



# DROUGHT MANAGEMENT IN THE LOWER MEKONG BASIN

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# MAIN OBJECTIVE

“To present the drought episodes and problem analysis in the Mekong region as the background and justification for establishing a drought management programme under the regional framework for cooperation through the Mekong River Commission”

# Presentation Outlines

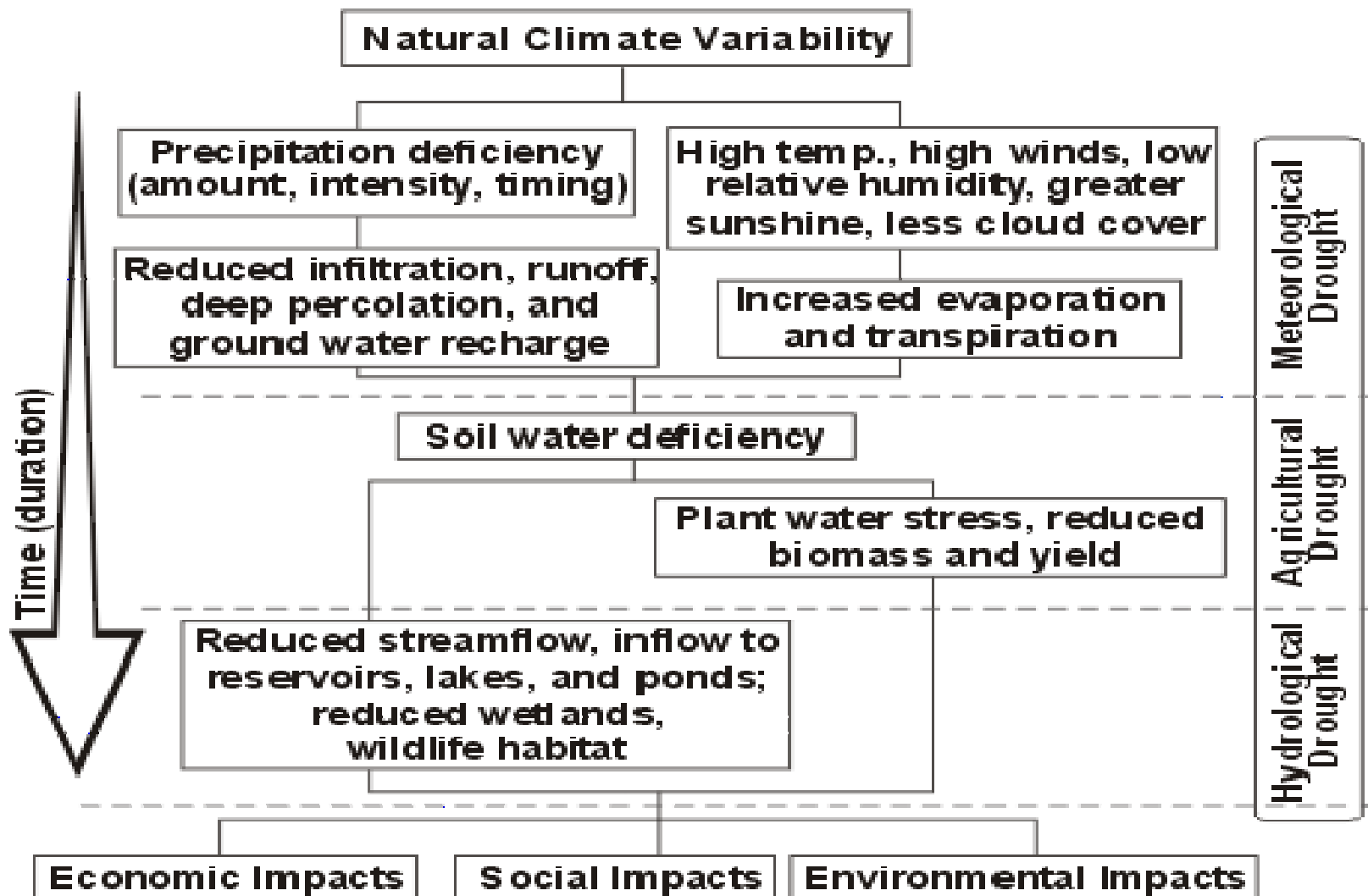
1. Introduction
2. Droughts in the Lower Mekong Basin
3. Problem Analysis
4. Management of drought
5. Conclusion

# 1. Introduction (1/2)



- ❏ Drought, by many considered to be the **least understood** of all major natural hazards.
- ❏ Drought has also been shown to be **the most costly** [Wilhite, 1993].
- ❏ Drought impacts are in general “**non-structural**”, unlike other hydro-meteorological extremes such as floods and typhoons.
  
