



# Meeting the Needs, Keeping the Balance

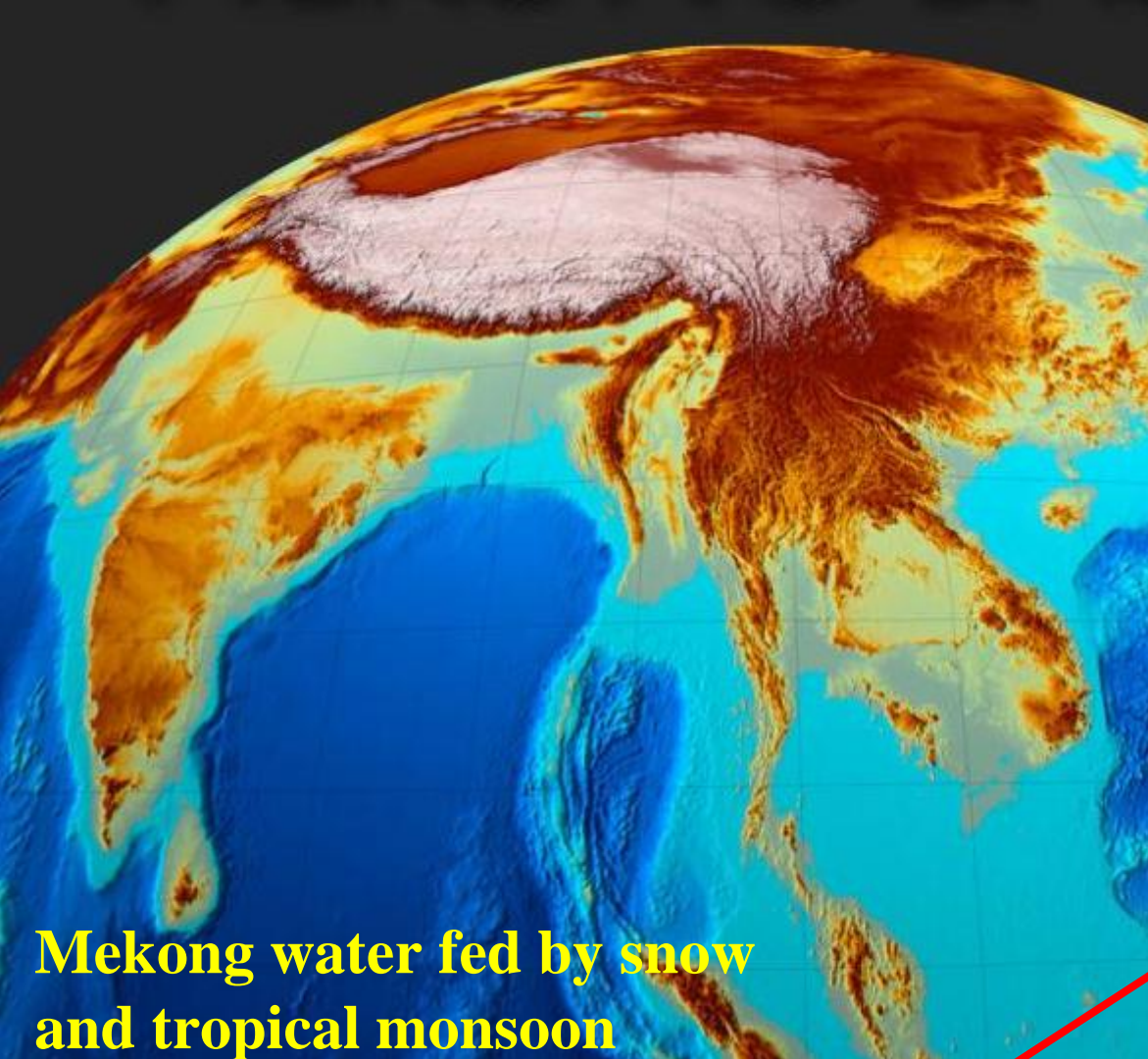
## THE MEKONG BASIN: DEVELOPMENT AND ENVIRONMENT CHALLENGES



# Outline:

- The Mekong and MRC contexts
- Challenge : Development
  - Hydropower
  - Irrigation and basin development
  - Navigation, trade and tourism
- Challenge : Environment
  - Flooding
  - Climate change
  - Environmental Health
  - Biodiversity
- Conclusion

