

CLIMATE-SMART
Agriculture
2015



Global Science Conference

March 16-18, 2015

Le Corum, Montpellier France

Integrated rice-shrimp as a smart strategy to cope with climate change in the Mekong Delta, Vietnam

Trinh Q. Tu¹, Tran V. Nhung², Phan T. Lam³

¹Research Institute for Aquaculture No.1, Vietnam

²WorldFish, Penang, Malaysia

³Research Institute for Aquaculture No.2, Vietnam

Montpellier

March 16-18, 2015

Outline

1. Introduction

2. Methodology

3. Results

4. Conclusions & recommendations

Introduction

- The MD extents 4.0mil.ha, is the country's "rice bowl & fish basket"
- Rice & aqua. constitute a major part of diet and livelihoods and for export.
 - Rice : > 54 %
 - Aqua: > 72 % } of the country's total
(GSO 2011)
+ Shrimp: 94 %

Introduction

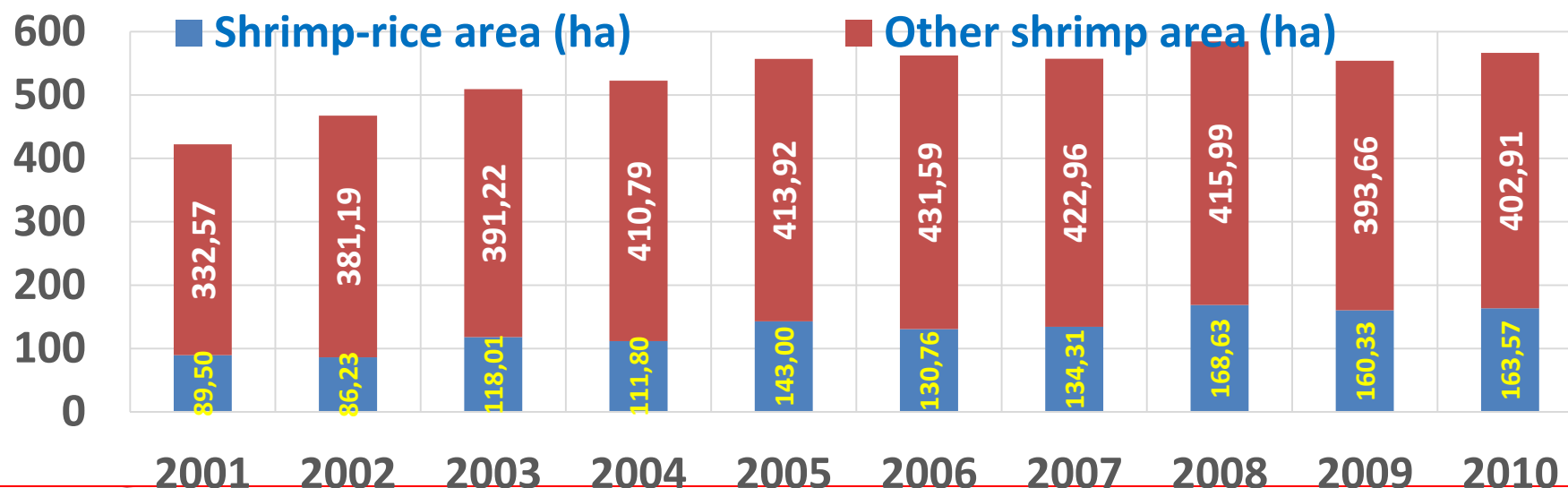
- Among three most vulnerable deltas to impacts of CC & SLR (UNDP 2011; Francisco 2011)
 - 1m SLR: flooding 39% of area; affecting 35% of the pop.