- ❏ Compared to other natural hazards, droughts are much more **widespread geographically**.
- ❏ The severity of a drought is dependent not only on **its duration, intensity and spatial extent** but also on the **specific environment and the economic activities carried out within that environment**.

# 1. Introduction (2/2)



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Figure 1. Overview of the linkages between drought types and their impacts, Adamson [2005]

## 2. Droughts in the LMB (1/5)



- © Drought events in the Mekong region in the last decade: 1992, 1993, 1998, and 1999.
- © Most recent drought event began in 2003 and generally lasted into 2005.
- © Though, some areas still had the water levels and flows lower than normal level until June 2006.
- © A report on the hydrological situation in the Mekong region has been called for by MRC to be presented at each of its governing body meetings.



# 2. Droughts in the LMB (2/5)

Oct 04-Dec 04

Jan 05-Mar 05

Apr 05-Jun 05

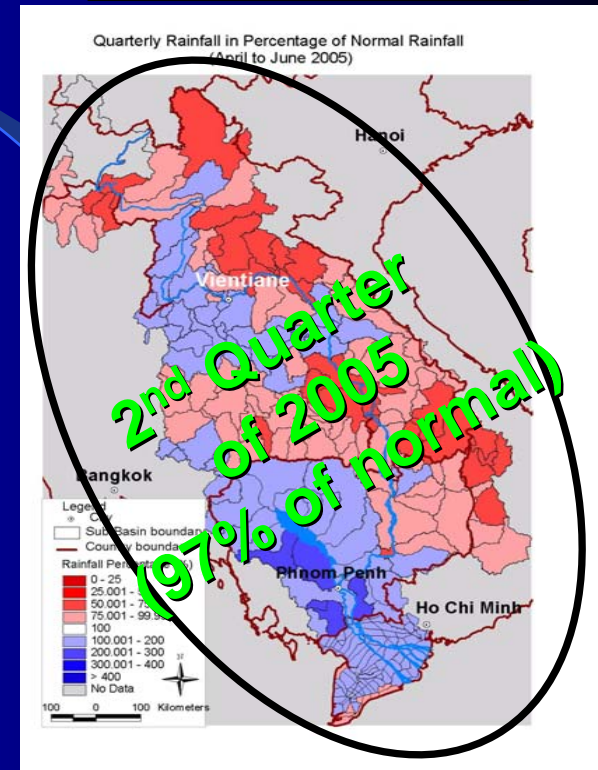
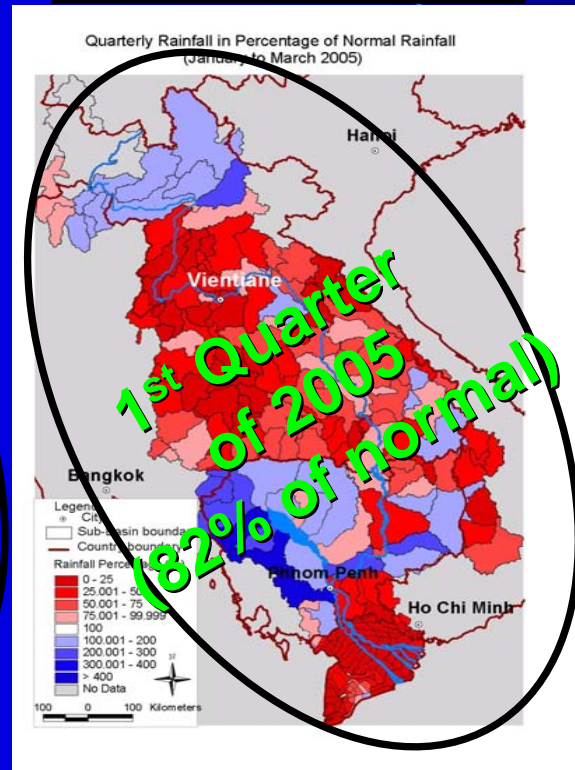
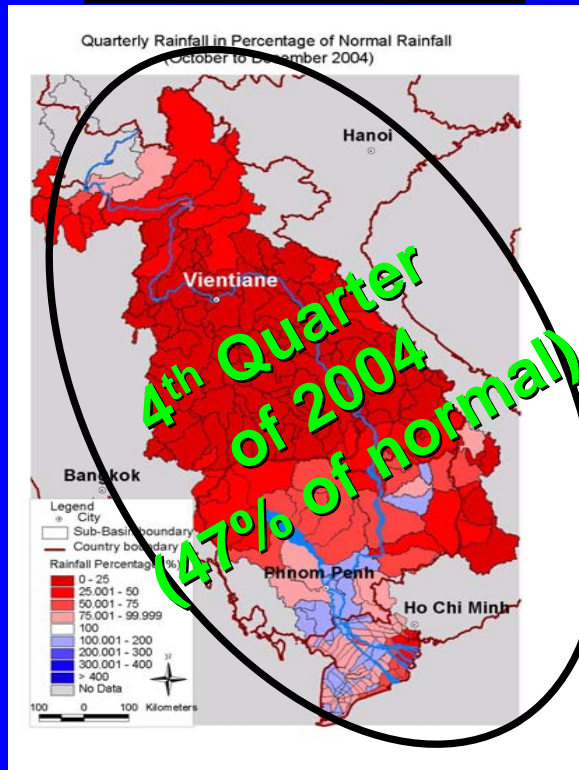
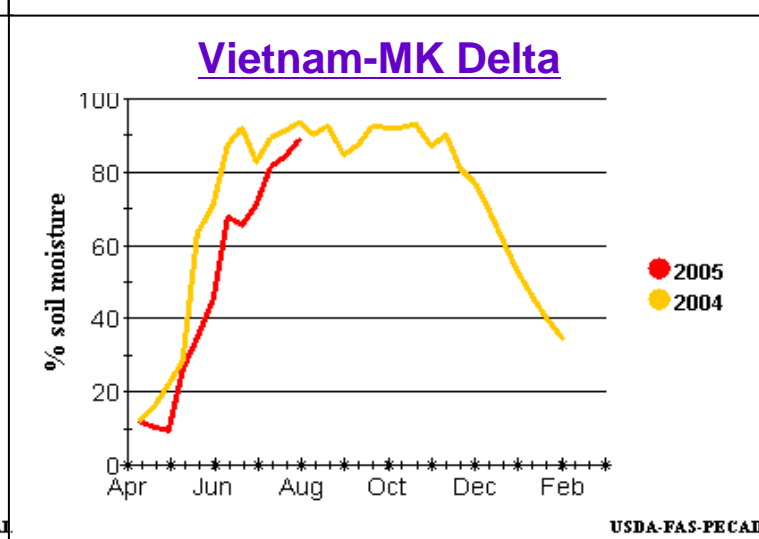
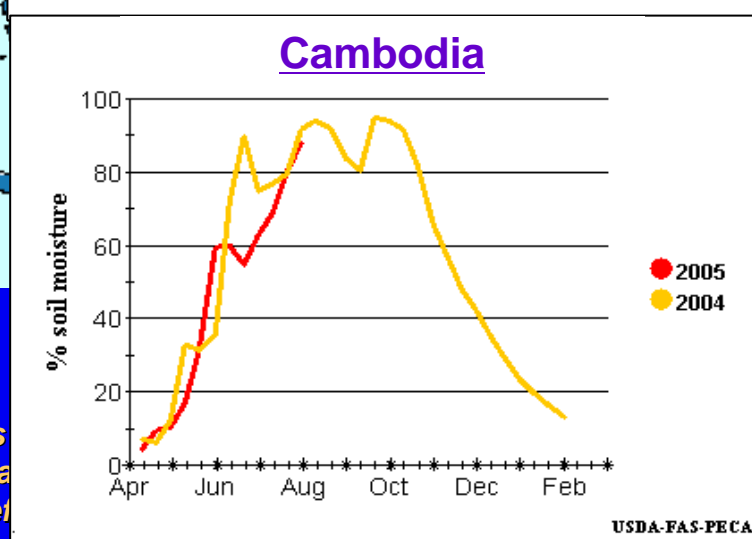
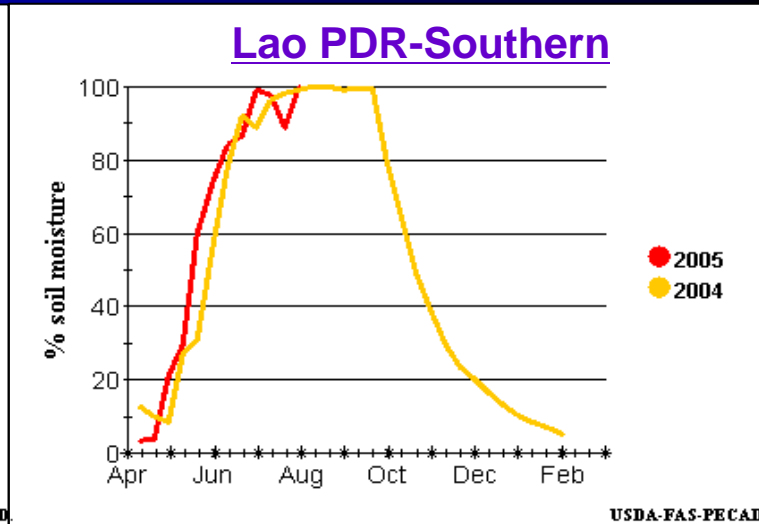
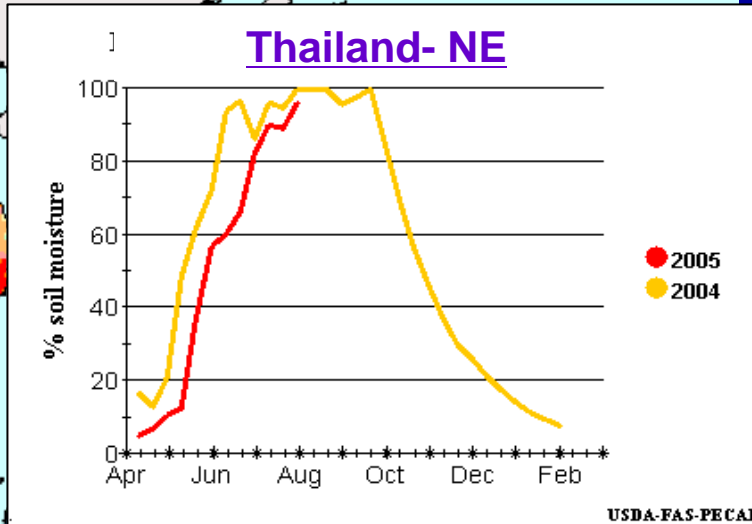
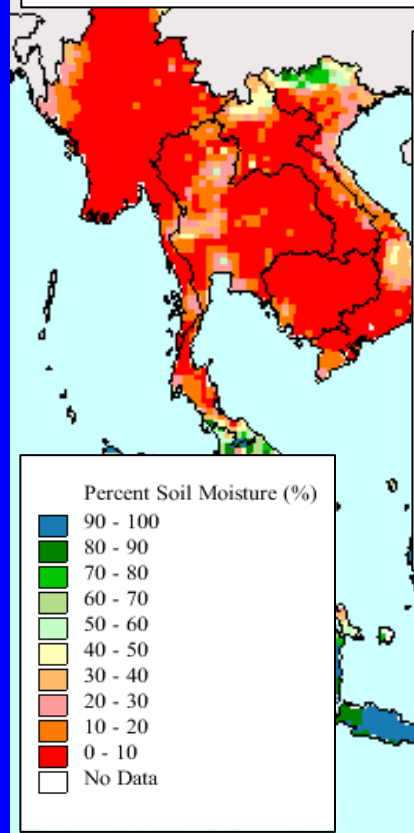


