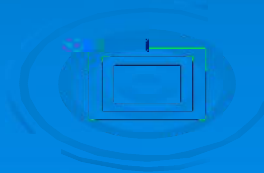


# Climate Change Impacts and Adaptation in Water Resources and Agriculture in Vietnam

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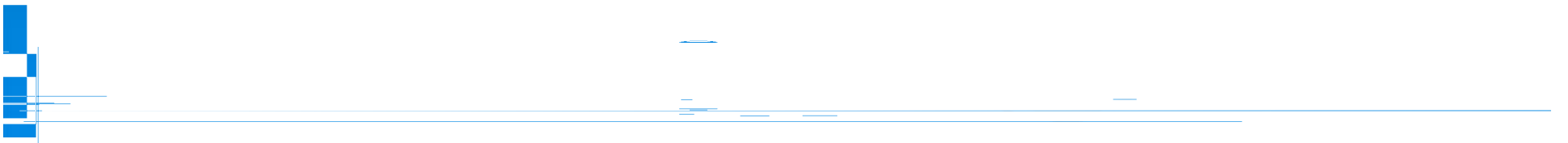




# Introduction

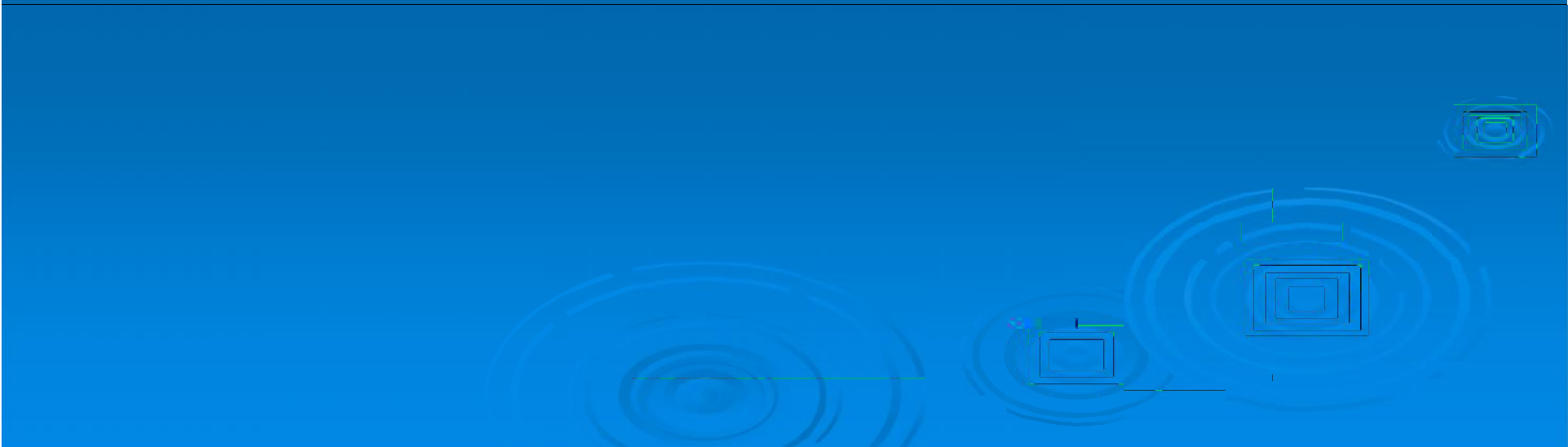
- Location:
  - Southeast Asia
  - 8°27 to 23°23N; 102°08 to 109°30E
- Area: 330,990 km<sup>2</sup>
- The coastline length: 3,260 km
- There are about 2,360 rivers and streams, average density is about 0.6 km/km<sup>2</sup>
- The two largest deltas: Mekong and Red River
- Climate: Tropical monsoon suffering from natural disasters such as typhoons, floods, drought,...





## Impacts on agriculture

- 70% of the Vietnam population rely mainly on agriculture
- Vietnam is the 2<sup>nd</sup> largest rice export country in the world
- Agricultural land is decreasing due to urbanization and sea level rise
- Based on medium emission scenario, Vietnam future climate shows:
  - The number of days with temperatures below 20° C will be reduced
  - The number of days with temperatures above 25°C will be increased: the North from 124 days (2000) to 176 days (2050) and 207 days (2100)



