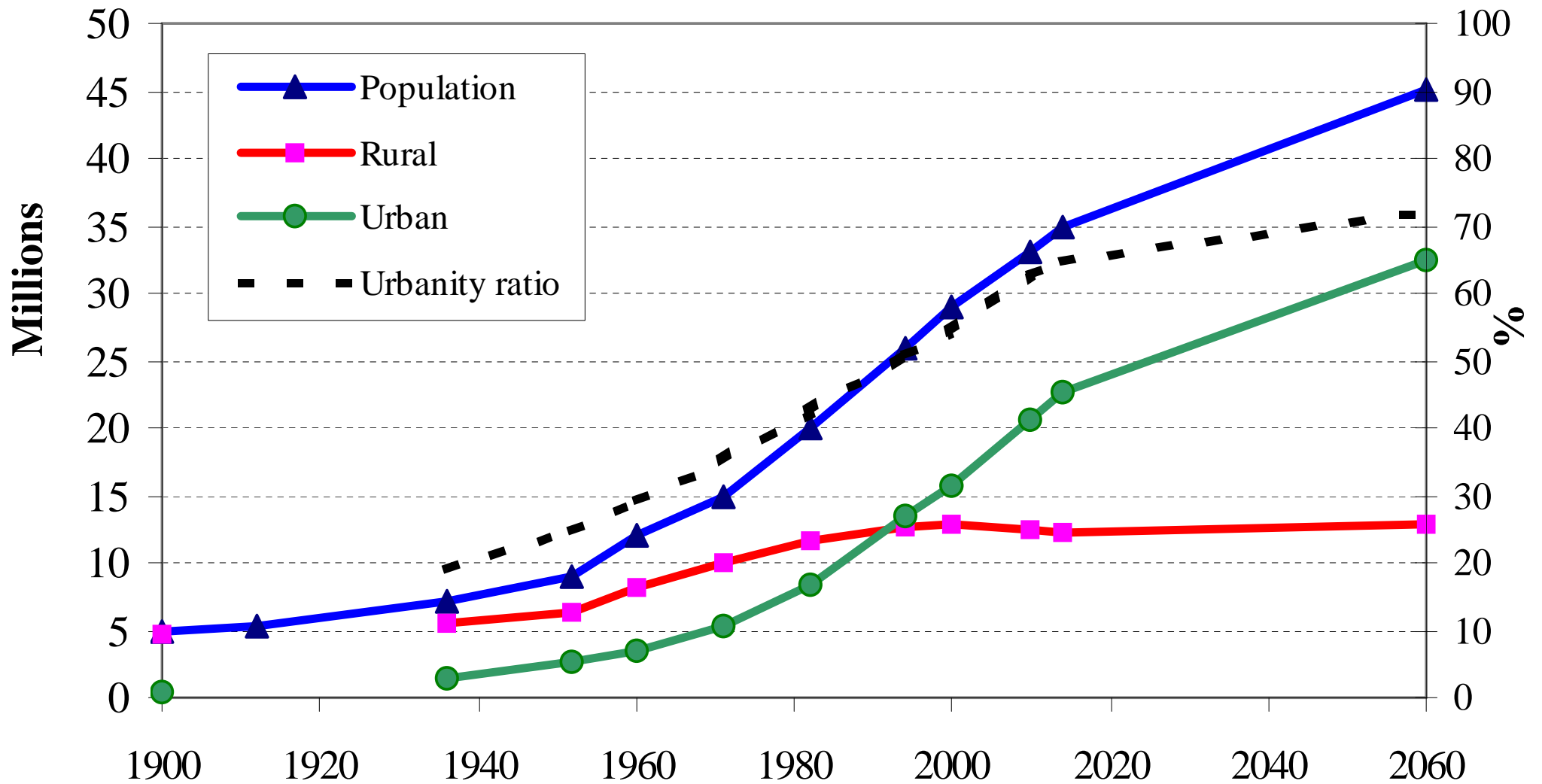
- Humide
- Subhumide
- Semi-aride
- Aride