Figure 2. Quarterly rainfall as percentage of normal over the LMB sub-basins from October 2004 to June 2005.

# 2. Droughts in the LMB (3/5)



April 01-10, 2005



Percent soil moisture is plant divided by the total soil profile. It is used to determine if the soil profile has enough water for crop development.

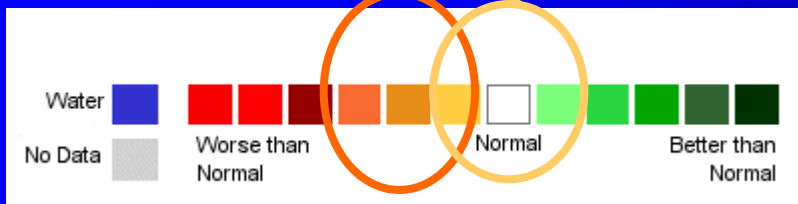
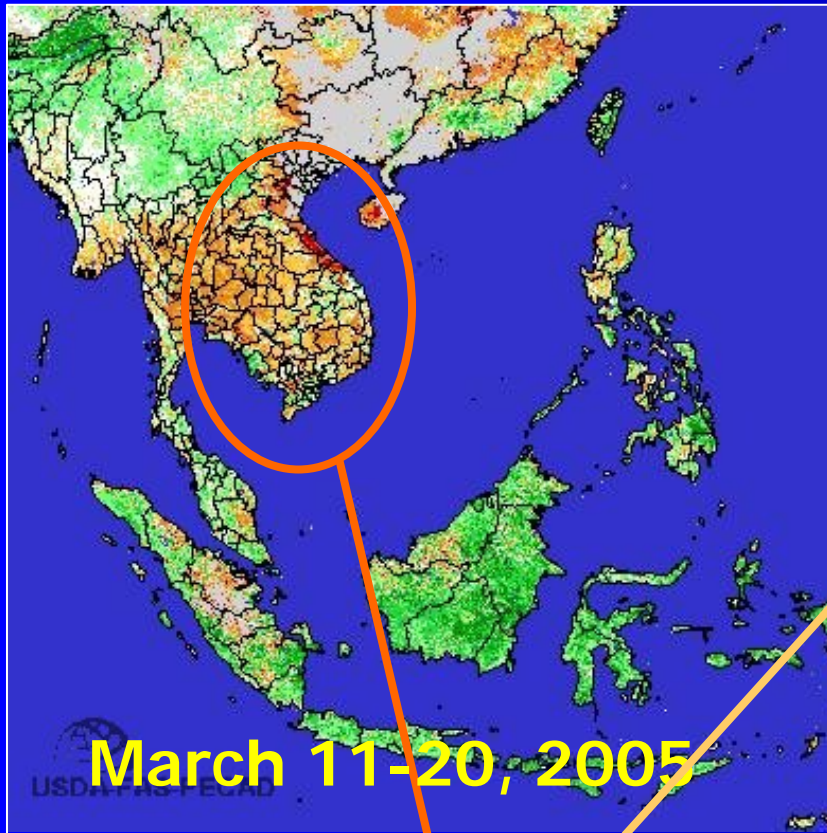
(Data source: <http://www.pecad.fas.usda.gov/>)



# 2. Droughts in the LMB (4/5)



## SE ASIA : INDEX OF CROP STRESS IN 2005



SPOT-veg NDVI Departure from 4-yr Average (derived from satellite imagery)

Source: USDA Website: [www.fas.usda.gov](http://www.fas.usda.gov)

## 2. Droughts in the LMB (5/5)

<i>Rainfall</i>	<i>Q4(Oct-Dec)2004</i>	<i>Q1(Jan-Mar)2005</i>	<i>Q2 (Apr-Jun)2005</i>	<i>Data sources</i>
<i>LMB (mm)</i>	<b>106</b>	<b>46</b>	<b>495</b>	<b>NOAA derived rainfall</b>
<i>Cambodia (mm)</i>	<b>205</b>	<b>50</b>	<b>563</b>	
<i>Lao PDR (mm)</i>	<b>50</b>	<b>63</b>	<b>499</b>	
<i>Thailand (mm)</i>	<b>18</b>	<b>32</b>	<b>445</b>	
<i>Vietnam (mm)</i>	<b>296</b>	<b>19</b>	<b>461</b>	
<i>LMB (%)</i>	<b>47</b>	<b>82</b>	<b>97</b>	<b>Normal rain is estimated from spatial rainfall distribution using rain gauge stations over the LMB (1985-2000)</b>
<i>Cambodia (%)</i>	<b>68</b>	<b>140</b>	<b>126</b>	
<i>Lao PDR (%)</i>	<b>29</b>	<b>88</b>	<b>82</b>	
<i>Thailand (%)</i>	<b>13</b>	<b>56</b>	<b>95</b>	
<i>Vietnam (%)</i>	<b>65</b>	<b>41</b>	<b>95</b>	

**Table 1:** Quarterly rainfall in % of normal rainfall in each country from Oct 2004-Jun 2005

# 3. Problem Analysis (1/3)



- The core problem identified from national baseline studies/consultation, and input of international experience.
- Core problem statement: *‘Increased vulnerability of people and water related resource systems to severe drought conditions in parts of the Lower Mekong River basin’.*
- Key aspect: it is not on the very occurrence of a drought in the basin, but on the *vulnerability of people and water related resource system to drought stresses.*

### 3. Problem Analysis (2/3)



**Four associated problem statements were developed.**

- **Insufficient availability of detailed information on the extreme variability of climatic and hydrological conditions in drought prone parts of the Lower Mekong River basin.**
- **Insufficient know-how of improved and tested drought preparedness, management and mitigation strategies.**
- **Mismatch of water supply and demand in drought prone parts of the Lower Mekong basin.**
- **An evolving enabling legal and institutional environment for effective drought management.**