The need for more sustainable approach:

- Increases productivity & resilience
- Reduces GHGs emission
- Enhances national food security & dev. goals

Introduction

- Integrated agri-aqua are widespread in the MD
- SR started in 1960s, increased substantially since the 1980s.
 - Shrimp culture in dry season
 - Rice cultivation in wet season



Introduction

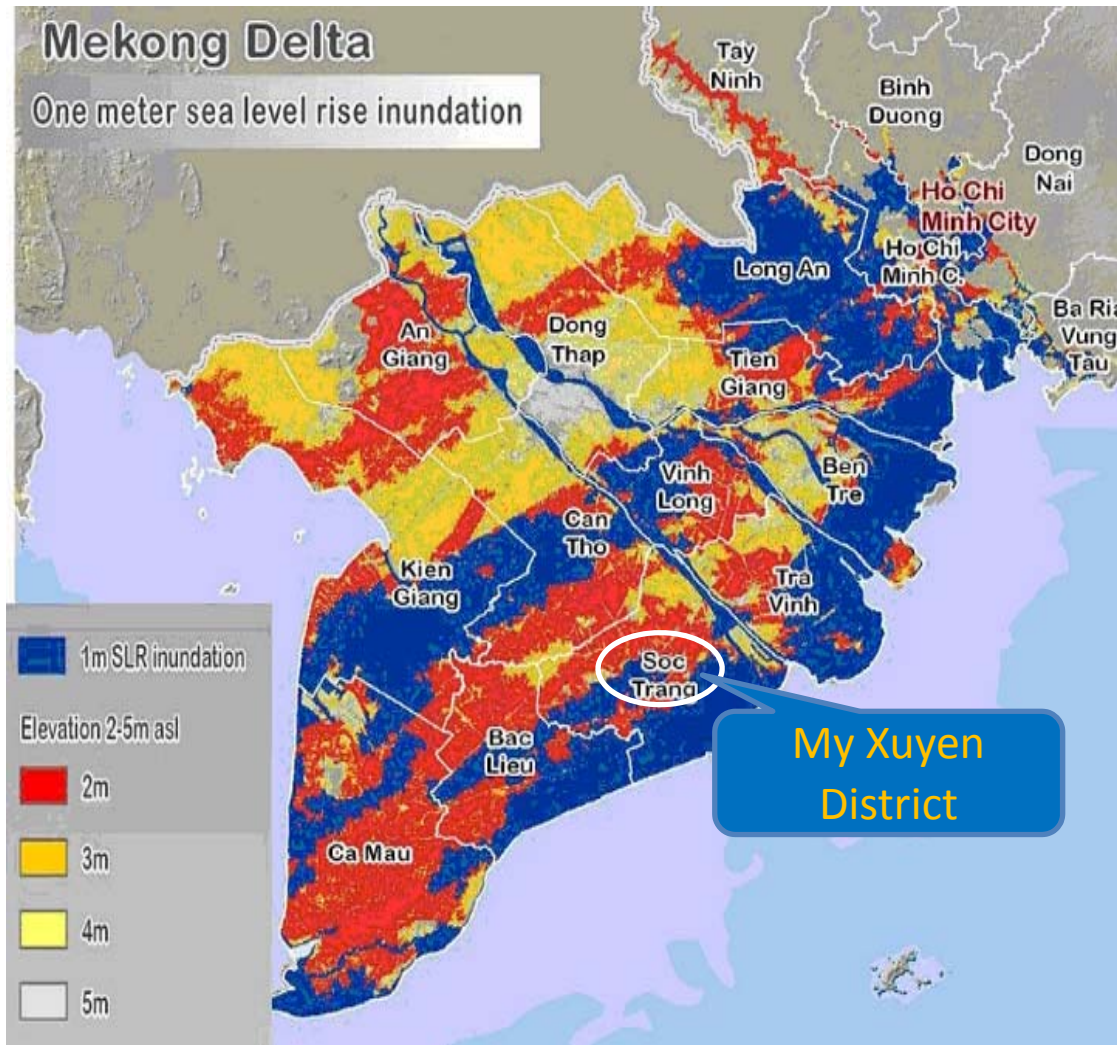
Study objectives:

Evaluate the potential of **Integrated shrimp-rice** practice as a CSA to cope with CC.