# Geography of the Mekong basin



Mekong water fed by snow and tropical monsoon

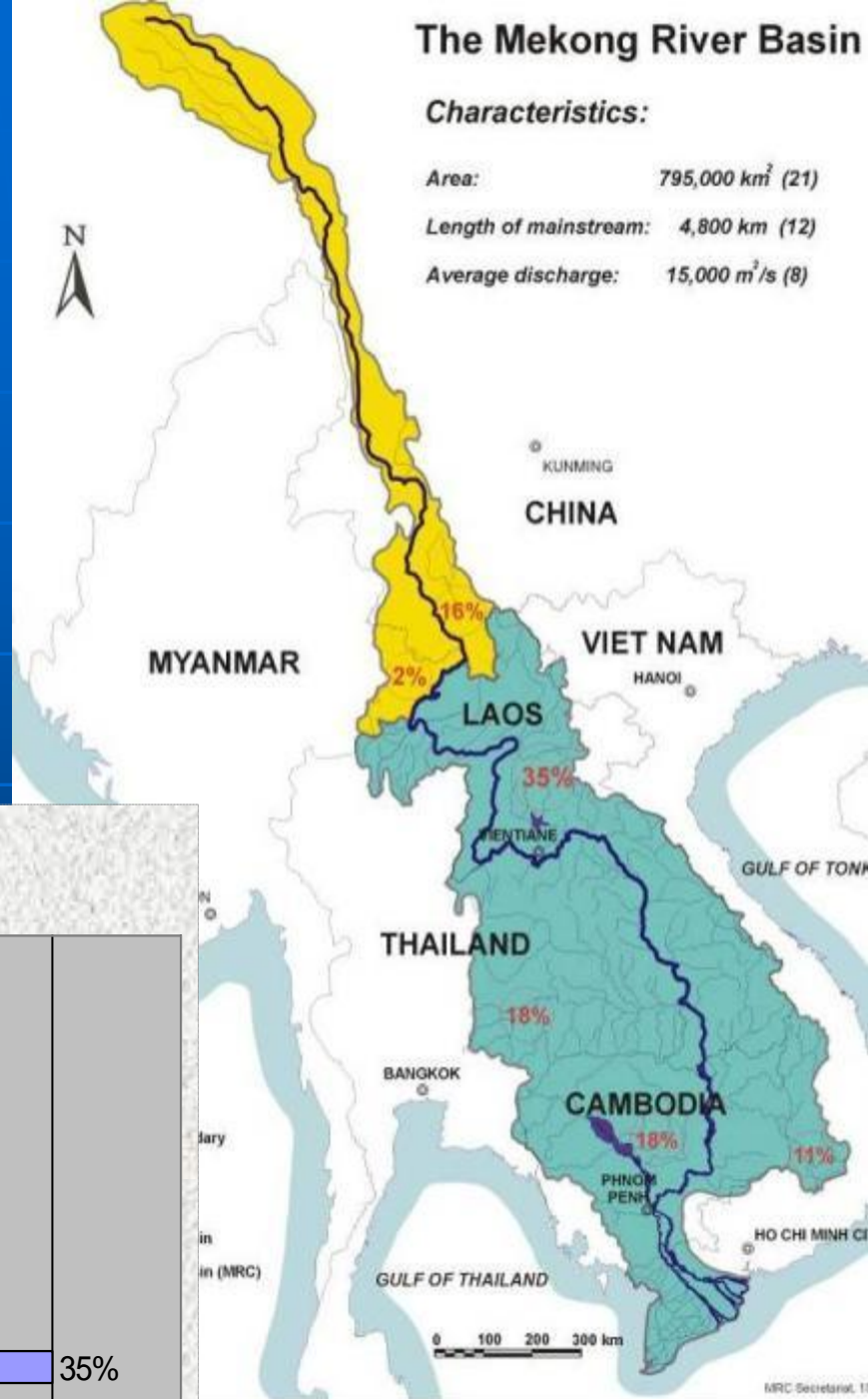
From Himalaya to the South China Sea

Seasonal flooding areas

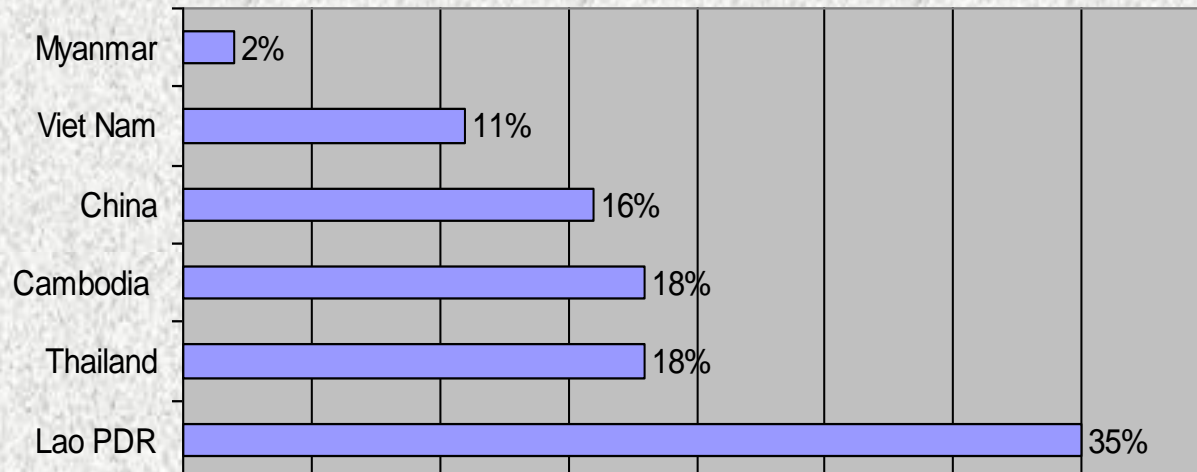


- The Mekong is 4,800 km long, world's 12<sup>th</sup> longest river
- Lower Basin home to >60 million people

- Global 8<sup>th</sup> highest average water discharge



**Contribution to flow:**



# The Mekong River Commission

Inter-governmental Organisation of the four Lower Mekong Basin countries aiming at developing and managing water and related resources



Set-up in 1995 emerging from initiatives starting in 1957  
Governed by the Water Resources Ministerial level and supported by the MRC Secretariat

## With Our Dialogue Partners



Government of China



Government of Myanmar

Mekong Committee																	Interim Mekong Committee										MRC																	
1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001

# WHAT ARE THE MRC ROLES

**complementary but independent**

**Work programme studies -used as guidance by government, developers, civil society.**

**Objective and independent assessment of proposals and advice to member governments, e.g. PNPCA (Procedures for Notification, Prior Consultation and Agreement)**

# Vision and key priorities of MRC

An economically prosperous, socially just and environmentally sound Mekong River Basin

- Poverty reduction
- Achievement of the MDGs (UN Millenium Development Goals)
- IWRM approach
- Addressing transboundary issues