Source: A. Lhafi, HEFLD

# Fluctuation of AGP and GDP

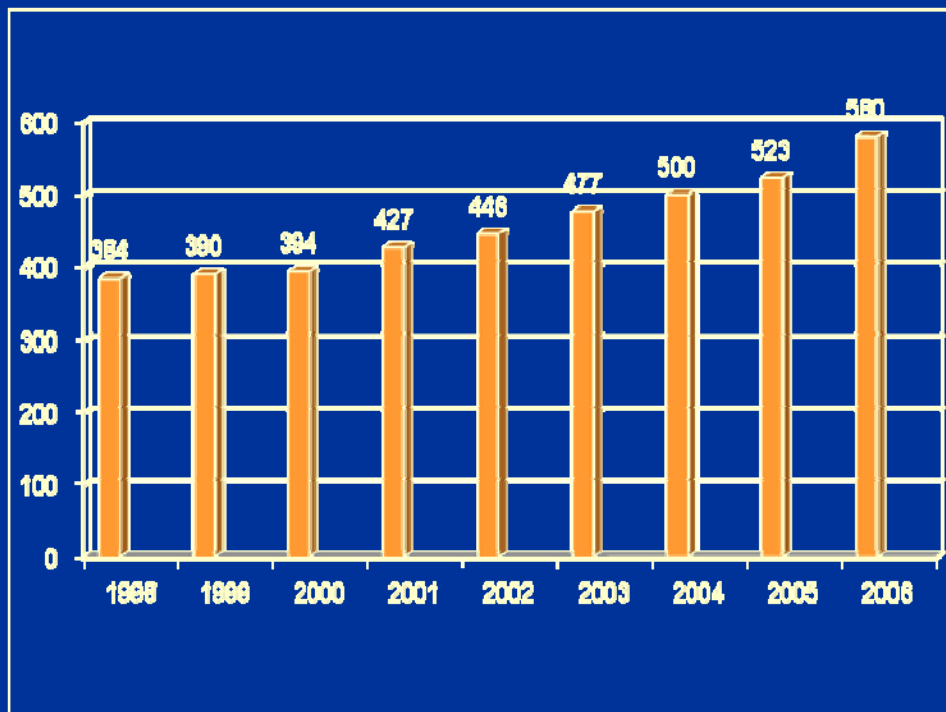


# *Morocco's Demographic