## *The impact on the growth, development and spread of pests*

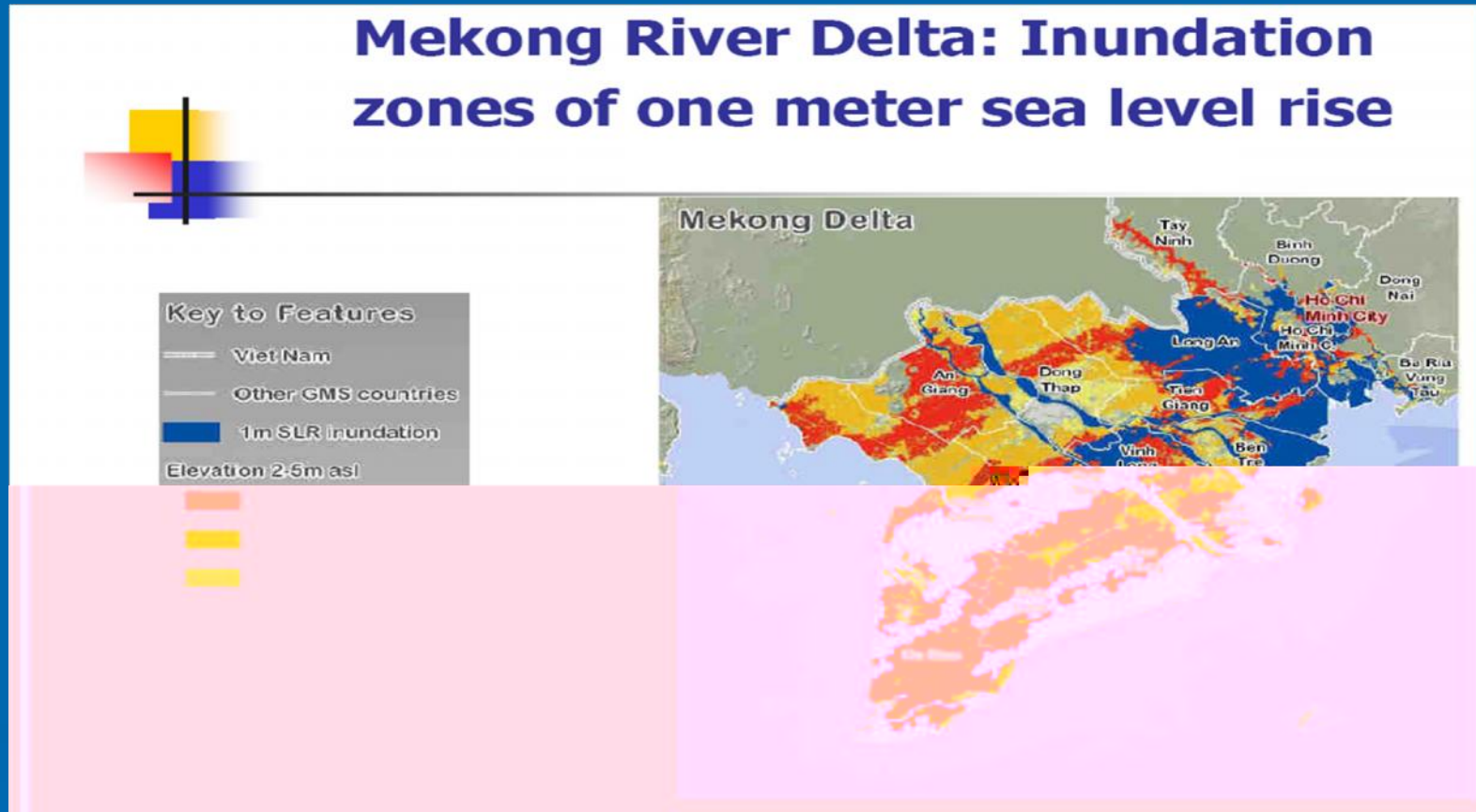
- *Growth, development and spread of pests may increase in conditions of high temperature and rainfall fluctuations*

## *Impacts on seasonal planting*

- The northern spring rice can be planted 5 to 20 days earlier.
- Rice harvest season can be earlier than the current by 20 to 25 days.
- The yield of spring rice may decrease: In 2050, yields of Northern spring rice can be reduced by 12.5%, in 2070 may be reduced by 16.5%

# Impacts on agriculture land due to sea level rise

## Mekong River Delta: Inundation zones of one meter sea level rise



If sea level rise 1 m: 39% area of Mekong Delta, over 10% area of Red River Delta, 2,5% of coastal area of the Central, will be inundated.

As sea level rises → loss of agricultural land; millions of farmers living in the lowlands have to migrate



# Adaptation in Agriculture

## NATIONAL CLIMATE CHANGE STRATEGY



- Maintain sustainable land for agricultural cultivation;
- Research and implement effective agriculture and husbandry schemes;
- Research, develop and apply biotechnology, advanced manufacturing process towards a modern agricultural system;
- Develop and improve the system of control and disease prevention;
- Develop mechanisms and policies, strengthen the system of insurance, risk sharing for agriculture

# Specific Actions for Adaptation in Agriculture

-Increasing irrigation water use efficiency

-Developing appropriate farming techniques: Change in planning and harvesting times, soil fertility maintenance, fertilizer use and application, erosion control....

-Increasing quantity and quality of processed animal feedings as well as selecting high productive breeds

-Use of different variety/species

-Development/improvement of national forest fire management plans

-Development of species resistant to drought, salt, flood, disease & pest.