# 3. Problem Analysis (3/3)

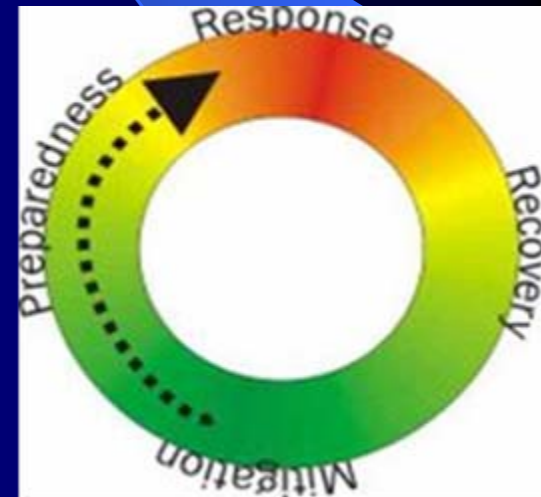


- ❑ **Based on the analysis of problems and main causes, it has identifies main areas, which are assumed as being affected by the core problem:**
  - **Increased poverty due to the resulting decline of local economic conditions.**
  - **Reduced sustainability and productivity of water and land related resource utilization and the environment.**
  - **Decline of social and institutional stability of the affected riparian populations.**



## 4. Management of drought (1/3)

- **Drought forecasting and early warning:** It contributes to reducing the negative impacts of droughts within a relatively short period of time.
- **Drought impact assessment:** A complex phenomenon, and its impacts result from numerous and widely varying causes, and therefore its assessment requiring integrated assessment of the economic/social/env. impacts of the vulnerable people and the water-related resources.
- **Drought preparedness and mitigation planning:** Preparedness and mitigation are two planning processes of emergency management.
- **Drought management policy environment:** The problem analysis identified the need for improved drought cooperation and policy alignment.





## 4. Management of drought (2/3)



- ✿ The MRC Strategic Plan 2006-2010 suggested the establishment of a Drought Management Programme (DMP) as part of the MRC programme portfolio.
- ✿ Through DMP formulation process it became clear that a coordinated effort of drought planning and management is needed at the regional level, promoting inter-governmental and inter-agency cooperation based on the IWRM principles.
- ✿ **Immediate Objective:** *'To establish effective drought awareness, preparedness, planning and management mechanisms in the LMB supported by the best available tools and know how, and facilitating and supporting the implementation of high priority national and regional programmes and multi-purpose projects'*.

## 4. Management of drought (3/3)

### Drought Management Components:

- ❑ **Drought Forecasting:** To improve the availability & quality of drought related data and forecasting information referring to the variable hydro-meteorological, agricultural & socio-economic drought conditions.
- ❑ **Drought Impact Assessment:** To improve generation, transfer and uptake of know-how of improved and tested drought management and mitigation strategies, which follow thorough technical & economic analyses of the causes of impact & vulnerability and benchmarked against impact and response indicators.
- ❑ **Drought Management Policy:** To enabling management and policy environment as a framework for improved cooperation between MRC, NMCs, partner organizations and the public.
- ❑ **Drought Preparedness & Mitigation Measures:** To close the gap between water supply & demand through planning and promoting implementation of appropriate structural/non-structural measures for mitigation of negative impacts.

## 5. Conclusion (1/2)



- ✓ **Rational for establishing the DMP within the MRC, given the catalyst of the severe regional drought conditions that prevailed during 2004 and 2005 and which resulted in significant socio-economic losses in all four countries.**
- ✓ **Multi national and regional river monitoring programmes extended to cover drought are in place such as the AHNIP and Mekong Hycos.**
- ✓ **The potential for linking drought and flood forecasting system are self evident (collection, dissemination and communication between countries, MRCS, stakeholders and relevant nat/regional organizations, etc).**

## 5. Conclusion (2/2)



- ✓ **There is much institutional expertise in place and considerable work in progress to improve drought management in the LMB.**
  
- ✓ **Four key emerging aspects of regional drought management and mitigation are:**
  - **Development of a regional drought forecasting and early warning method;**
  - **Drought impact assessment and monitoring;**
  - **Drought management policy formulation; and**
  - **Identification of regionally appropriate preparedness and mitigation measures.**

**THANK YOU  
FOR YOUR ATTENTION**