Transition*



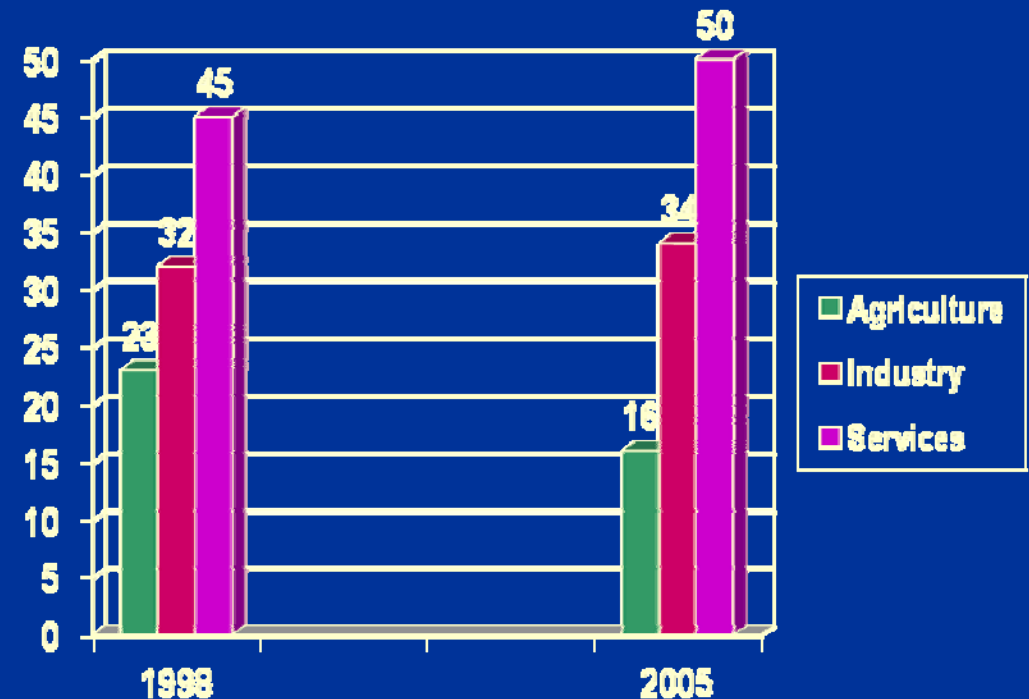
# Morocco's Economic Transition

## Morocco's GDP (BDH)