-Development of weather early warning system

-Re-structure the agriculture production plan and cropping patterns

-Protecting natural forest and enhancing reforestation / afforestation

-Increasing the efficiency with forest raw materials are converted to forest products

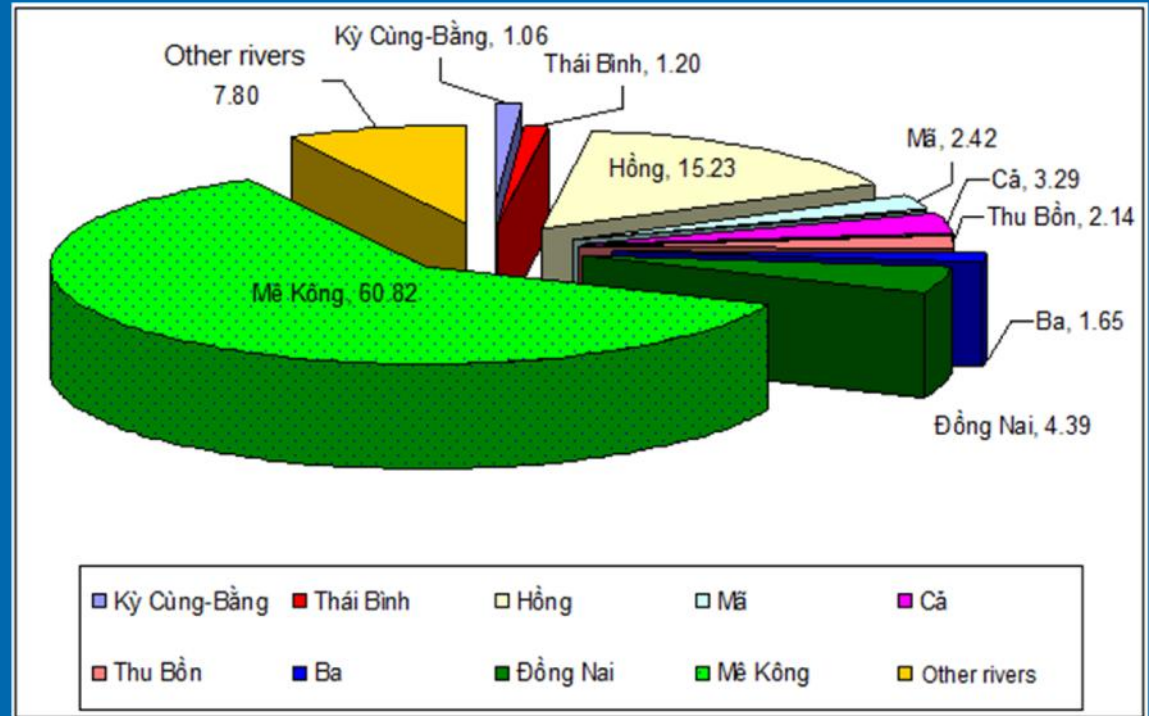
-Protecting and developing mangrove forests and natural forests.

- Diversification and intensification of food and plantation crops

# Impacts on Water resources

## Vietnam River Water Resources

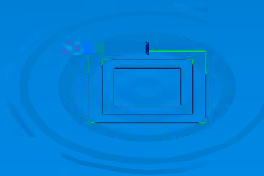
➤ Mainly from Mekong and Red River Deltas

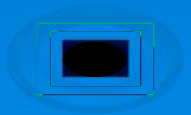


- Annual flow at Mekong River at Tan Chau for 2010-2050 increases about 4% for B2 and 7.6% for the A2 scenarios compared to the period 1985 – 2000.
- In flood season: at Tan Chau increases 2% and 6% under scenario B2 and A2, respectively
- In dry season: at Tan Chau decreases under both scenario B2 and A2

## Impacts on Flooding

- With the impacts of climate change, flood flows and flood peak tend to increase
- For Mekong River Delta in annual flood season, the Mekong River flood inundates nearly 2 million hectares, lasting 3-5 months.
- In years with severer floods, significant human and property losses occur.
- However, flooding also brings alluvial soils to fertilize the land, abundant aqua-products and positive effects in sanitary for rice fields.
- Increase in flooding in upstream together with sea level rise will limit the drainage on Mekong River system and lead to more serious inundation.





# Adaptation in Water resources

## NATIONAL CLIMATE CHANGE STRATEGY

- Complete Integrated Water Resources Management for effective exploitation, protection and use of water resources;
- Implement capacity building for water resource management.
- Raise community awareness on climate change
- International cooperation



## Specific activities for adaptation in water resources

**-Building reservoirs,  
upgrading existing dykes  
-Effective use of water  
resources.**

**-Enhancing residual soil  
moisture through land  
conservation techniques**

**-Reforestation/afforestation to  
increase natural water storage  
-Conducting studies in long-term  
water resources prediction**

**-Improving system of water  
management  
-Enhancement of flood controls  
and drought monitoring**



