

CLIMATE CHANGE and FOOD SECURITY IN VIETNAM

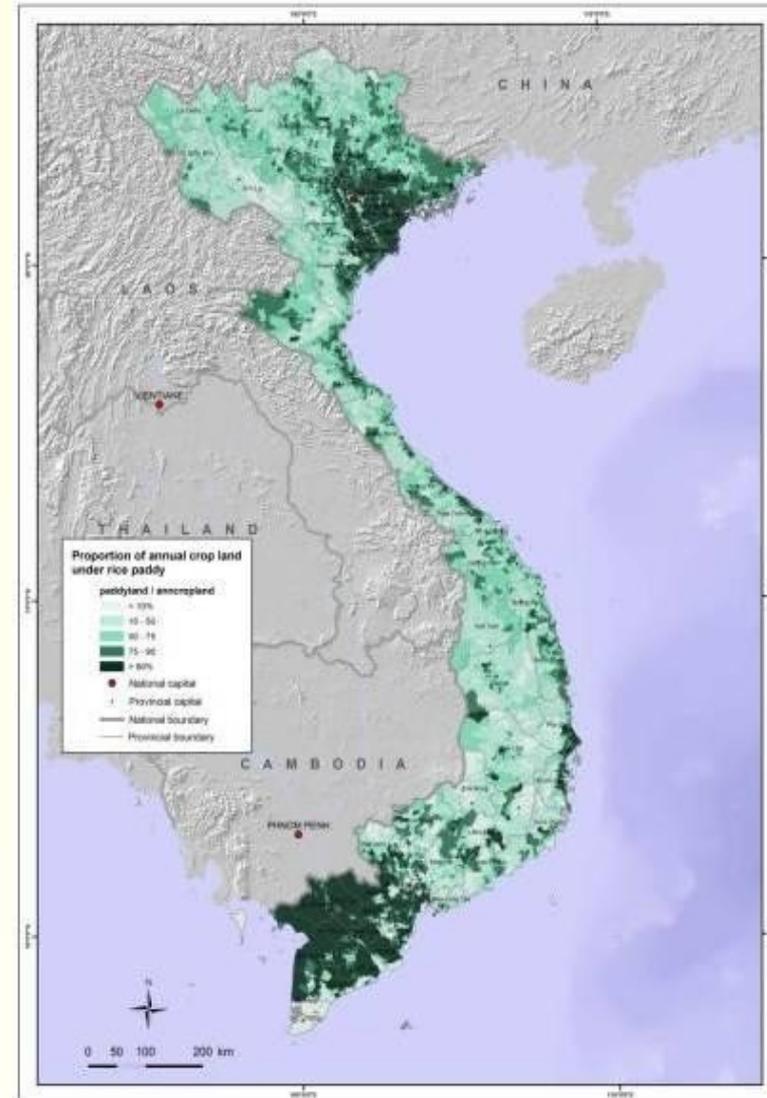
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Vietnam: rapid economic transition

- Area: 310700 km²
- Pop (2009): 87 millions
- Pop rural : 70%
- GDP: 220\$ (1994)
1068 \$ (2009)
- GDP growth rate 90-2010:
5,8%/year
- Exportation: rice, coffee,
pepper, cashew, fish, rubber ...



Climate change = Adaptation + Mitigation

Adaptation is initiatives and solutions to reduce the damage of nature and human in order to prevent the effects of climate change

Mitigation is technology changes or additions to decrease the quantity of emission per unit of product or total emission

A. ADAPTATION TO CLIMATE CHANGE

The environment threatened by climate change :

The Greenhouse effect, sea-level rise, temperature changes, natural disasters caused serious consequences for agricultural production:

The agricultural land area is shrinking more and more due to natural disasters. (erosion, runoff, landslides, earthquakes, tsunamis, floods, droughts, desert, salinity infected and sandstorms)

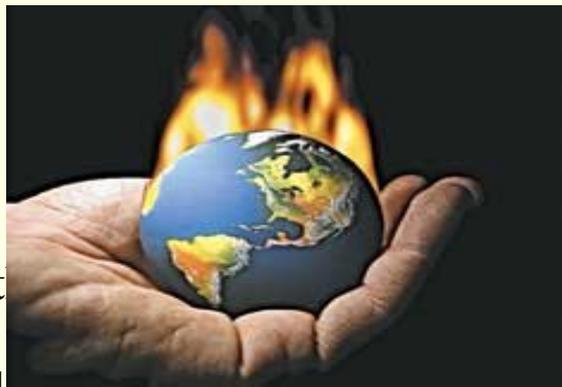
Natural and agricultural ecosystems are not only degraded, but also destroyed or altered for the worse (productivity decline, poor quality, genetically modified ...)

Communities' social-economic life is severely affected: Loss of habitat, increase in poverty, unemployment, disease and social evils adversely affect resources for production.



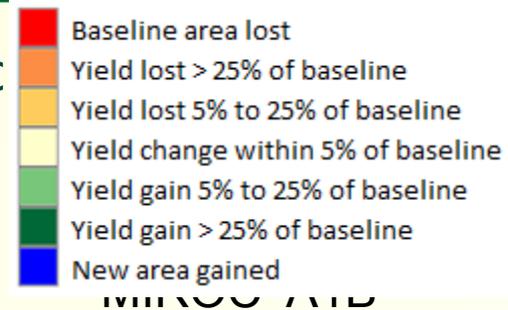
Warnings and forecasts of agricultural land-use affected by climate change

An increase in the Greenhouse effect, as global warming, causes a danger to land and human life.