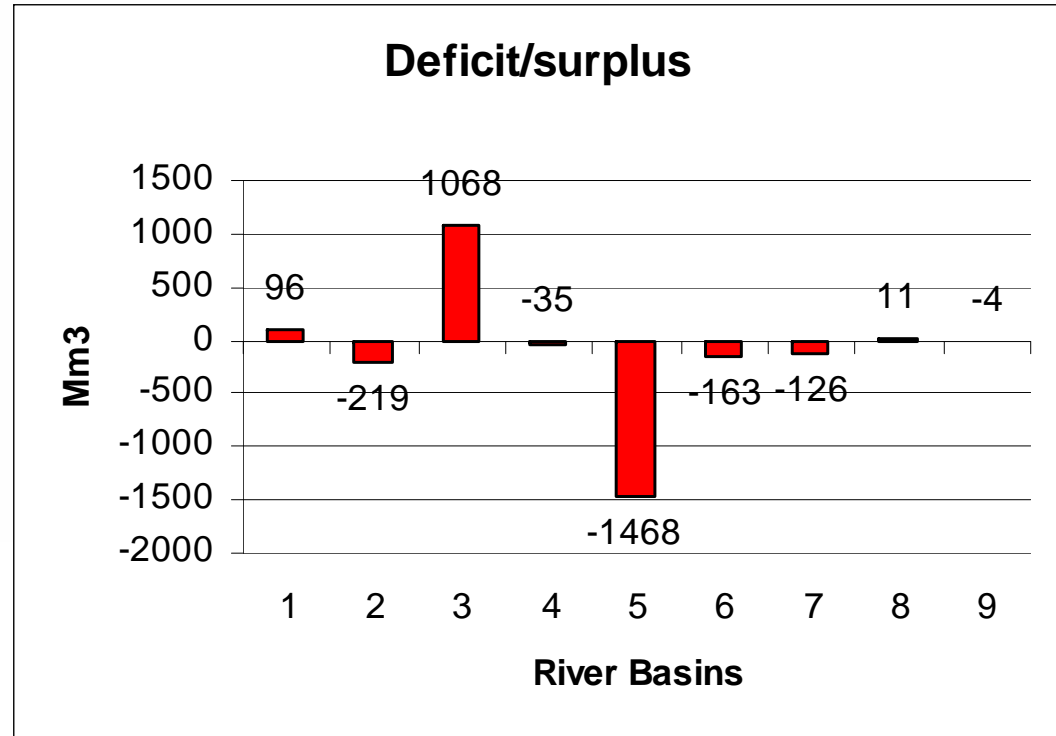
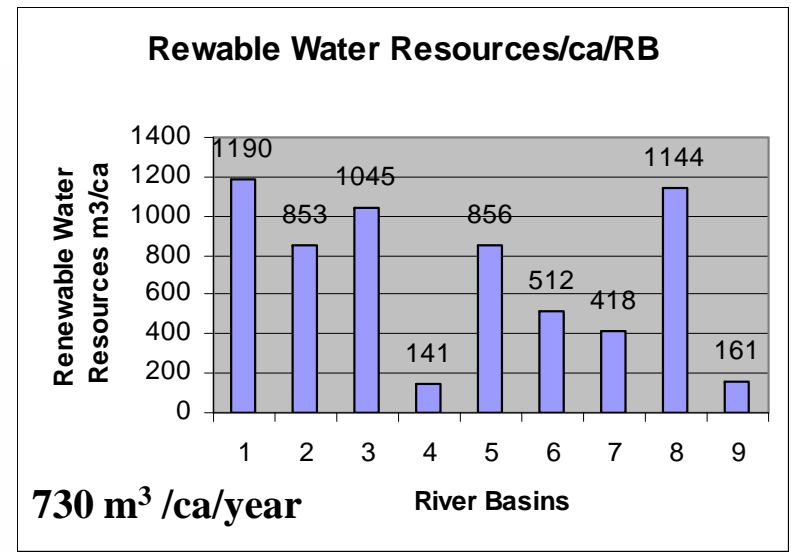
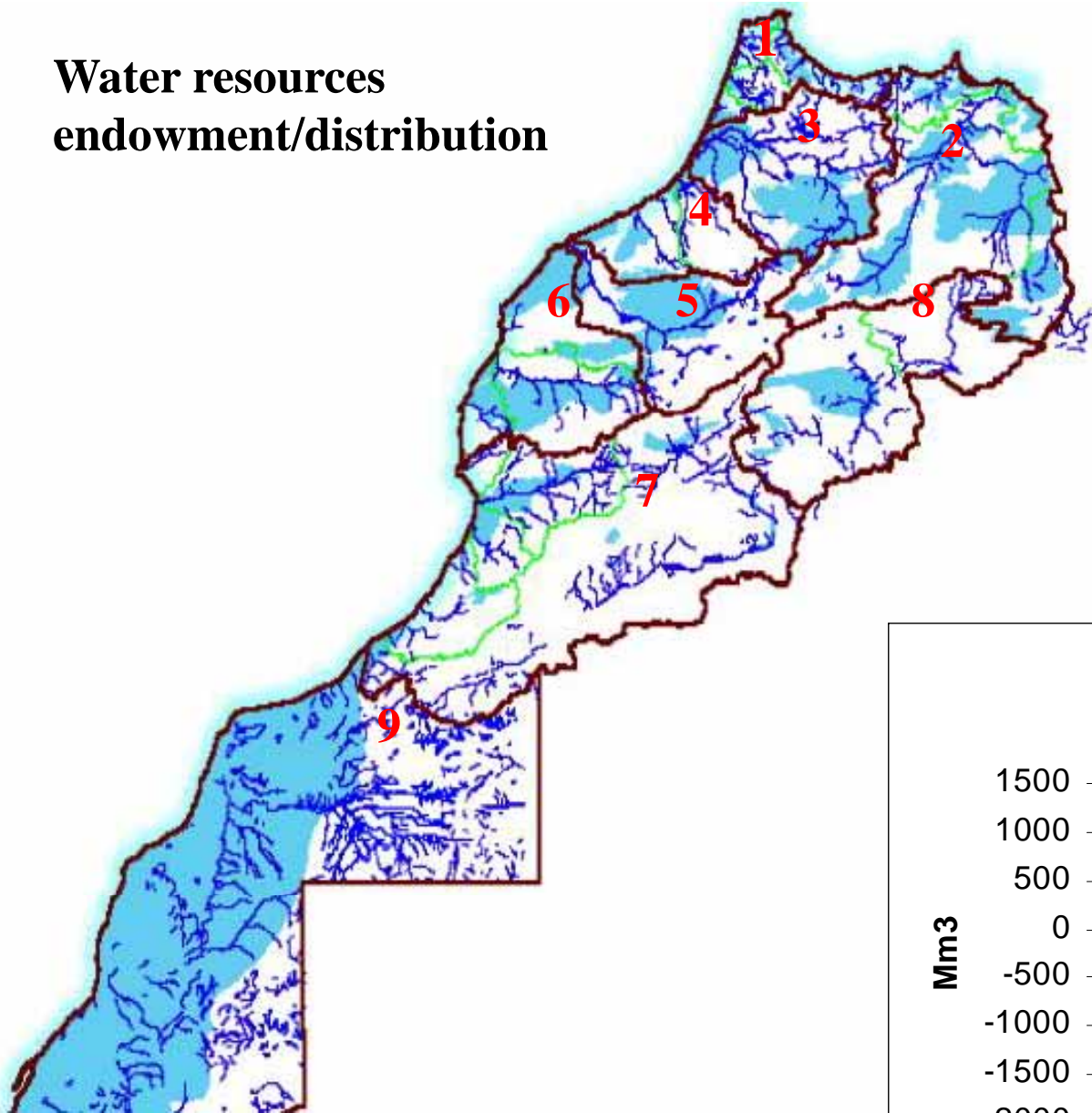