Research questions:

- What is performance of SR production?;
- To what extent do SR contribute to rural HH's income/food security, resilience & mitigation to to CC?

Methodology



Study site:

My Xuyen dist., Soc Trang prov.



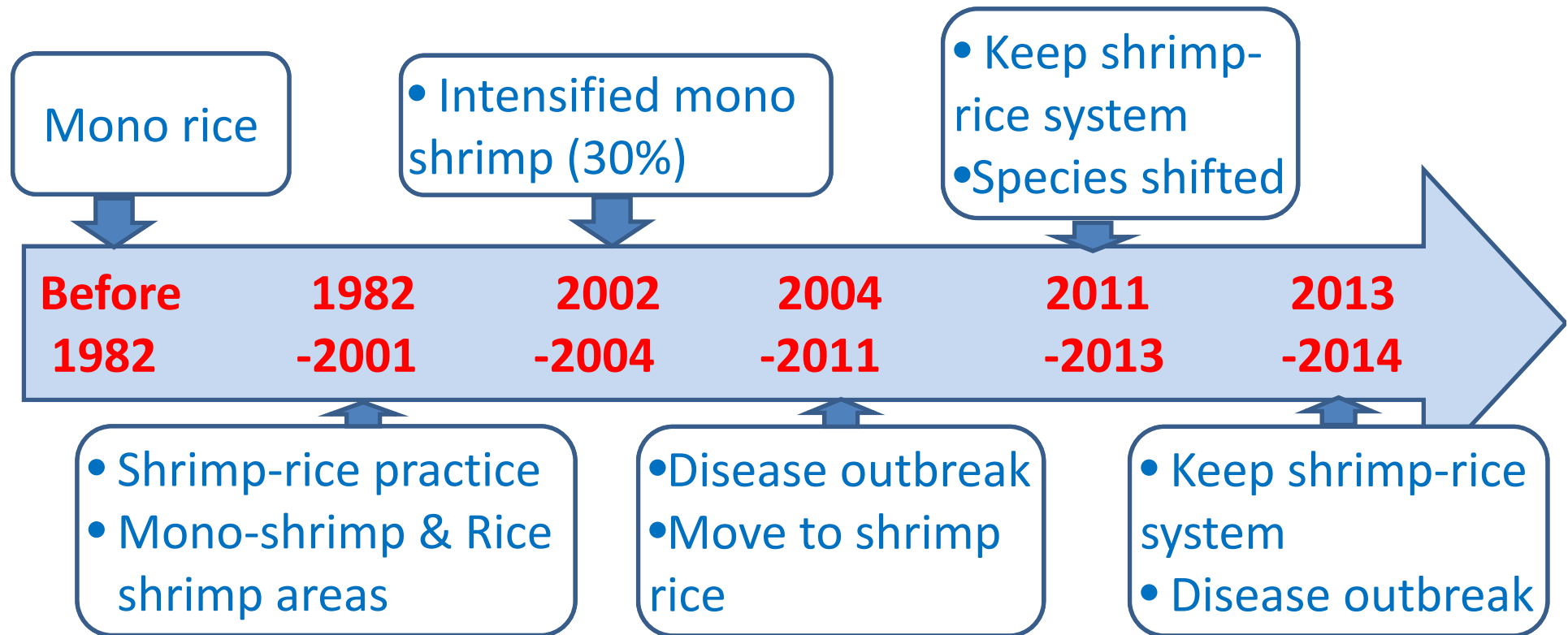
- 2FGDs + 1 SW
- HH survey in 9 communes (2014)

Methodology

		Farming type		
		Shrimp-rice	Mono-shrimp	Total
Surveyed commune	Gia Hoa 1	8	2	10
	Gia Hoa 2	12	1	13
	Hoa Tu 1	6	4	10
	Hoa Tu 2	7	19	26
	Ngoc Dong	14	9	23
	Ngoc To	3	15	18
	Tham Don	0	6	6
	Thanh Phu	3	4	7
	Thanh Quoi	11	2	13
	Total	64	62	126