- with over 3,000 km of coastline, Vietnam has a high vulnerability of soil. The average temperature has increased by 0.5°C and sea level had risen 20 cm compared with 50 years ago. If temperatures rise above 2°C, there would be about 22 million people lost the land due to flooding. According to latest forecasts for 2050-2070, about 50-70% of land in the Red River Delta and in particularly in the Mekong Delta will be submerged in water to 1m and will to be lost.
- If the Earth's temperature rise above 3-5°C, the land will be arid, drought that will threaten about 50 million global population falling into poverty due to lack of water for agriculture and life. In 10 years, Vietnam's temperature has increased from 0.1 to 0.2°C. In addition, the long dry season has made a significant increase in soil drought and risk of desertification.

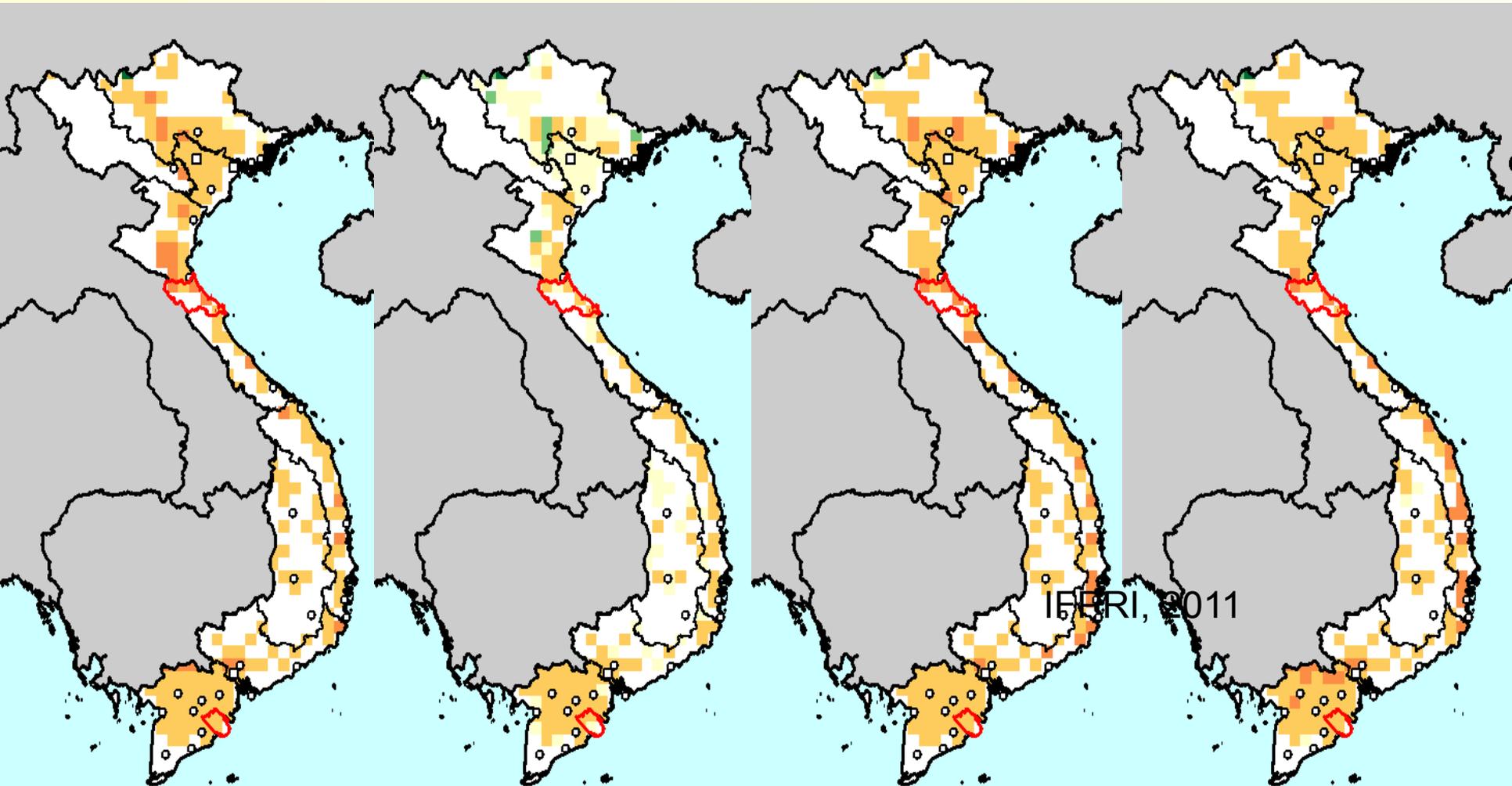
Significant impact on yield of irrigated rice