## Structure of the Economy

Share in GDP (%)



# Water resources endowment/distribution



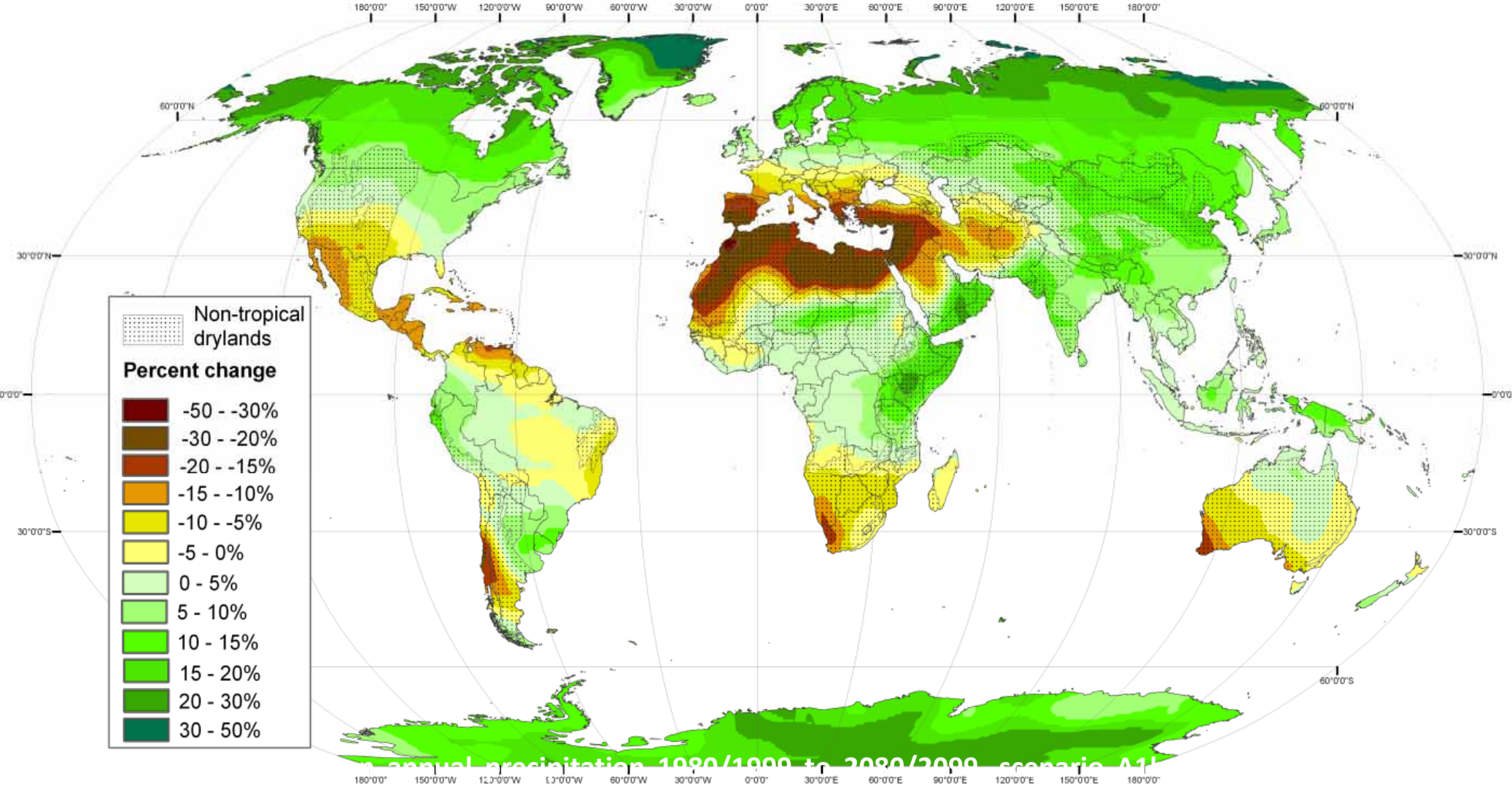
# Key Questions

- How much more irrigation does Morocco need to meet the future needs of a growing population?
- How to restructure consumption patterns from the present wasteful low value water intensive uses?
- How can farmers achieve a higher livelihood from every drop of water?
- What will the side effects on the rural community be by transferring water to cities? And what are the implications for food security?
- Does the import of food “virtual water” support food security and a more equitable and efficient allocation of water?