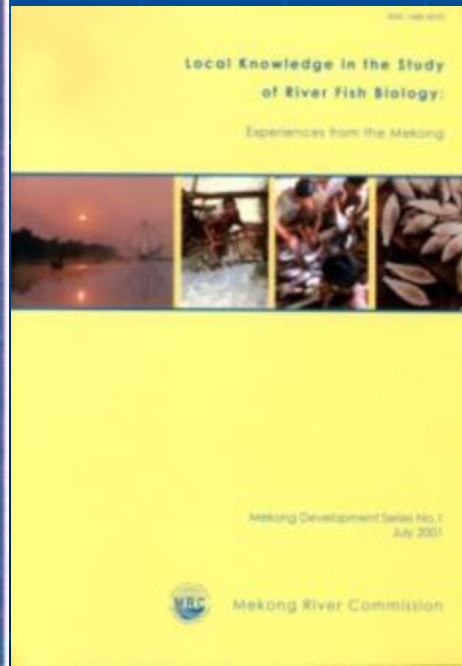


Since 1995, MRC has developed a solid foundation of procedures, data, models and analysis.



**AGREEMENT  
ON THE  
COOPERATION  
FOR THE  
SUSTAINABLE  
DEVELOPMENT OF  
THE MEKONG  
RIVER BASIN  
5 APRIL 1995**

MEKONG RIVER COMMISSION

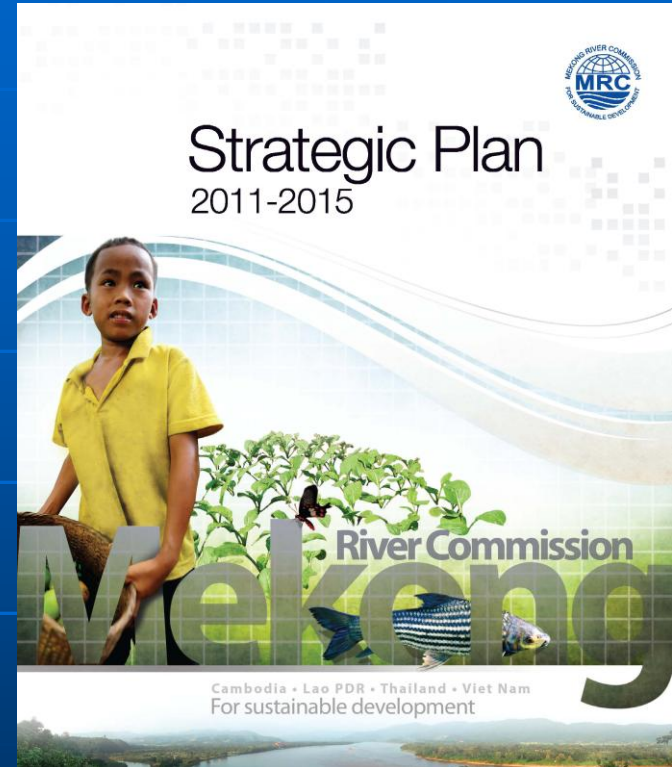


Local Knowledge in the Study  
of River Fish Biology:  
Experiences from the Mekong

Mekong Development Series No. 1  
July 2001



Mekong River Commission



Strategic Plan  
2011-2015

River Commission

Cambodia • Lao PDR • Thailand • Viet Nam  
For sustainable development



Fish Migrations

© COPYRIGHT MRC 2005





**Integration: multi-sector considerations**



# **Rapidly changing development context in the Mekong Basin**

**Underlying trends – growth in population, urbanisation, competition for resources, strong economic growth, growth in energy demand**

**Influence of global factors – climate change; periodic rises in oil, gas and food prices; high commodity prices**

**Availability of private sector finance and investment from regional countries**

**Future changes in Mekong flow regime from Chinese dams upstream**

**Leading to**

**Resurgence of interest in hydropower development as a renewable source of electricity, including on the Mekong mainstream**