CNRM A1B

CSIRO A1B

ECHAM A1B



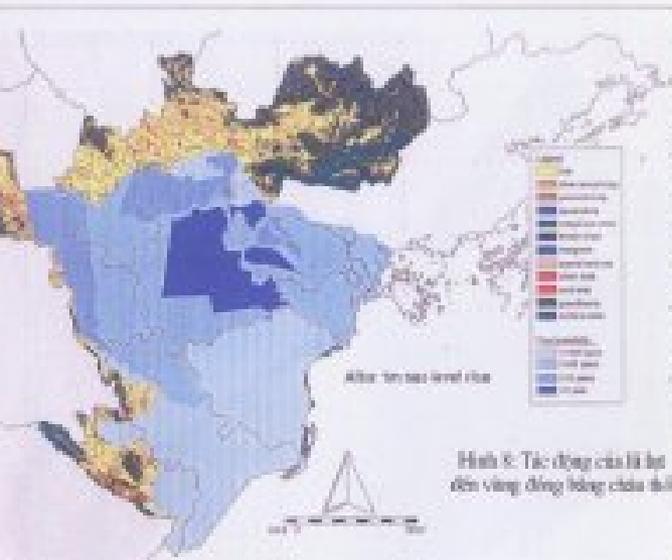
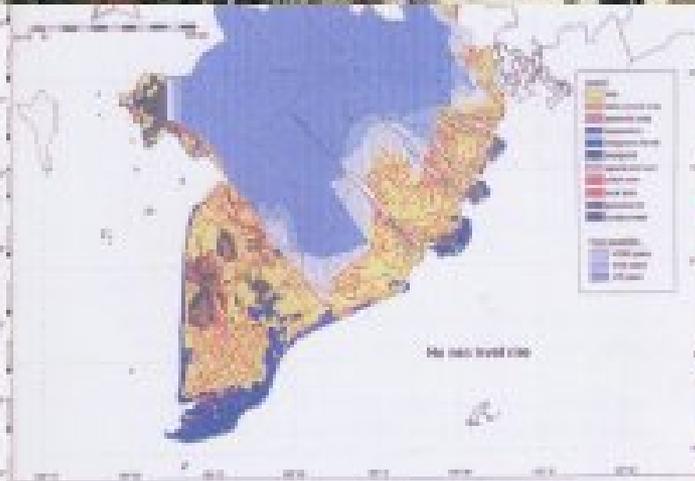
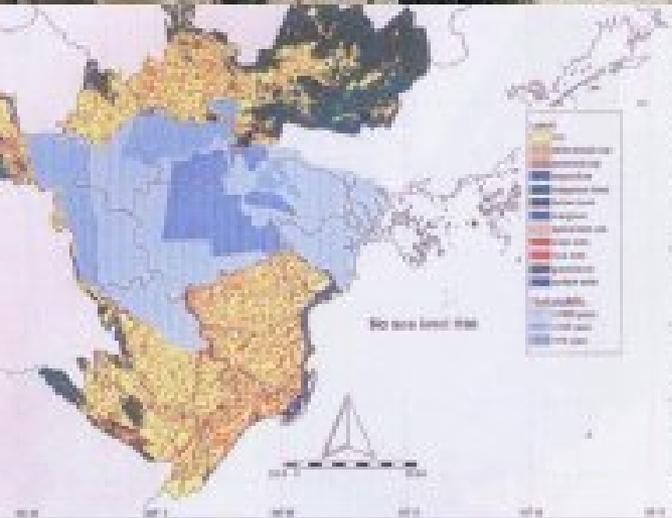
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Second level

● Third level

● Fourth level

● Fifth level



Hình 10: Tác động của biến đổi khí hậu đến vùng đồng bằng châu thổ sông Mê Kông

Nước biển dâng 1m: Vùng bị ngập ở đồng bằng sông Cửu Long

Current status of agricultural land degradation due to climate change

Soil erosion and runoff

- Soil erosion associated with slope, slope distribution, separation of topographic slope, bare soil or different vegetation/crops and strong, concentrated flow of water in the tropical rainy season. Soil erosion is increasing in some sloping areas due to climate change causing heavy and continuous rains during the rainy season. As the result, these phenomena lead many serious consequences: a landslide with strong flow, on a high slope without plant cover.
- Soil leaching phenomenon occurs not only on erosion- sloping land but also on all kinds of land in our country, including the plain and in case of a great flood, water flooding, its soil will be waterlogged.