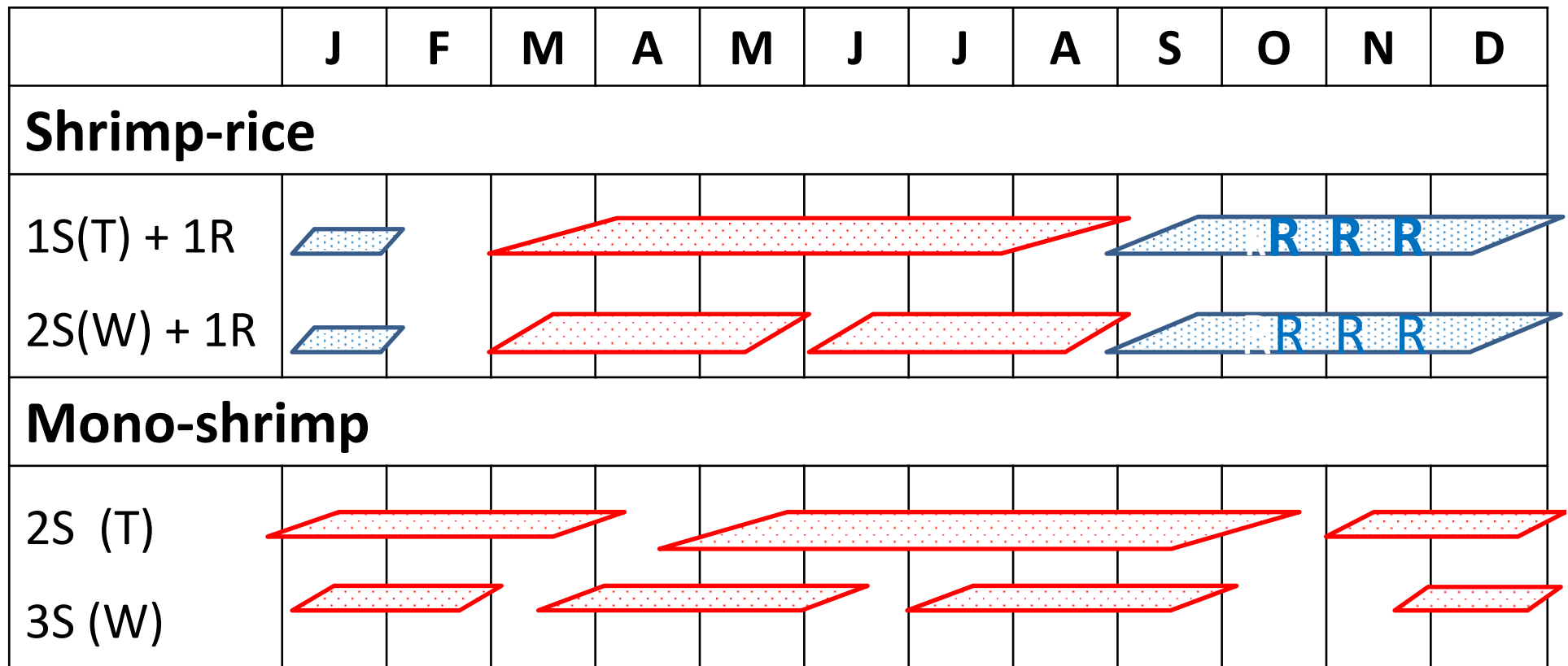
Results

Historical development



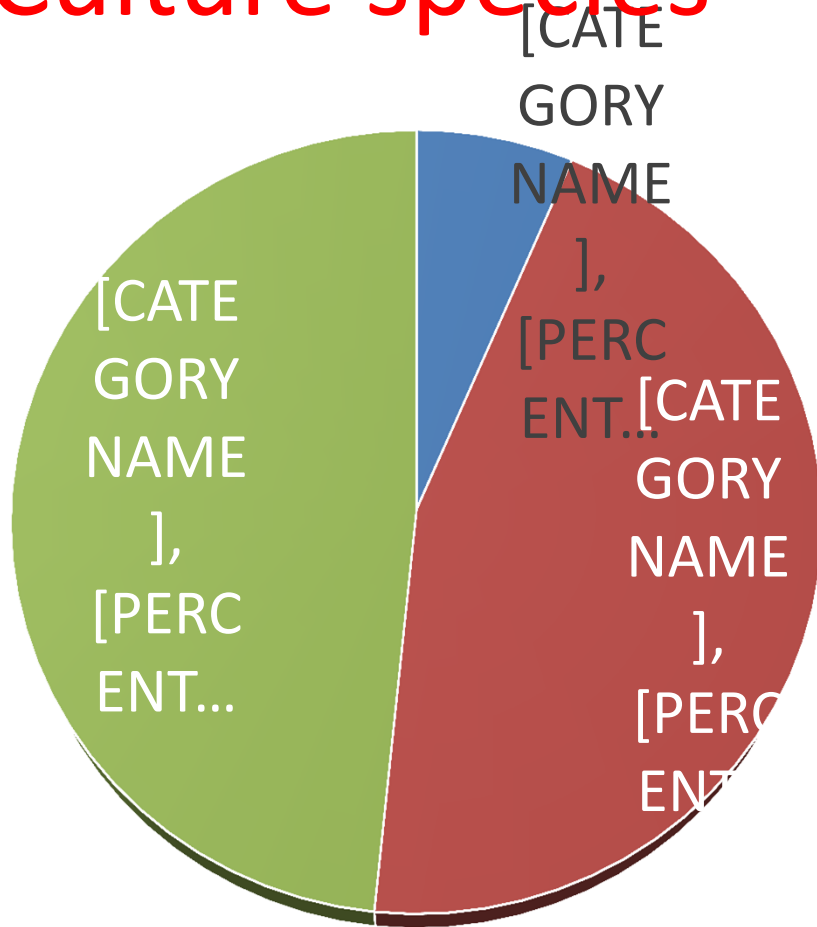
Results

Crop calendar

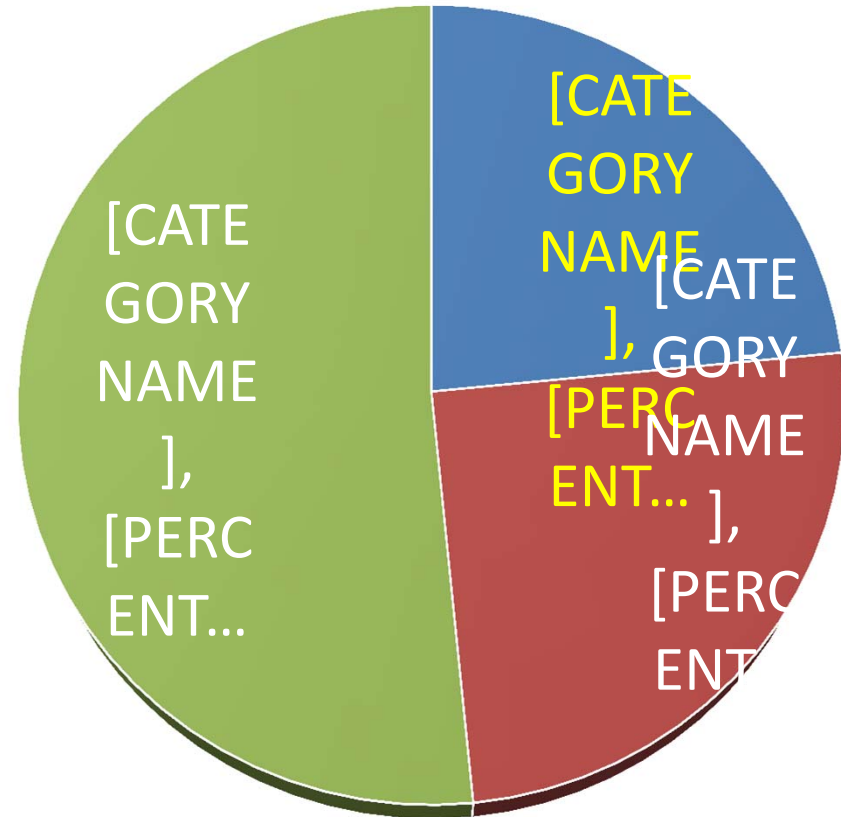


Results

Culture species



Mono-Shrimp



Shrimp-rice

Results

Production performance

	Farming type			
	Shrimp-rice		Mono-Shrimp	
	M	Std. Dev	M	Std. Dev
Shrimp area (ha)	1.04	0.61	1.20	0.80
Rice area (are)	0.71	0.42	-	-
Shrimp stocking density (ind. m ⁻²)	14.10	12.42	16.47	15.32
Shrimp yield (kg ha ⁻¹)	595.88	499.64	1,170.95	994.92
Rice yield (kg ha ⁻¹)	5,569.26	2,113.34	-	-