**Increase in irrigation development to meet growing food demand from larger and more wealthy population**

# Challenges - Development

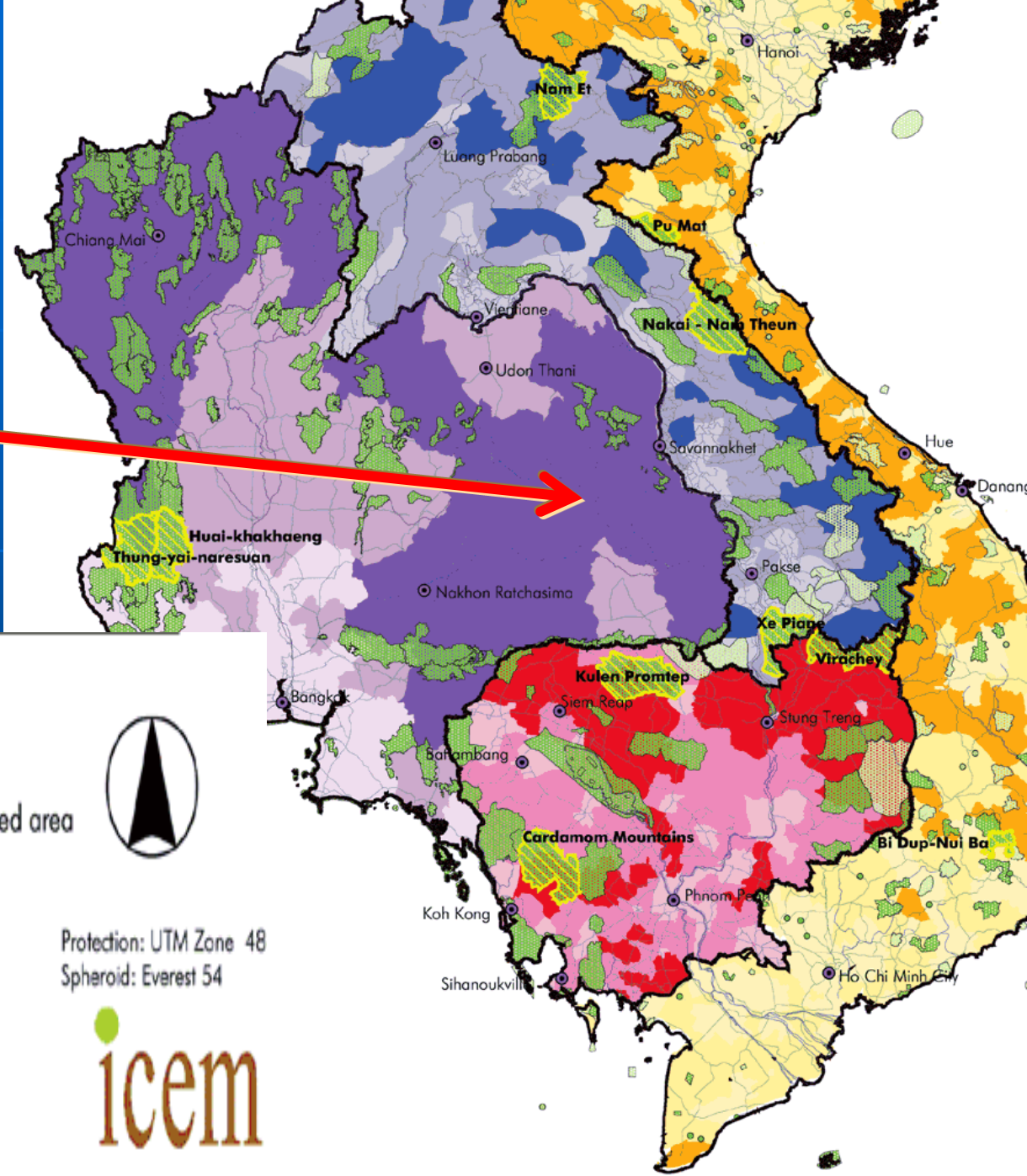
# Social conditions



*Living standards have generally increased but areas of poverty remain particularly in rural areas*



