CONTENT

1. GENERAL INFORMATION OF THE MD
2. FUNCTIONS OF MD IN FOOD SECURITY
3. IMPACTS OF CLIMATE CHANGES ON MD‘S FOOD SECURITY
4. ADAPTATION ‘ STRATEGIES?
The Delta is considered as a large wetland with rich biodiversity for food security and fishery production for VN.
Agricultural production

- 40% of National Agro-sector GDP
- 50% total paddy outputs
- 90% rice outputs for export
- 60% total fishery outputs
- 75% total fishery export value
- 50% meat and eggs production supplying to other regions
- High Q fruits: >70% national production ......
Playing as food security for the country

- National rice area
- Red RD rice’ area
- Rice area of MKD
- National rice production
- Red RD rice production
- Rice production of MKD
### Rice production orientation in Vietnam to 2020 and 2030

<table>
<thead>
<tr>
<th>Year</th>
<th>Rice land areas (mil. ha)</th>
<th>Rice cultivation area (million ha)</th>
<th>Yield (tons/ha)</th>
<th>Production (million tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>4.1</td>
<td>7.2</td>
<td>4.98</td>
<td>35.8</td>
</tr>
<tr>
<td>2010</td>
<td>4.0</td>
<td>7.2</td>
<td>5.17</td>
<td>38.0</td>
</tr>
<tr>
<td>2015</td>
<td>3.8</td>
<td>7.0</td>
<td>5.51</td>
<td>39.7</td>
</tr>
<tr>
<td>2020</td>
<td>3.7</td>
<td>6.9</td>
<td>5.71</td>
<td>41.0</td>
</tr>
<tr>
<td>2030</td>
<td>3.5 (MD=1.8)</td>
<td>6.8</td>
<td>5.82</td>
<td>45.0 MD=30</td>
</tr>
</tbody>
</table>
SHARING FOOD’S SECURITY TO THE WORLD (IRRI, 2009)

World total rice export 2007-08: 29.687 MMT
World total rice export 2008-09: 29.520 MMT
Still SHARING FOOD SECURITY TO THE WORLD?
- Total milled rice consumption to 2020) & MD rice supply by 6 million tones?

000 MT


59 mmt
1.4 million ha of 1 rice crop
0.5 million of double crops
High bio-diversification

0.7: 1 crop
1M= 2 crops
0.2 M = 3 crops
0.2 M= shrimp
& mangrove-deforestation

1. Rice =1,85 millions ha
2. Fruits trees=0.22 milions ha
3. Industrial crops= 0,22 M ha
4. Aquaculture= 0,63 M ha

Problems of water’s pollution & lower bio-diversification
INTENSIVE RICE CULTIVATION CREATED GLOBAL WARMING

• Land uses
  – Lost mangrove forests > CO₂ increases
  – Extensive rice growing > CH₄ increases
  – Livestock raising > CH₄ increases

• Rice technology
  – Fertilizers application > N₂O increases
  – Emission of CO₂ and other gases

• >> need quantitative data.
SHOCKS: flood in wet season, salinity instruction in the dry season, & impact of climate changes

Rainfall: 1600mm (May to December)

Water Flows
- Wet Season: 40,000m³/s
- Dry Season: 1,800m³/s

Flooding in wet season
Salinity instruction in dry season

when SLR 70 cm
- Salinity -- as early as February – 20 %o salinity line advances inward 60-80 km of the inland. Rice yield reduced.
- Drought in February – reduces yield of rice in dry season
SEASONAL VULNERABILITY (Source: NA Tuan 2009)


- **Hot and Dry**
- **Drought**
- **Dry spell**
- **High flood**

- **Water shortage**
- **Acid water**
- **Early flood**
- **Erosion**

- **Salinity intrusion**
- **Lightning**
- **Heavy rain + High tide**
- **Storm**

- **Southeast wind**
- **Cold**
Farmers with low income and low education

<table>
<thead>
<tr>
<th>Sub Zones</th>
<th>Average Gross income/capita/year (million)</th>
<th>Average expenditure/Capita/year (million VND)</th>
<th>Rate of Saving HH (%)</th>
<th>Illiterate (%)</th>
<th>Primary school (%)</th>
<th>Secondary school (%)</th>
<th>High school (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh water area</td>
<td>8.2</td>
<td>6.2</td>
<td>68</td>
<td>2</td>
<td>26</td>
<td>39</td>
<td>32</td>
</tr>
<tr>
<td>Salinity &amp; acid soils</td>
<td>6.4</td>
<td>5.0</td>
<td>47</td>
<td>20</td>
<td>55</td>
<td>21</td>
<td>4</td>
</tr>
</tbody>
</table>

Unsustainable agricultural production because of its increased exporting, but low farmer’s income.
Rice farmers with landless and small land

- Landless: 14%
- Farm size <0.2 ha: 25%
- 0.2<=farm size <0.5: 3%
- 0.5<= farm size <1.0: 9%
- 1<= farm size <3: 24%
- 3<=farm size <5: 24%
- Farm size =5: 1%
Mekong Delta flooded areas at three scenarios

(MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT 18-08-2009)

Sea level 75 cm
Additional area at sea level 100 cm

Mekong Delta sea level rise:

+65cm, flooded 5.133 km² (12.8%);
+75cm, flooded 7.580 km² (19%);
+100cm, flooded 15.116 km² (37.8%).
REDUCTION OF RICE:
- Triple rice cropping will be reduced by 1.8% during mid-2030s,
- Double rice cropping will be reduced by 2.7%

INCREASE OF INSECT'S DAMAGE BY CHANGE ON

BP
Hopper = 1.17 time

+ 2.26
+ 0.58
### Impacts of weather variability on rice production (Source: Nhan & et al-2010)

<table>
<thead>
<tr>
<th>Weather variability by crop</th>
<th>Farmers’ estimation</th>
<th>Statistical estimation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Return period (years)</td>
<td>Yield losses (tons paddy)</td>
</tr>
<tr>
<td>Dry season crop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low temperature in Jan</td>
<td>3 - 4</td>
<td>0.6</td>
</tr>
<tr>
<td>Rainfall in Feb</td>
<td>3 - 4</td>
<td>0.6</td>
</tr>
<tr>
<td>Wet season crop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extremely hot temperature in May (irrigated region)</td>
<td>3 - 4</td>
<td>0.3</td>
</tr>
<tr>
<td>Heavy rainfall in Jun</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>(irrigated region)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Droughts in May</td>
<td>5 - 6</td>
<td>1.8</td>
</tr>
<tr>
<td>(coastal region)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Adaptation strategies?

• Reduce rice production?
• NO! We may have better approaches toward impacts of CC by:
  – Adaptation
  – Mitigation
  – Policy ‘ dialogues for food’s security at the different levels of: household, region, nation and international level
Adaptation: Livelihood ‘ Approaches

Vulnerability Context

Livelihood Assets

Policies, Institutions & Process

Livelihood Outcomes

- Agro-ecological approaches
- Agricultural diversification
- Community capacity building
- Adaptation to climate changes

Livelihood Strategy

- Increase of income
- Reduction of vulnerabilities
- Improvement of food security

Shocks Trends Seasonality

N H P F
Conclusion: Food security, livelihoods, and rural development

Regional level: Rural sustainable Resource mgt

Local level: Livelihoods’s improvement & Community development

Adaptation by improving rice-farmer ‘livelihoods.’
Mitigation by adjusting farmer practices with lower Agro-Chemical inputs

➡ Sustainable food security at:
  1. Household level
  2. National level
  3. Globalization
Thank you for listening