Soil salinization

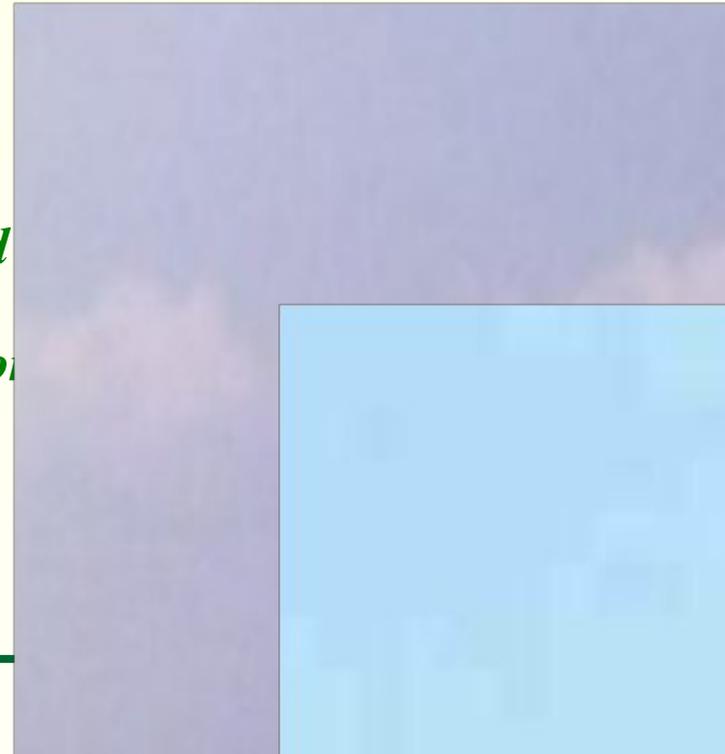
- Land degenerated due to:
 - The climate change in coastal areas, tsunamis, storm surges and sea level rise
 - Areas producing salt, salt-contaminated soil
 - Areas of artificial shrimp raising: after raise shrimp, is unable to immediately grow rice and vegetables due to salt wa

Desertification/ arid soil

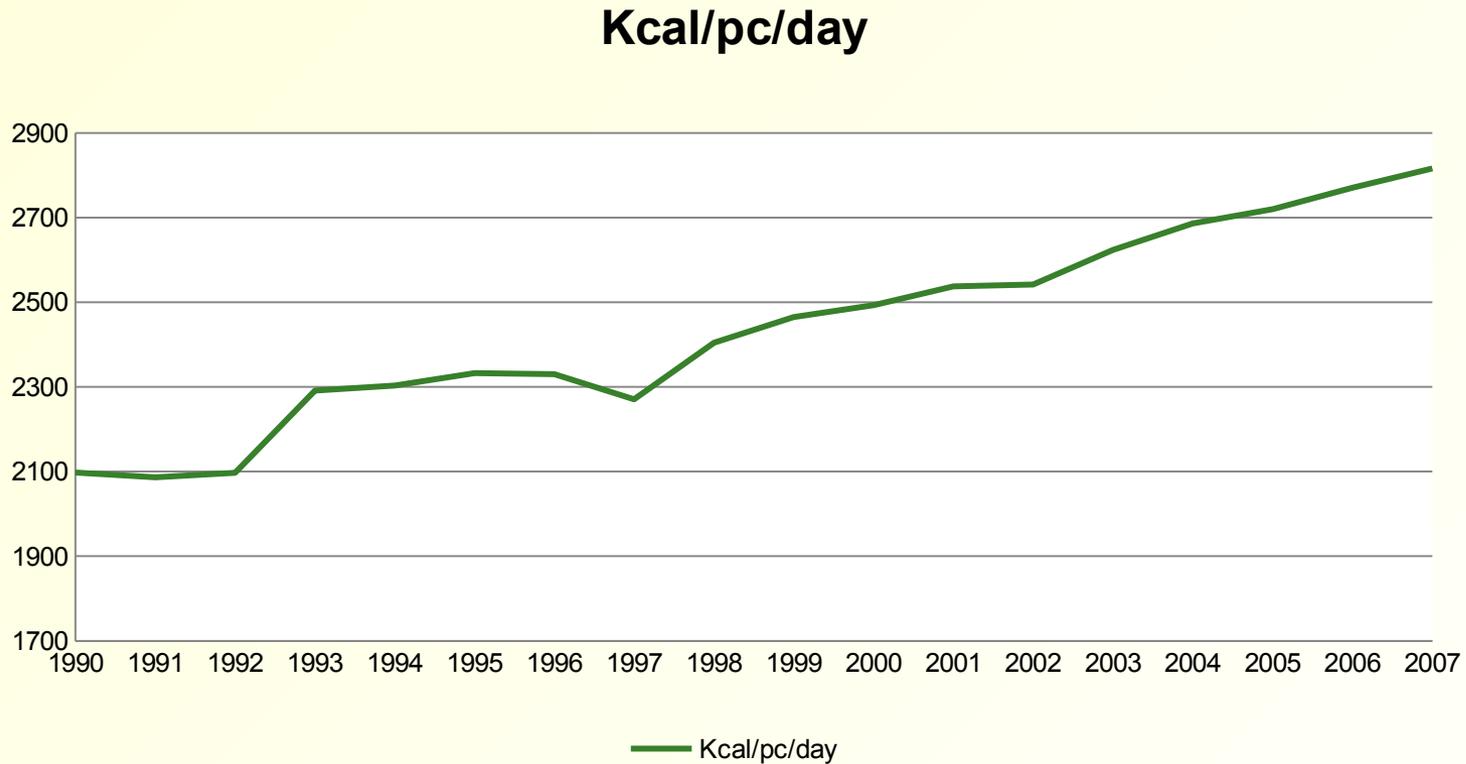
➤ In many midland hills or coastal zone, climate change cause prolonged drought, forests destroyed and burned to milpa cultivation, land hardened, carpet crops destroyed, desertification of soil.

- The consequences of desertification and prolonged drought are very serious:

- + *Lose agricultural production area due to arid and poor nutritious soil.*
- + *Be able to grow only drought-resistant crops, sho*



National Food Security





Food security, Who are more Vulnerable?