# Poverty rate still high in the basin



## Cambodia poverty ranking

- High
- Low
- Medium

## Lao PDR poverty ranking

- High
- Low
- Medium

## Thailand poverty ranking

- High
- Medium
- Low

- Cities
- Roads
- Protected area
- Proposed protected area
- Rivers

## Vietnam poverty ranking

- High
- Low
- Medium

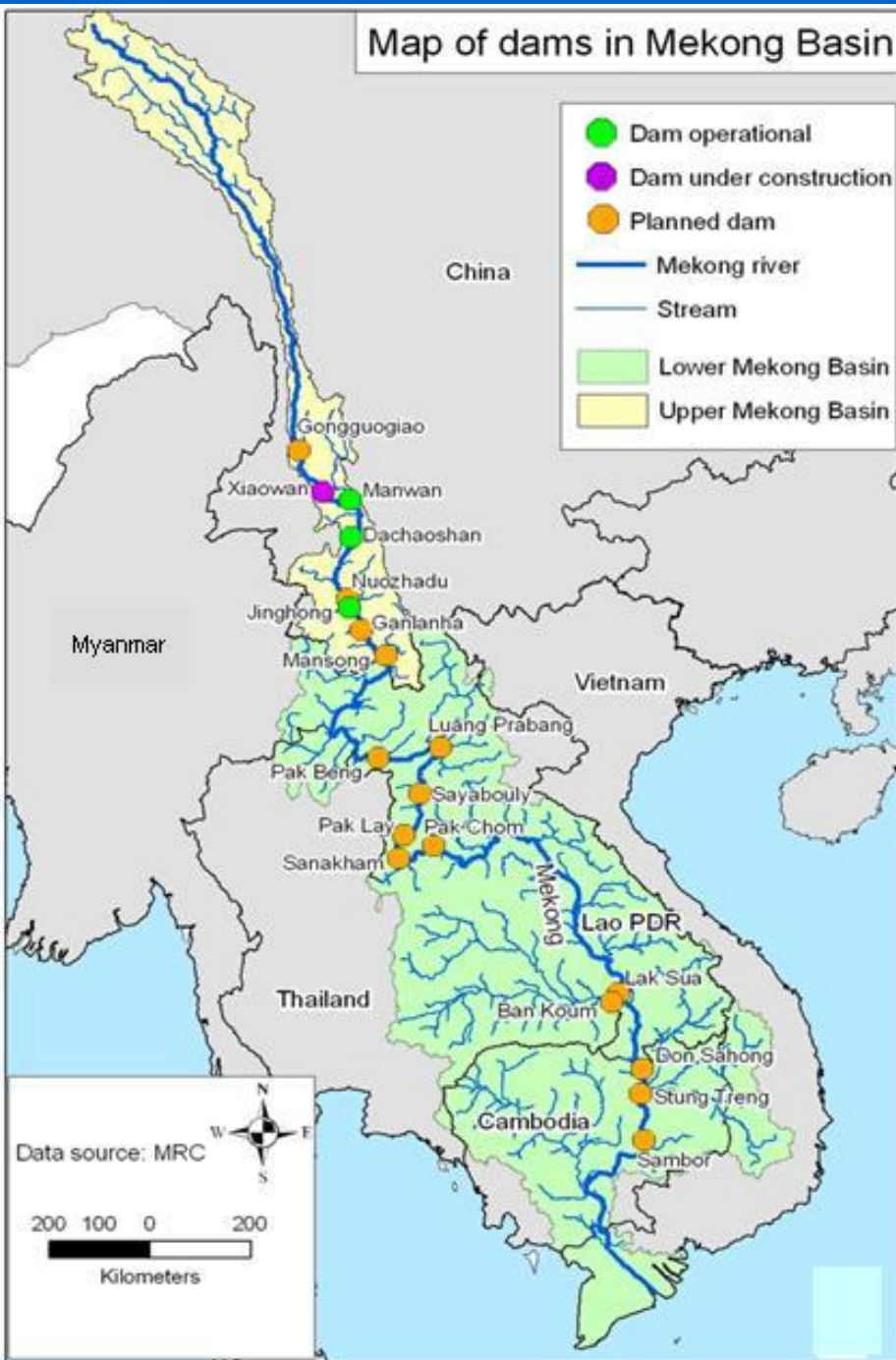


Projection: UTM Zone 48  
Spheroid: Everest 54



# Hydropower development

Map of dams in Mekong Basin



## Dams on the mainstream Mekong

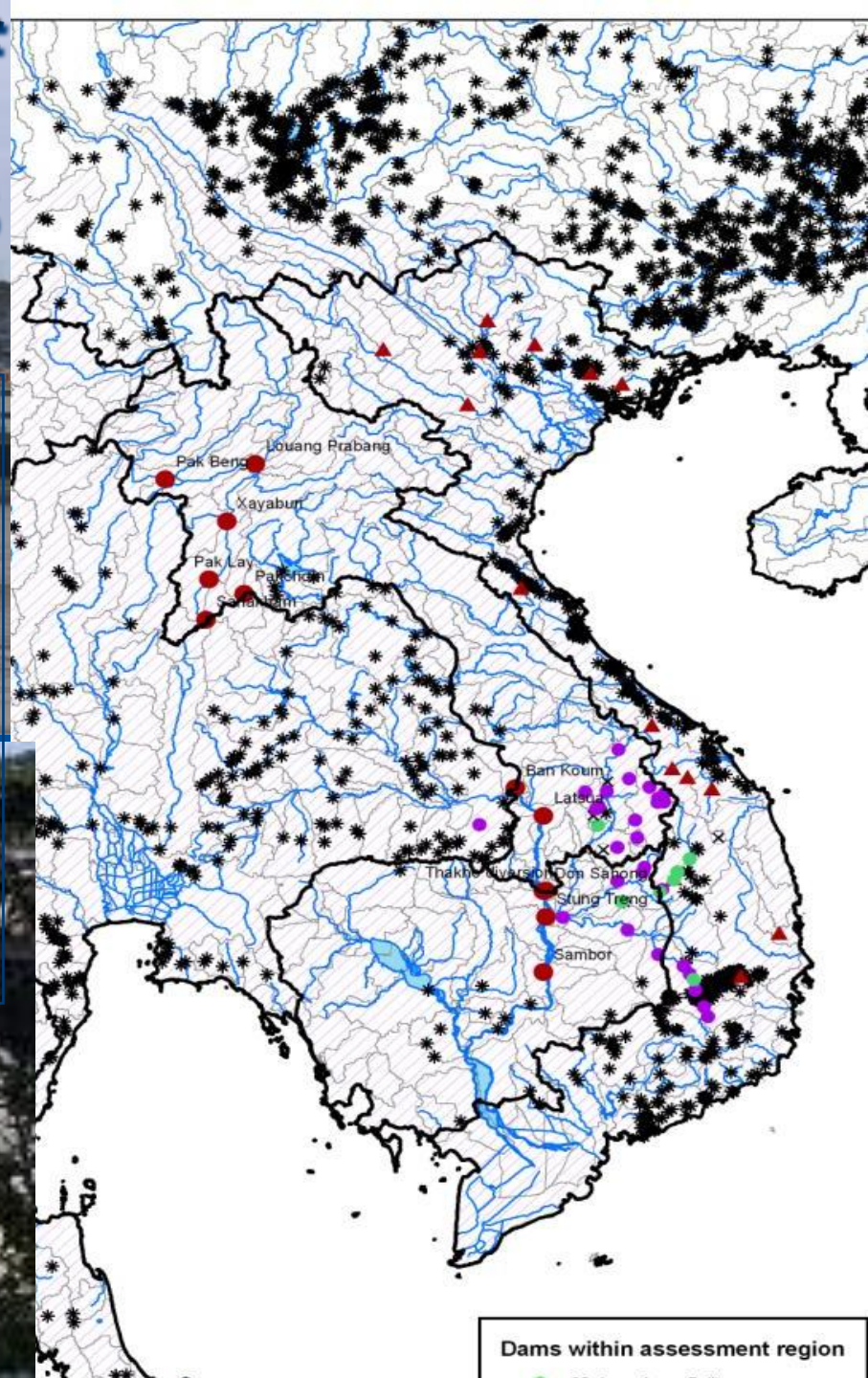
Upper Mekong – 11 existing or planned  
Lower Mekong – 12 proposed

## Dams on Mekong Tributaries

Existing and planned – 94  
(only hydro dams – does not include irrigation dams)

# Economic value of natural resources

*Existing hydropower installations comprise only about 10 per cent of the 30000 MW potential under construction or planned. The value would amount to more than 30 billion US\$ per year*





# Strategic Environmental Assessment of mainstream dams – economic analysis

Aspects assessed in economic terms:

- Hydropower development benefits
- Economic impacts on other sectors
- Poverty alleviation
- Economic fisheries loss



*Economic analysis always overlooked issues of:*  
*Ecosystem flow and services*  
*Social impact*  
*Biodiversity*  
*Climate*<sup>17</sup>