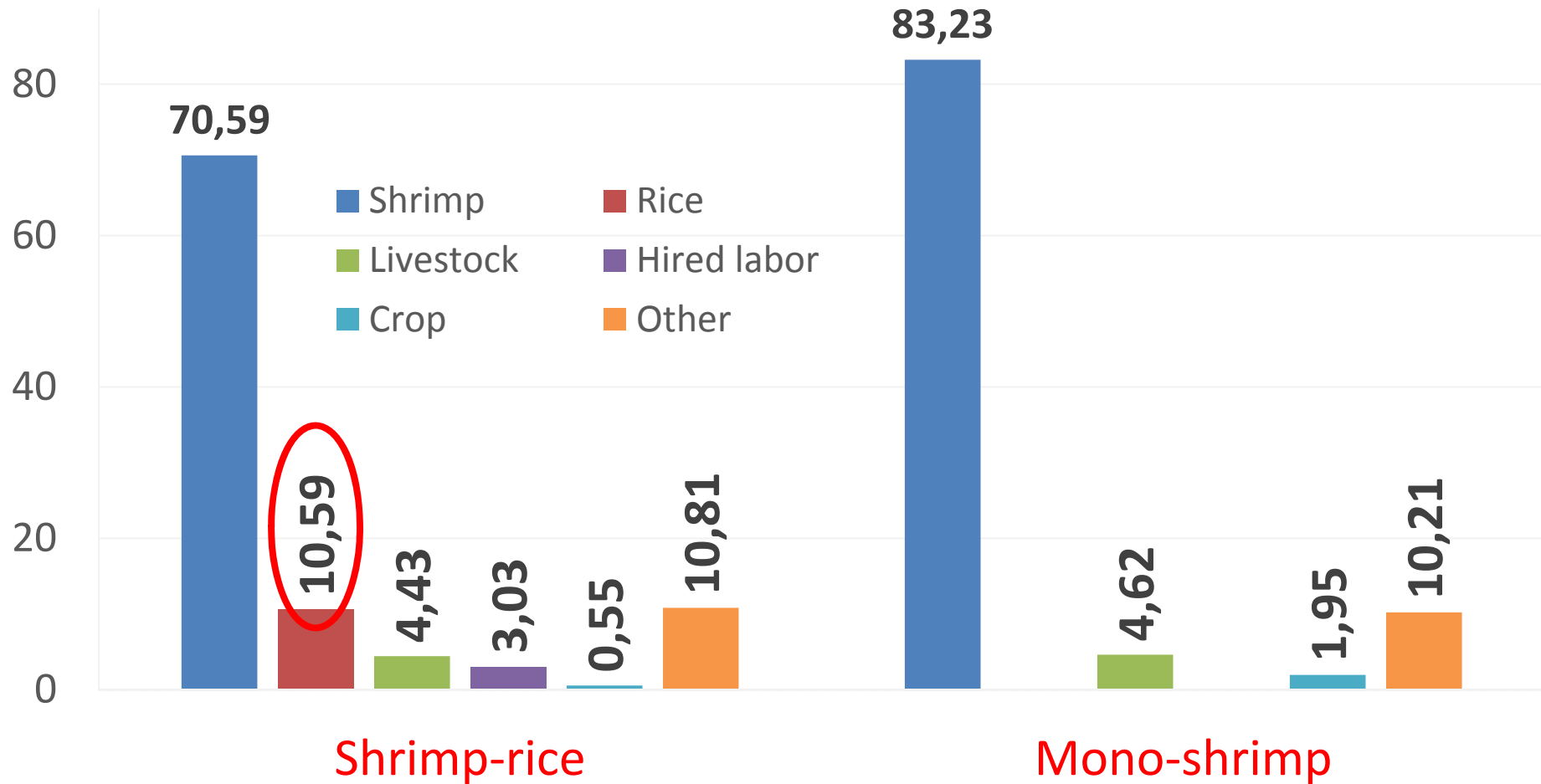
Results

Production income

Net profits (VND mil./HH/year)		N	Mean	Std. Deviation
Shrimp	Shrimp-rice	64	<u>60.87</u>	199.52
	Mono-Shrimp	62	115.92	217.86
Rice	Shrimp-rice	64	<u>19.88</u>	12.44
	Mono-Shrimp	62	-	-
Total	Shrimp-rice	64	<u>80.76</u>	196.83
	Mono-Shrimp	62	115.92	217.86
	Total	126	98.06	207.36

Results

HH's income share



Results

Contribute to reduce GHG emission

Input use (vnd .000/kg)		N	Mean	Std. Deviation
Petrol	Shrimp-rice	43	4.32	4.67
	Mono-shrimp	53	5.85	14.20
Chemicals	Shrimp-rice	52	12.47	10.75
	Mono-shrimp	57	13.25	22.73
Electricity	Shrimp-rice	27	5.65	4.24
	Mono-shrimp	46	6.41	4.64
	Total	73	6.13	4.48

Results

Contribution to reduce GHG emission

	Estimated by officer	Survey
Total revenue	42.00	33.88
Total costs (VND mil./ha)	23.58	11.55
- Chemicals/Fertilizers (VND mil./ha)	12.09	4.09
Total benefits(VND mil./ha)	18.42	22.33

Results

CSA perception

Q: Evaluate the SMART ability of the SR system to response to impacts of CC (likert scale from 1-5) :
1= Not at all to 5 = Very much

CSA_Q1	Increase HH's income
CSA_Q2	Increase HH's food production