Still 1 million of persons (8,7 %) at different regions in the food insecurity

- Poor ethnic minority groups in remote area
 - Communities facing frequent natural disasters in coastal
 - The poor landless and land-lost in deltas
 - The poor urban migrants
-



New challenges for rice and of food security

Best rice land converted rapidly into industry and urban

Climate change – risk for rice: sea level increase, drought, flood, temperature

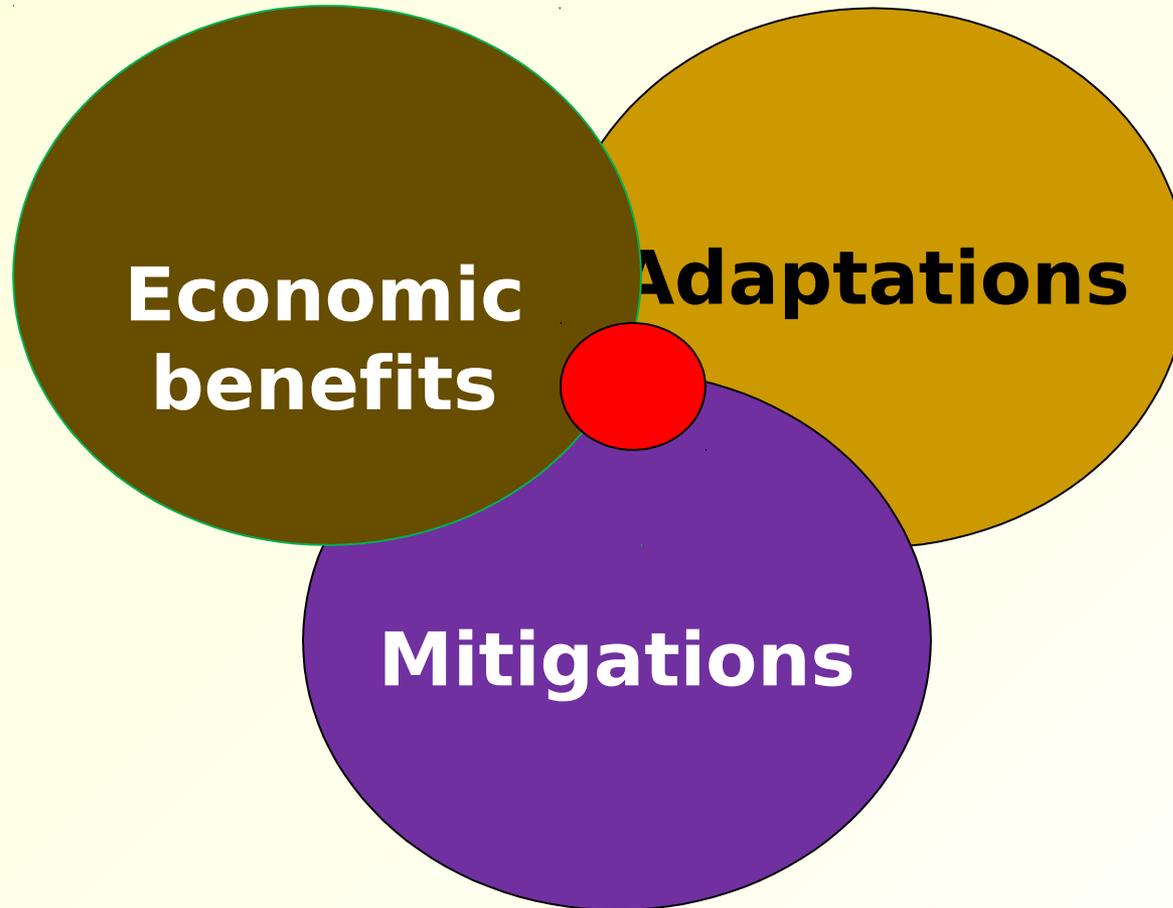
Green revolution Rice technology reached the limit

Price of labor and material input highly increase,

Low incentive for farmers

Food insecurity still exist at different regions

Strategy to combine 3 benefits for climate change solution



Adaptation Measure: Construction

- Design and construct fields against erosion and runoff (terraced rice cultivation, Secondary crop along the contour, industrial crops in mountainous areas, field dam in the delta area)



and submersion in the riverside and coastal zone



Adaptation Measure: Plants and Crops

Protect watersheds which contribute to reduce flow causing erosion and flash floods, keep and adjust water from the river, reduce greenhouse gas emissions.

Protect and grow the forest belts, mangrove forest to stop salty wind, sandstorms and to prevent soil salinity in the coastal zone.



- Perform rotation, intercrop in the delta to maintain and increase soil fertility, to keep moist soil and to increase agricultural output.



Agroforestry models *increase the level of cover, soil moisture and anti-erosion ability.*

Model	Gradient (o)	Coverage (%)	Soil moisture (%)	Quantity of Soil erosion ton/ha/year
Natural forests	8 - 15	80	16,9	85,2
Native Eucalyptus forest	8 - 10	45	15,3	158,8
	8 - 10	90	17,6	75,0
Agroforestry model	8 - 10	-	9,5	189,4



Adaptation Measure: Grow grass; develop buffalo, cow; protect soil

- Hill, mountain areas have an advantage of large natural area, with many forests, hills, natural grass for grazing or for growing high yield grass varieties
- Poor and not poor households are able to raise cattle because its foods are different with human's foods
- Traction of cattle is important in agricultural production and transport of goods
- Development of livestock products is the main income of households.