**What does the MRC do?**

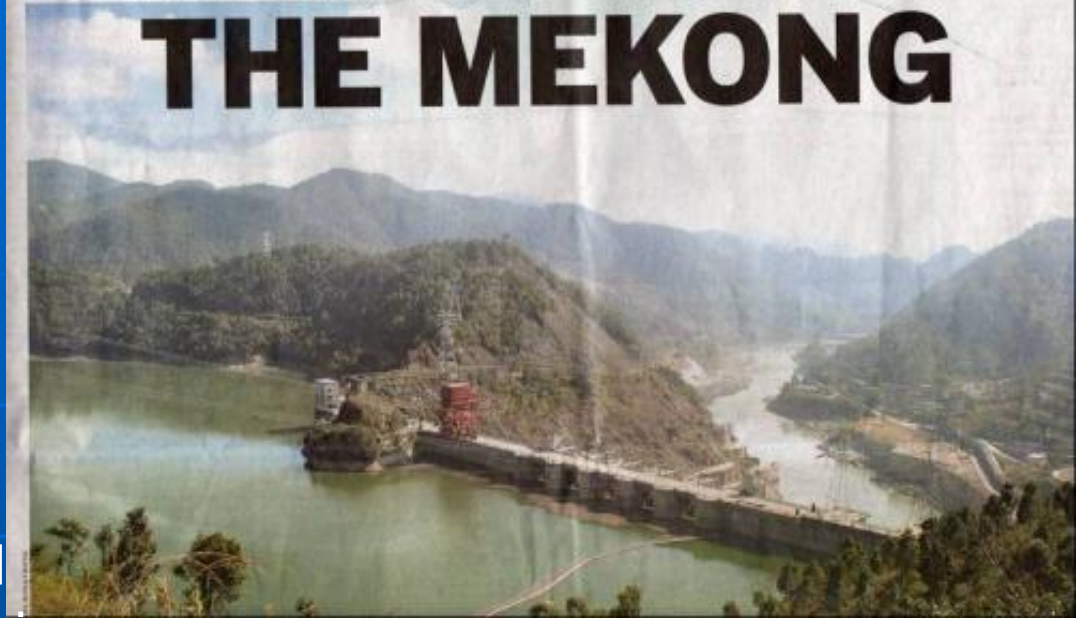
## **SUSTAINABLE HYDROPOWER**

Researches, understands and evaluates the potential costs and benefits of hydropower in the basin

Helps Member Countries adopt best environmental practices and develop sustainable hydropower solutions to their energy needs.

Facilitates the PNPCA (Procedures for Notification, Prior Consultation and Agreement)

# **MANIPULATING THE MEKONG**



# Irrigation development

An aerial photograph showing a patchwork of agricultural fields. A winding river or canal flows through the landscape, separating various plots of land. Some fields are lush green, while others are a light tan or brown color, suggesting different stages of crop growth or different types of crops. There are some palm trees scattered throughout the landscape, particularly in the lower right quadrant. The overall scene depicts a typical rural agricultural setting.

# Economic value of natural resources

*Agriculture is the single most important economic activity and sale of rice the most common income source for over half of the rural residents along the Mekong River*

# Economic value of natural resources

*Expansion of agriculture poses challenges for loss of biodiversity and forest cover and in recent years had greater impacts on forest cover than logging*

# Navigation, trade and tourism

# Economic value of natural resources

A wide, brownish river flows through a landscape with green grassy banks. Several large, multi-decked cargo boats with flat roofs are docked along the left bank. The sky is overcast with grey clouds. In the background, there are some buildings and trees on the far bank.

*The volume of trade moved by inland navigation more than doubled from 2004 to 2008 despite difficulties due to seasonal variation in water levels*

# Economic value of natural resources

A photograph showing a person in a blue cap and light-colored shirt washing the head of an elephant in a river. Two tourists, a man and a woman, are sitting on a wooden boat behind the elephant, watching the activity. The background features a riverbank with trees and a forest.

*Cruising, sailing, rafting and other water related activities are of key importance to the economic benefits of tourism*



## NAVIGATION AND TRADE

Promotes freedom of navigation in the Lower Mekong River system

Assists in co-ordination and co-operation in developing effective and safe waterborne transport

Increases international trade opportunities for the mutual benefit of the Member Countries of the MRC.



## **BASIN DEVELOPMENT PLANNING**

Using an “Integrated Water Resource Management (IWRM) approach,” the MRC facilitates a basin-wide, consultative planning process and partnerships with the basin’s stakeholders, in order to reflect community interests.



# Basin development plan – economic analysis

- Hydropower
- Irrigated agriculture
- Navigation
- Forests
- Fisheries
- Wetland area degradation
- Biodiversity loss
- Flood mitigation
- Saline intrusion
- River bank erosion

*Calculated net  
present value for  
10 scenarios and  
distributed  
between countries*

# Challenges - Environment

# Floods

An aerial photograph showing a village of stilt houses surrounded by floodwaters. The houses are built on wooden stilts, and the water is a deep blue color. The surrounding area is lush with green trees and vegetation. The sky is clear and blue.

*Although large floods can cause great devastation, normal flooding brings large benefits; estimates show benefits are about 100 times greater than costs in a normal flood year*

# Floods

A woman in a patterned sarong and a light-colored top is walking through a flooded street. She is carrying a large black umbrella over her head and two woven baskets, one on each side, suspended from a horizontal pole across her shoulders. The water is murky and reflects the surrounding environment. In the background, a man in a green shirt and dark shorts is also wading through the water. To the right, there are buildings, a motorcycle parked on a slightly elevated area, and other people. The scene is set in a tropical or subtropical environment with lush greenery.

