Sustainable Rice Production in the Mekong River Delta (MRD) Under Climate Change

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LEARNING OBJECTIVES

1. The need to focus on applying complementary climate-smart agriculture (CSA) portfolios in coping with climate change challenges

2. The link of early warning and forecast systems with CSA options is very important

3. Integration of CSA portfolios at the landscape level is an important consideration
Funding for the Climate Change affecting Land Use in the Mekong Delta: Adaptation of Rice-based Cropping Systems (CLUES) was provided by the Australian Centre for International Agricultural Research (ACIAR).
CLIMATE RESILIENT RICE FOR MRD: MULTIPLE CHALLENGES

Salinity Intrusion

2004 (a normal weather year)

Flood/Submerge Zones

Acidic Sulfate Soils

Drought, brown plant hopper, bacterial leaf blight (serious problem), rice blast (serious problem)

Results of CLUES project

2004 (a normal weather year)
CLIMATE-RELATED PROBLEMS IN MRD

<table>
<thead>
<tr>
<th>DRY SEASON</th>
<th>RAINY SEASON</th>
<th>DRY</th>
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<tbody>
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<td>Jan.</td>
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<td>Feb.</td>
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<tr>
<td>Mar.</td>
<td>Heat + drought</td>
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<tr>
<td>Apr.</td>
<td>Drought</td>
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<td>Jun.</td>
<td>Dry</td>
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<td>Jul.</td>
<td>Flood + lodging</td>
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<td>Aug.</td>
<td>Flood + lodging</td>
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<td>Nov.</td>
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<td>Dec.</td>
<td>Storm</td>
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Results of CLUES project
Submergence Tolerance

Salt Tolerance

IR49830 (Sub1)  IR64
Samba  IR64-Sub1
Samba-Sub1
IR64-Sub1
Samba  Samba-Sub1
IR64

Ismail et al. 2013
Field Crops Res

Results of CLUES project

Australian Government
Australian Centre for International Agricultural Research
FUTURE CLIMATE-RESILIENT CROPS

Grain Quality + Submergence Tolerance + Salinity Tolerance + Anaerobic Germination + Others

Salinity Screening

Anaerobic Germination
WATER SAVING TECHNIQUES IN RICE

Benefits of AWD
• 30% water savings
• Better crop performance (root development, “stronger” plants, less lodging, fewer diseases)
• Lower GHG emission

Results of CLUES project
Cucumber at Vi Dong 25 days after sowing.

Cost comparison, return and profit of two cropping systems in 2013 (Million VND/ha)

Value (Million VND/ha)

- Total Cost
- Gross Return
- Net Profit

Results of CLUES project

- Triple rice cropping
- Rice-2Cucumber Rice
“Although official warnings of expected salinity and drought problems during the Dong Xuan season generally reach farmers early, these warnings did not translate into adjusted agricultural production on a large scale.

Warnings have been ignored, either because the expected severity wasn’t communicated strongly enough or because of a lack of alternatives greater than the production subsidy given to farmers.”

2004 (a normal weather year)

CLUES Project
LINKING EARLY WARNING WITH ACTION

CLUES Project
+ Local Knowledge
+ Topo map
+ Hydro map
+ Infra map

Normal Year

Severe Year

- High Risk
- Medium Risk
- Low Risk
- Not Affected
CLIMATE-RESILIENT CROPS TO FARMS TO VILLAGES/LANDSCAPE

<table>
<thead>
<tr>
<th>Early Warning System</th>
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<tbody>
<tr>
<td>Carbon Smart</td>
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<td>Site-specific nutrient management</td>
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<td>Alternate wetting and drying (AWD)</td>
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</tbody>
</table>
CLIMATE-SMART VILLAGES (CSVs)
TAKE AWAY MESSAGES

• Several technological options and approaches for CSA have been identified for the MRD, but concerted programs are needed for large-scale adoption by farmers and, where appropriate, linked with actions in response to early warnings and forecasts.

• CSA options will need to be integrated into future policy shifts (e.g., from quantity to quality targets for rice production) to enhance sustainability of rice production in the MRD.

• Adaptation to climate change cannot be seen in isolation from development inside the delta and in the wider Mekong Basin, namely infrastructure development.