CSA_Q3	Reduce risks from CC & disease outbreak
CSA_Q4	Increase resilience & reproduction
CSA_Q5	Reduce use of chemicals & fertilizers
CSA_Q6	Reduce soil degradation
CSA_Q7	Reduce water pollution

Results

CSA perception

	Shrimp-rice (N=64)	Mono-shrimp (N=62)	Total (N=126)
CSA_Q1	4.02	3.98	4.00
CSA_Q2	4.14	4.18	4.16
CSA_Q3	4.23	4.15	4.19
CSA_Q4	4.25	4.32	4.29
CSA_Q5	4.41	4.42	4.41
CSA_Q6	4.30	4.37	4.33
CSA_Q7	4.20	4.21	4.21
Cronbach's Alpha	0.85	0.87	0.86

Conclusions

Economics:

- Better financial security
- Food security for the farm HH

Environment:

- Less use of chemicals & fertilizers
- Reduce soil degradation & water pollution

Social issue:

- Reduce inequality

Recommendations

- Detailed planning for SR area, including infrastructure development.
- Research on high salinity tolerance rice
- Formation of associations/cooperatives
- Increase awareness on CC & its impacts

Thank you !



“Shrimp must be clean, rice must be quality. Rice is for HH food, while shrimp is to get rich. If only shrimp, there would be no food in case of risk. If only rice, it's hard to become rich”