*Flood risk management involves increasing resilience to flood-prone communities to better live with the floods and preserve beneficial effects of flooding*

# Climate change

A photograph showing a river with a thatched-roof house on stilts. In the foreground, there is a raft with people and goods. The water is turbulent, suggesting a flood or high flow. The background is a dense forest.

*The predicted changes in rainfall due to climate change indicate increased Mekong River flows in both wet and dry season, but also changes in the seasonal pattern such as longer dry season and more intense flooding in the wet season.*

# Climate change

An aerial photograph showing a vast expanse of water flooding a landscape. A central road or canal cuts through the flooded area, surrounded by green fields and trees. The water is a muddy brown color, and the overall scene depicts significant flooding.

*The Mekong Delta area would according to climate change predictions experience increased flooding from sea level rise as well as from increased flow from upstream*



## FLOOD MANAGEMENT AND MITIGATION

Works to reduce the risk faced by people living in the basin to regular flooding and helps governments become better equipped to deal with disaster.

Through the Regional Flood Management and Mitigation Centre, Phnom Penh.



# Environmental Health



- Class A - No Impact
- Class B - Slight Impact
- Class C - Impact
- Class D - Severe Impact

The map contains a marker at the location of the Water Quality Index

**Results of Mekong Env. Health and Water Quality (2010-2011)**

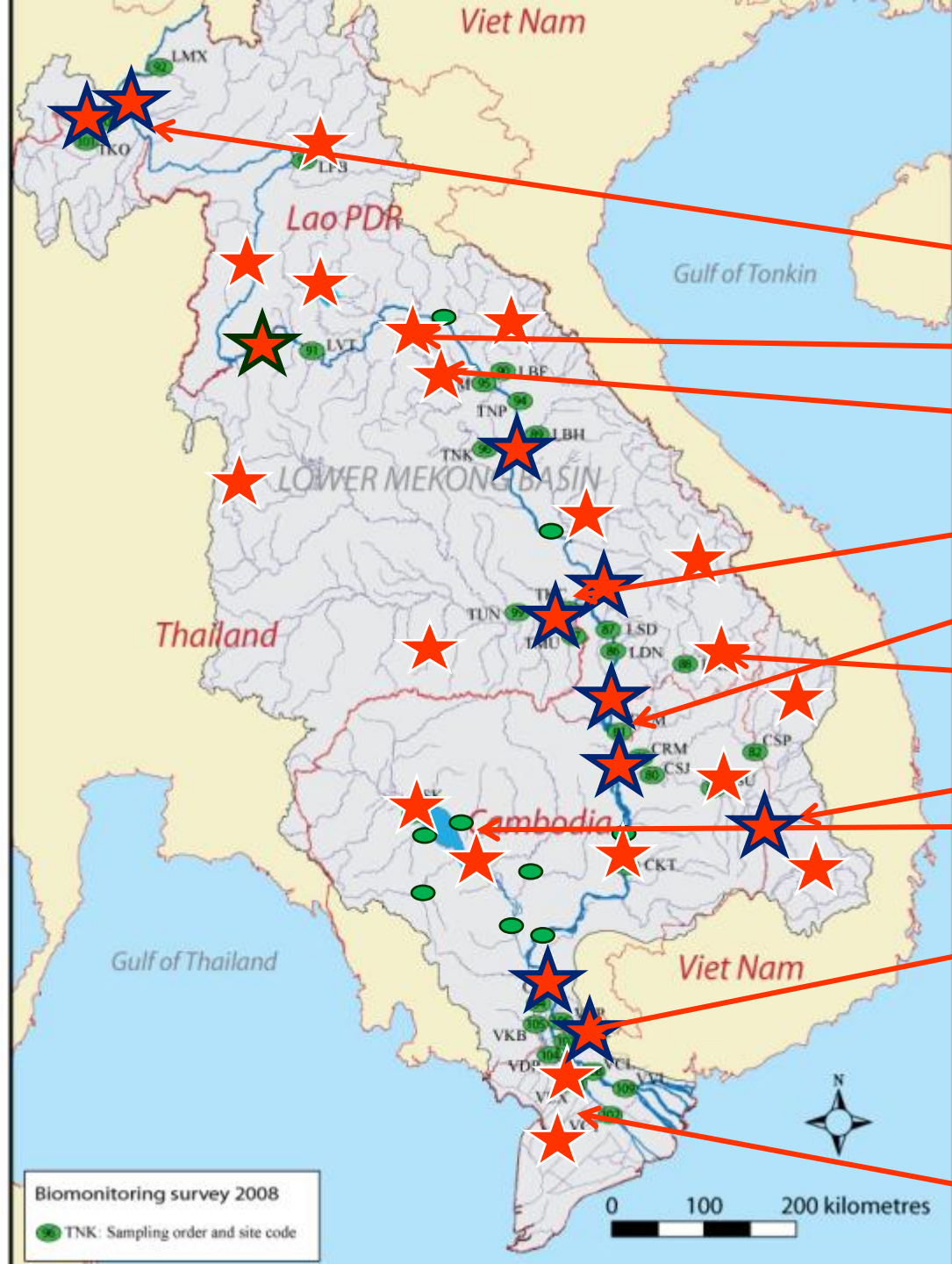
# Biodiversity



*The world scale rich biodiversity of the Mekong Basin is facing pressures of accelerating economic development, population growth and consumption*

# Biodiversity Hotspot in LMB

- Chiangsaen-Bo Kaew
- Kut ting-Bung Khong Long
- Lower Songkram basin
- Pha taem-Phu Xiangthong
- Khone Fall-Kratie
- Xe Kong, Xe Pian
- Srepok basin
- Tonle Sap/ Great Lake system
- Southern Cambodian Mekong-The Delta
- Biodiversity Hotspot/ important wetland
- Trans-boundary
- Biodiversity Hotspot
- U Minh-Tram
- Chim-Lang Sen