Adaptation Measure: Organic biologic agriculture

➤ Cover land with vegetation or agricultural waste towards perennial plants or root vegetable seeds (against runoff land, evaporation, drought and weeds, protection and increase of organic matter for land). Compost organic fertilizer (cattle manure, green manure and especially biologic/microbiologic manure from waste, agricultural waste which are kept with microorganic preparations)..

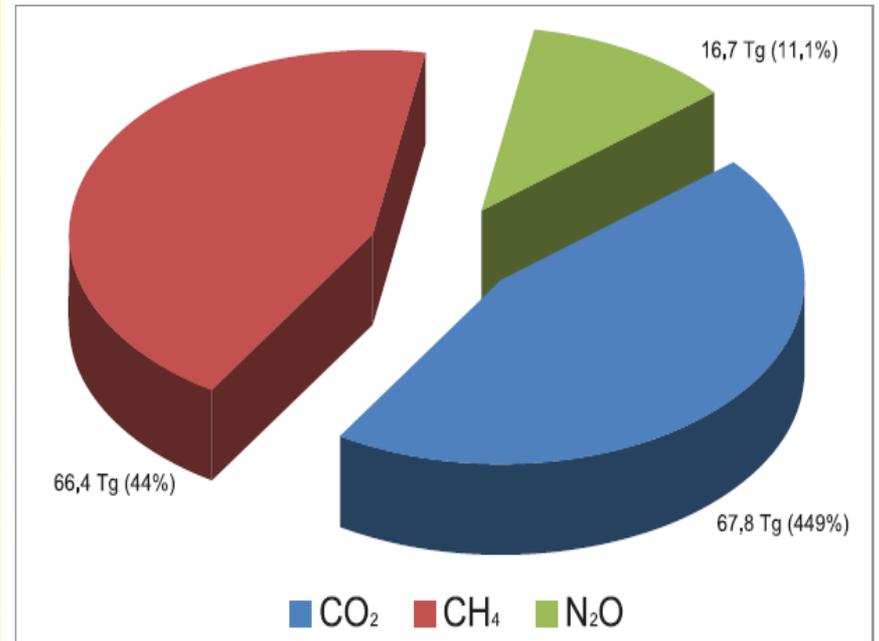
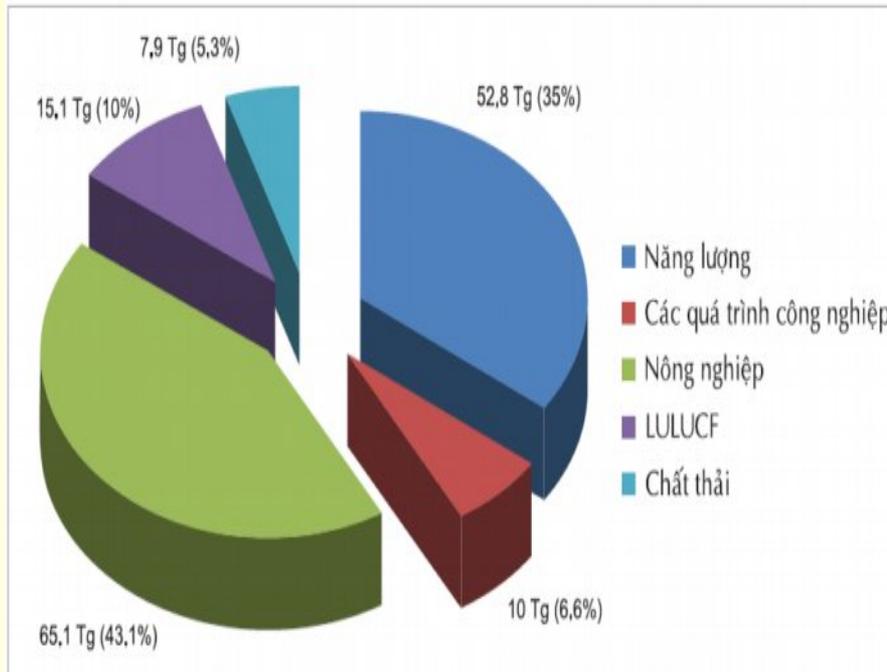




B. OBJECTIVES OF MITIGATION GHGs

- *1. Building and completing the technical process of rice production to reduce green house gas emission (GHGs)*
 - *2. Reducing the cost, increasing the productivity, saving and reducing fossil energy usage.*
 - *3. Establishing and organize the voluntary farmer organization participating in implementation of the technical process to reduce green house gas emission.*
 - *4. Proposing the policies to promote the small – scale farmer households to participate in agricultural cultivation to reduce green house gas emission. Contributing on sustainable agricultural development and poverty reduction*
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National GHG inventory 2000