# Water Sector Reforms (1995)

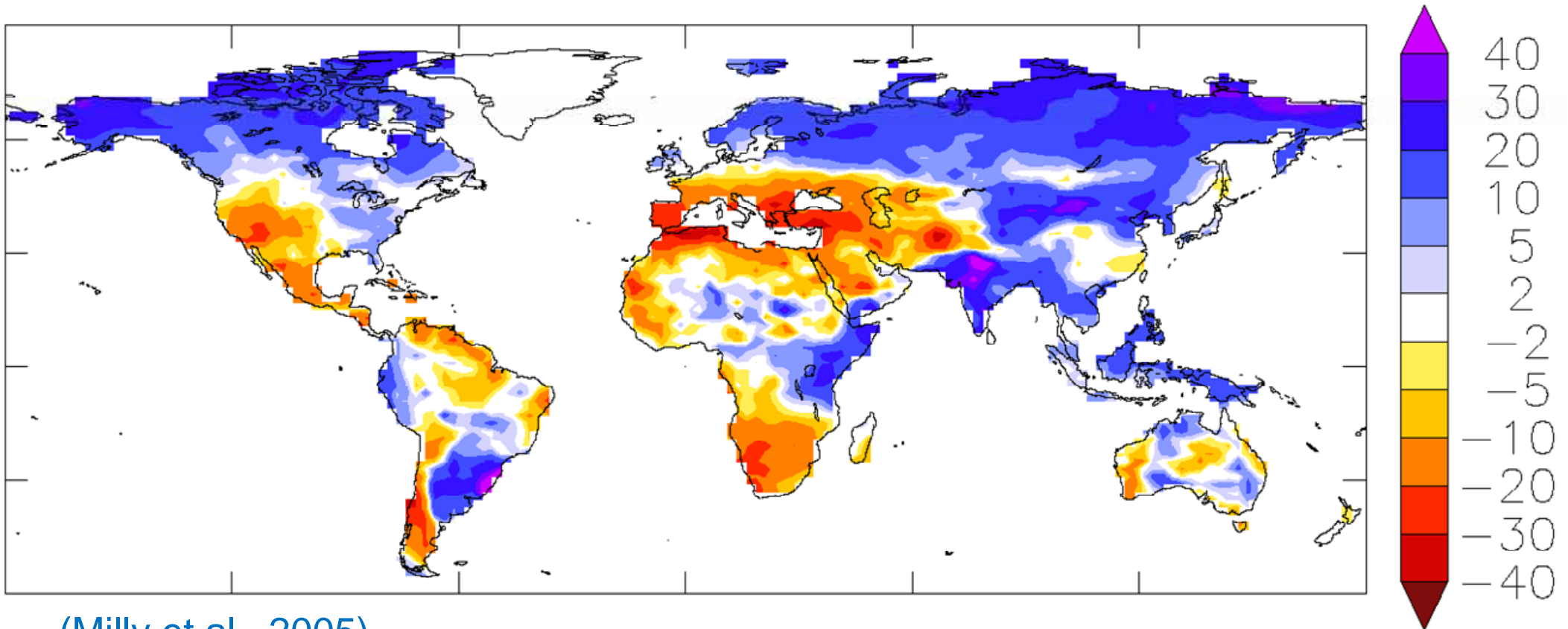
- The adoption of a long term strategy for an integrated water resources management;
- The development of a new legal and institutional framework to promote decentralized management and increase stakeholder participation;
- Introducing economic incentives in water allocation decisions through rational tariff and cost recovery;
- Taking capacity enhancing measures to meet institutional challenges for the management of water resources; and
- Establishing effective monitoring and control of water quality to reduce environmental degradation