# Benefit from flooding to biodiversity

ບິວທອງ  
ua Thong  
ສາງທຸກຊະນິດ  
5519 994  
2567 354

*The river flood-pulse makes fish production extremely resilient to fishing pressure due to the huge production of fish fry on seasonally flooded land*



*The hydrological cycle is of key importance for sustaining biodiversity and productivity including the timing, extent and duration of flooding*

# World's highest fish production 3.9 million tonnes eq. US\$ 4-7 billion/annually



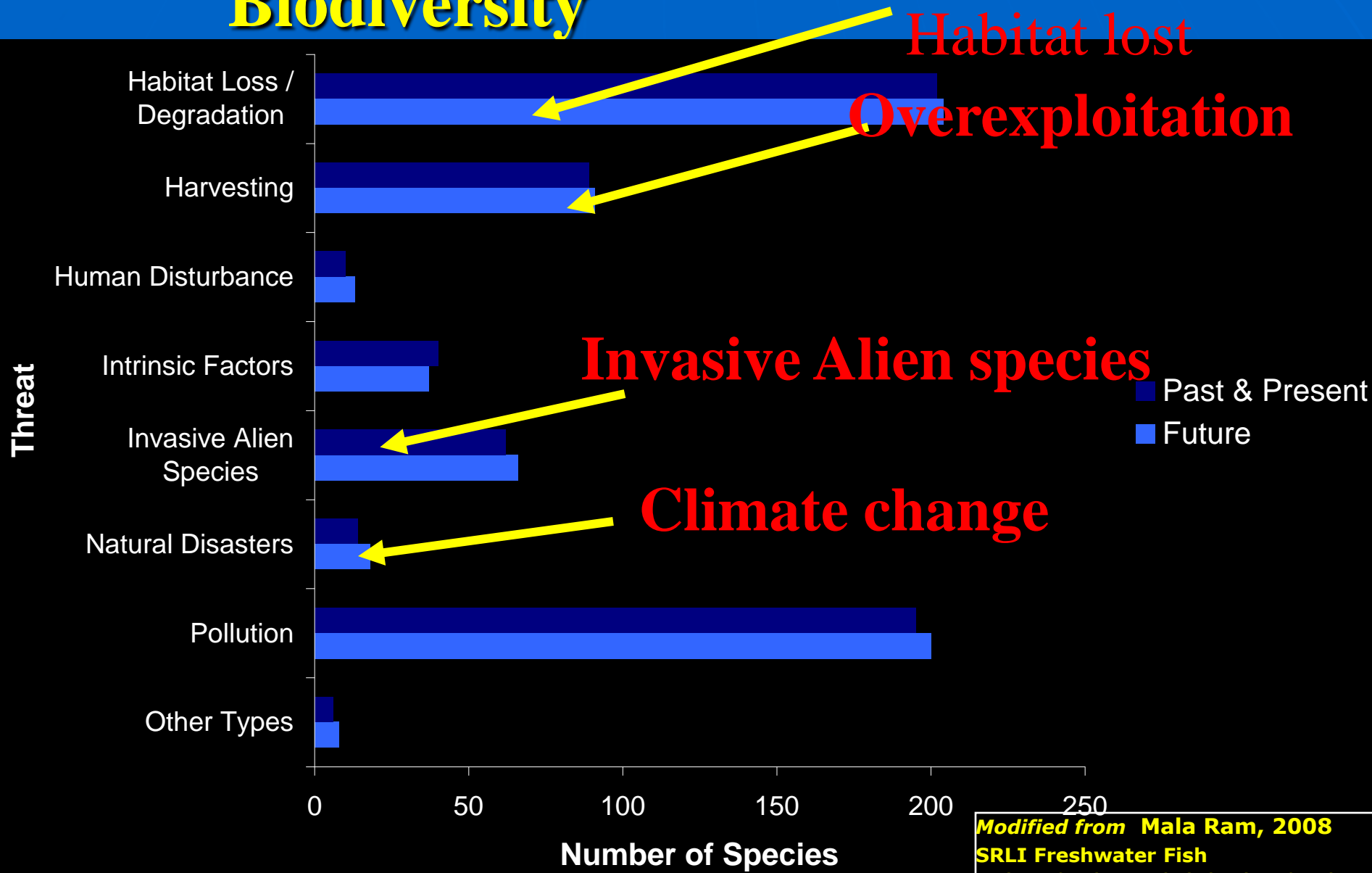
# Value of wetlands



*About 5 million US\$ annual economic benefits  
from Ecosystem services of That Luang  
Marsh, Lao PDR*



# ภาวะคุกคาม **Threats to the Mekong** **Biodiversity**



**Modified from Mala Ram, 2008**  
**SRLI Freshwater Fish**  
Institute of Zoology, Zoological Society of London

# PROTECTING AND MONITORING ENVIRONMENTAL HEALTH AND BIODIVERSITY

Working to ensure a healthy ecology  
in the basin's aquatic habitats

Developing and disseminating social and  
environmental research, e.g. Monitoring  
of water quality, Bio-indicator and  
Biodiversity Indices

Social Vs. environmental impact  
vulnerability assessments

Helping to protect endangered wetlands  
habitats and species



# Conclusion

*Current development in the Mekong Basin forming both **risk and opportunity** to livelihoods of the basin's population*

***Pro-poor development policy** is very important*

*Needs robust and sound **environmental economic principles** to support the decision making processes*

***Environmental flow and Ecosystem services** are important issues (and big challenges) to include in developmental policy at national and regional levels*

# Challenge still remains to reflect community

The First **MRC** Summit

5 April 2006, Hua Hin, Thailand



## interests





**Thank You**