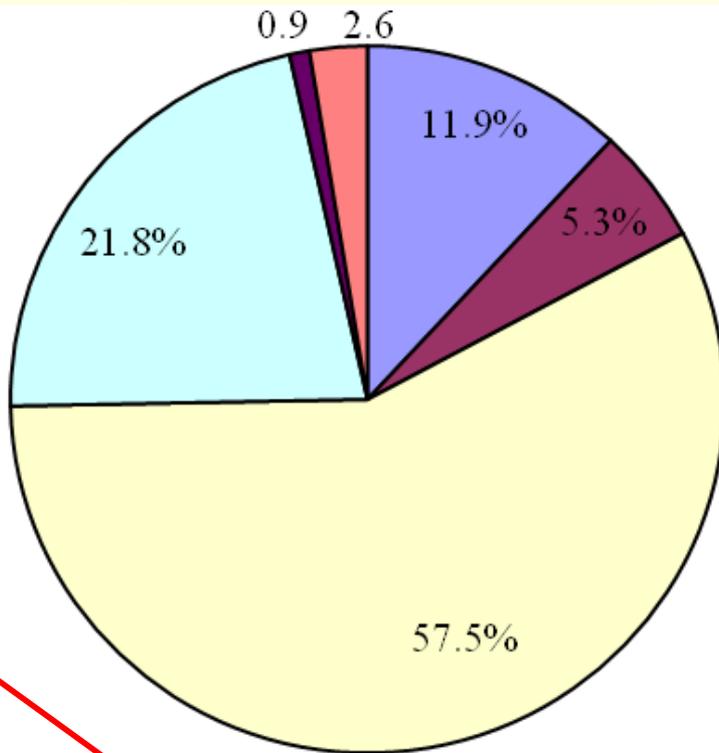
- Total: 150,8 mill tons CO₂eq
- Agriculture: 43%;
- Energy: 35%
- LULUCF 10%

- CO₂: 45%
- CH₄: 44%
- N₂O: 11%

Source: MONRE 2010

Proportion of GHGs emission (CO equivalent) in Vietnam agriculture

Rice cultivation



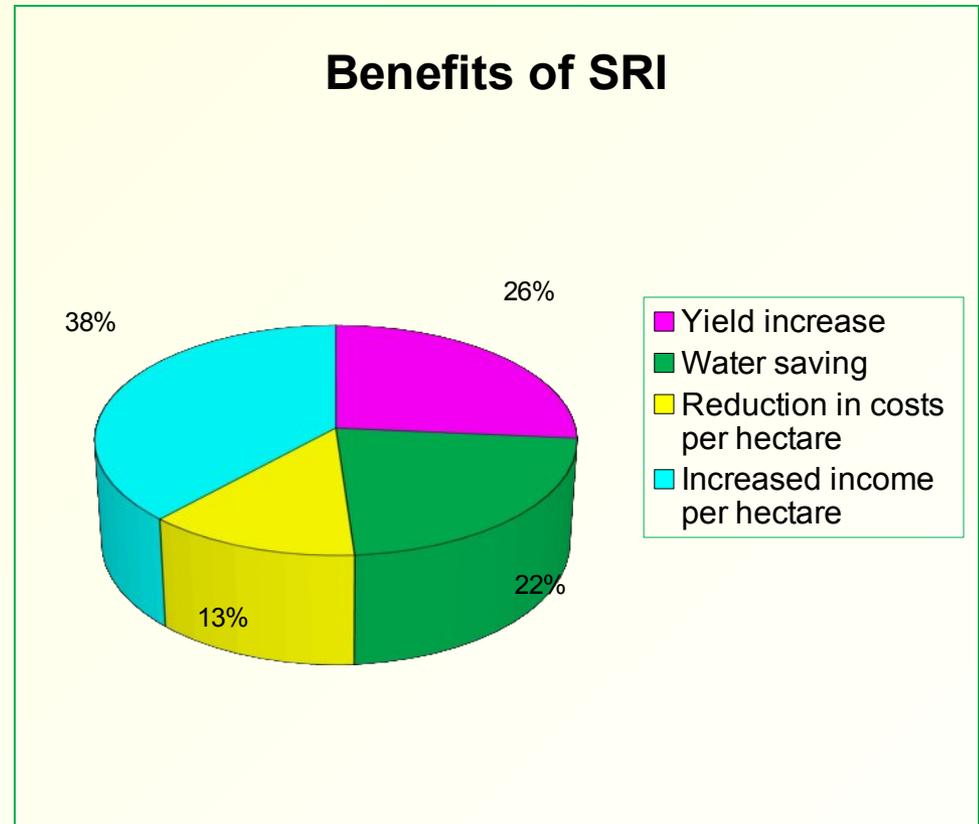
- Enteric Fermentation
- Manure management
- Rice cultivation
- Agricultural soil
- Prescribed burning of savannas
- Field burning of agricultural residues

Sources: (MONRE, 2010)



Relevance of SRI for climate change

- Beyond increasing yields, SRI offers three major benefits that have significant climate implications if applied on a large-scale.
- Reduced demand for water
- Reduced methane gas emissions
- Reduced use of nitrogen fertilizers



Source : Average of on-farm evaluations of impacts from SRI methods in eight countries

The techniques used to make rice cultivation to reduce emissions of greenhouse gases (GHGs) – in An Binh - Hai Duong