# Relative change of mean annual precipitation 1980/1999 to 2080/2099



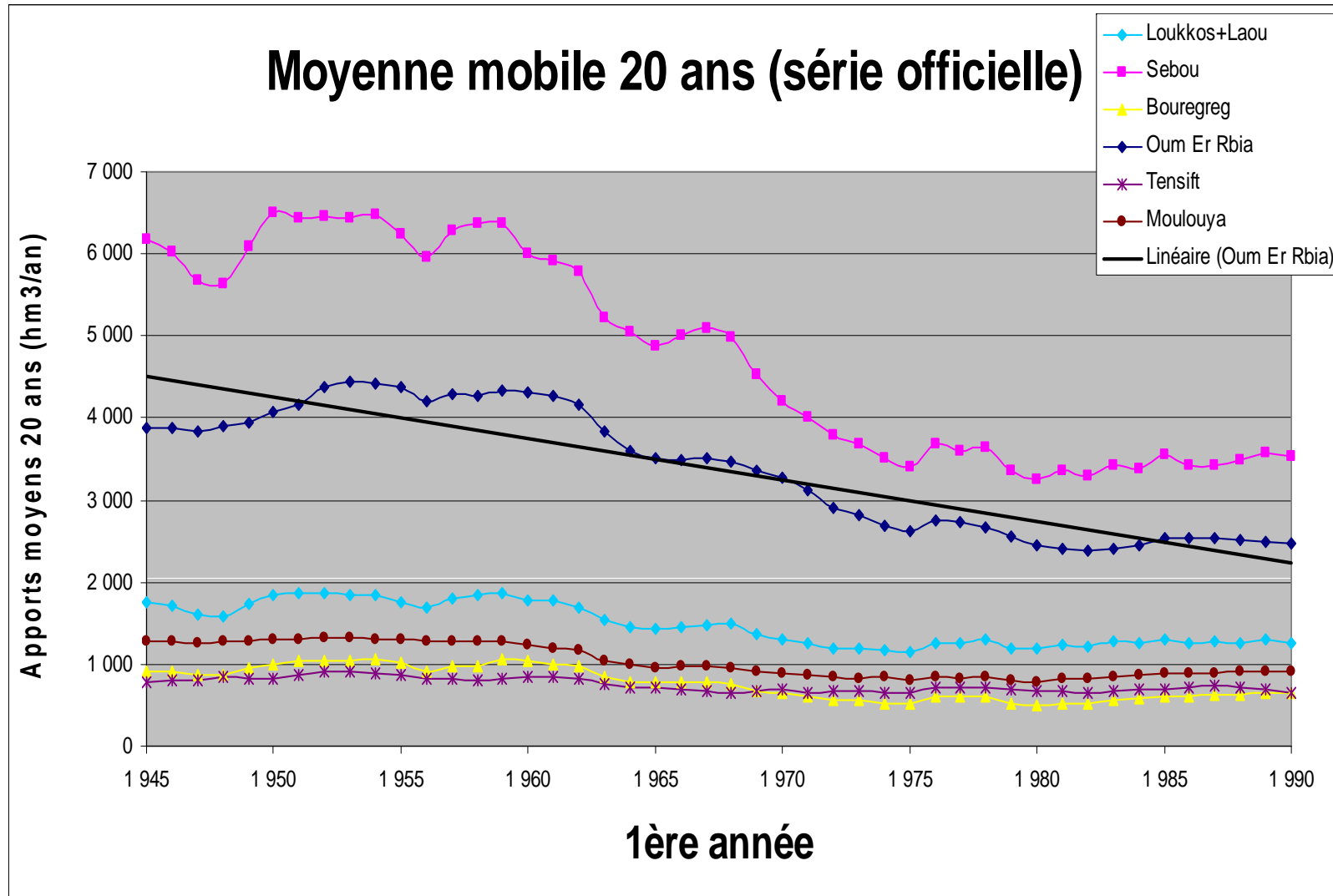
# Climate change impact on resources endowment & variability

Model-Projected Runoff Change (%)  
[(2041-2060)-(1900-1970)]

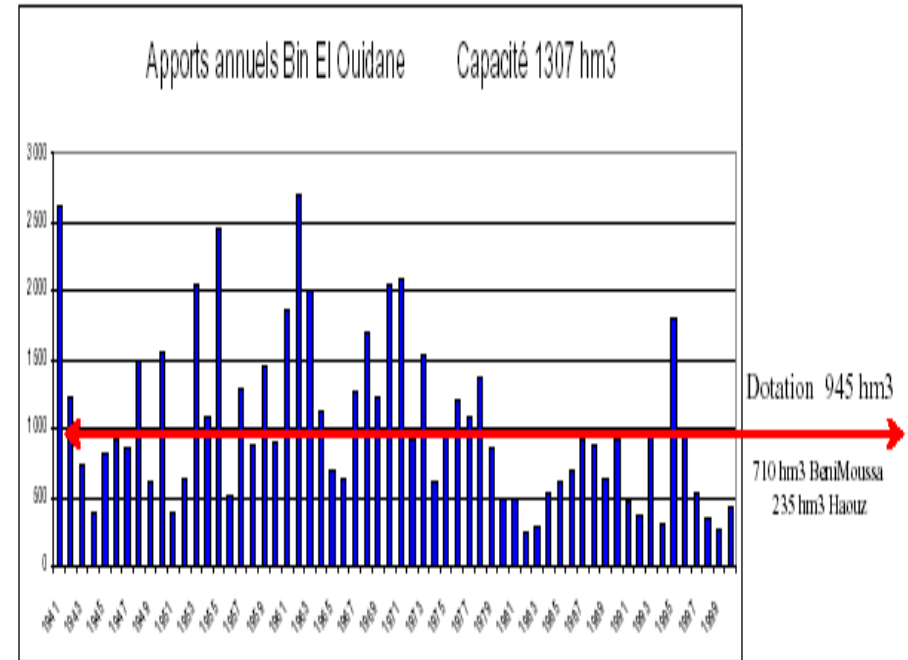
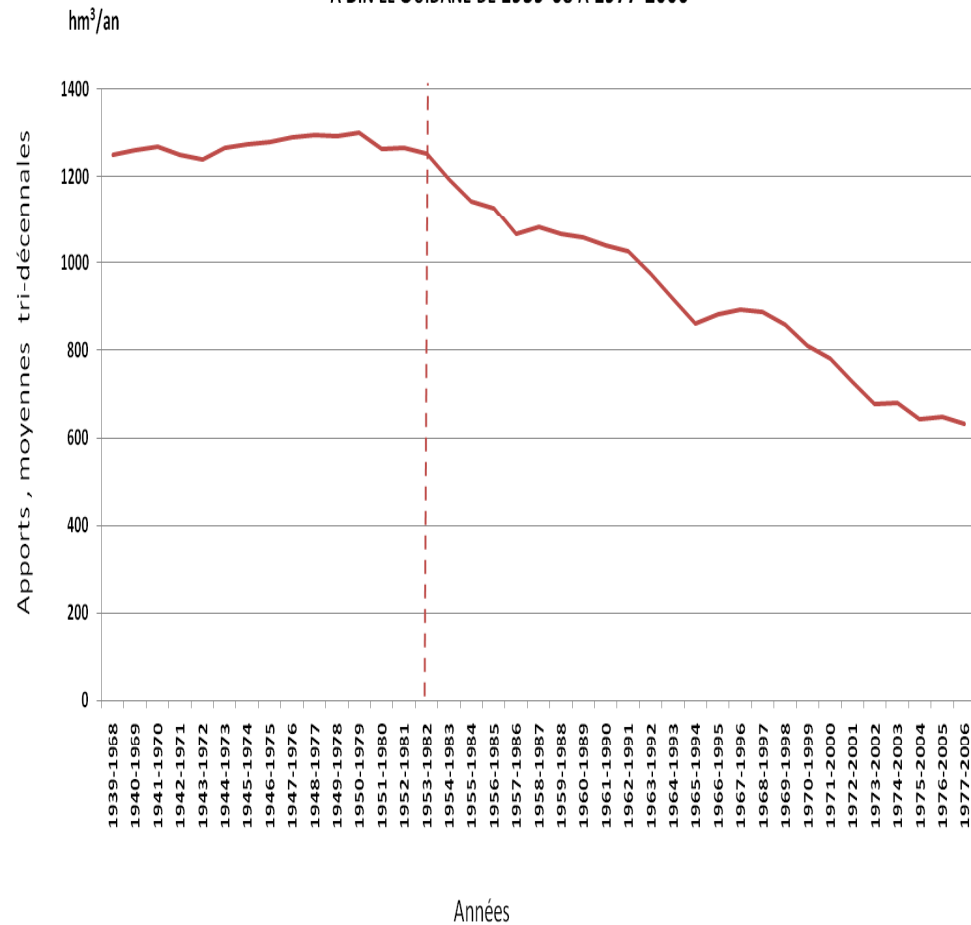


(Milly et al., 2005)

# Climate Shift 80s?



ÉVOLUTION DES APPORTS MOYENS TRI-DÉCENNAUX  
À BIN EL OUIDANE DE 1939-68 À 1977-2006



Série ancienne	39 ans	1941-1979	1250 hm³
Série longue	60 ans	1941-2000	1030 hm³
Série récente	21 ans	1980-2000	620 hm³

# IDM REQUIREMENTS

- Successful implementation of IDM requires a lot of data and strong analytical capacities

Data on all aspects (meteorological, hydrological, economic, social, environmental..) need to be strategically collected and more systematically monitored >>> **National Drought Observatory**

- Create a multistakeholder policy dialogue platform to address the drought challenge in a properly holistic manner >>> **High Water and Climate Council**