1. Sowing rice seeds on the ground, transplanting young rice seed with 2- 3 leaves:



2. Thin cultivation - saving rice seed, increase the capacity of photosynthesis



3. weeding, scouring mud – control insect by IPM Method



4. Water management - Alternate wetting and drying irrigated, reducing the emission of Mêtan – CH₄, saving water

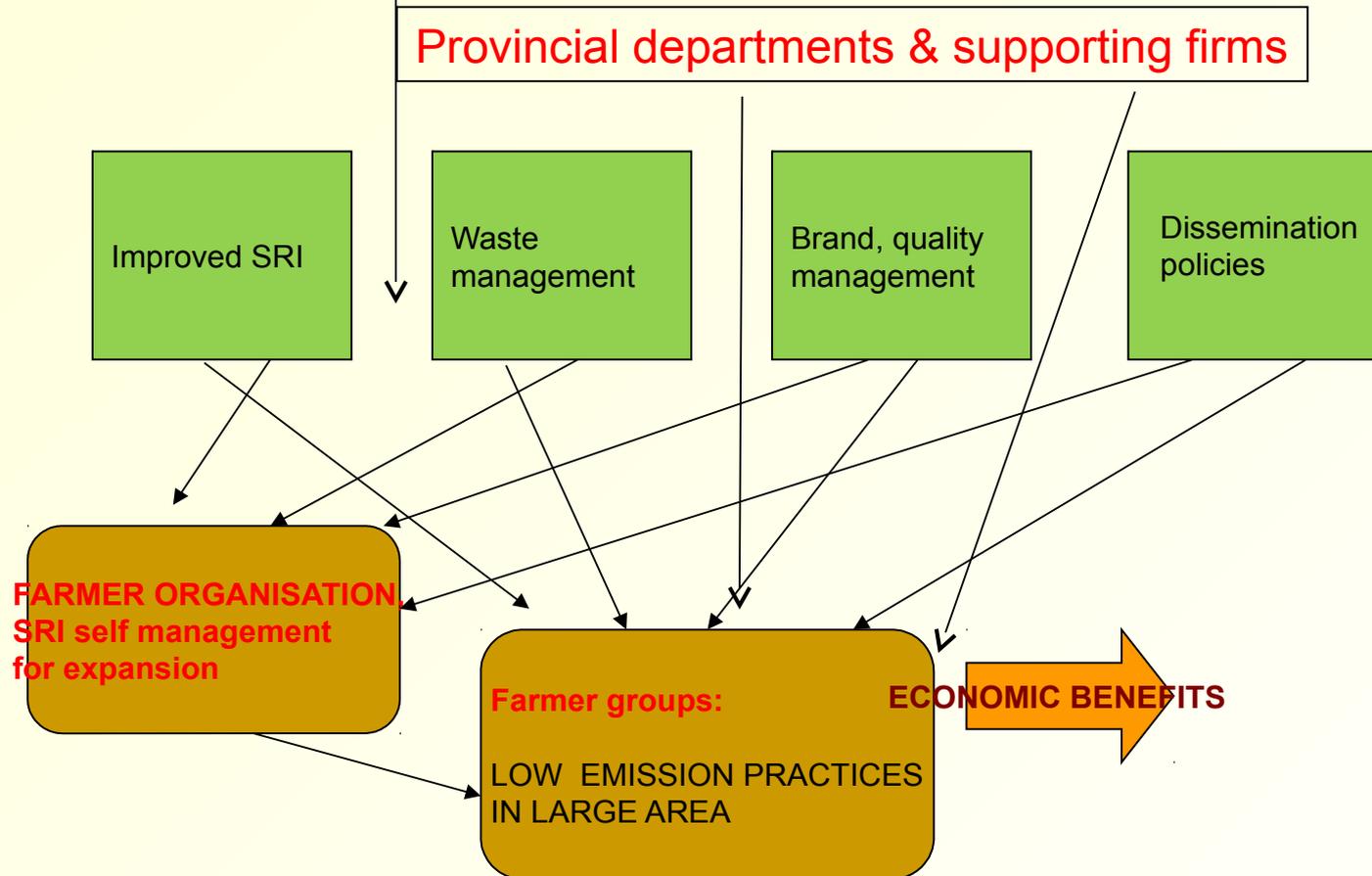


5. Reducing CO₂ and N₂O emission - Reducing straw burning by producing Biochar coal and composting bio-organic fertilizer





Set up FIELD for low emission rice cultivation based on SRI





Policy for food security under climate change

After the World food crisis 2008,

Objectives

adequate food supply sources higher than the population growth rate

to put an end to food shortage and hunger (by 2012)

to ensure that rice producers earn profits average more than 30% over production costs

Reduction 20% of GHG emission

The policy for Food security

- Protecting 3,8 millions ha of rice-field
- More public investment with a top down approach
- Revising land Law: land-use right longer for 50 years, ensuring land security for small farmers.
- Canceling the maximum land size by household for land
- Regional policies differentiation for rice:
 - Effort concentration for core rice production area in Mekong for growth export to contribute to World food security
 - Diversification policies for other areas: local food security and rural development at regional level
 - Attraction private investment in the agricultural value chain for food safety
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Conclusions

- Food security objective is challenged under climate change
- Need the policy to attract local community to invest in the adpatation and mitigation
- Raising awareness at community level by exprerience exchange