Progress of Joint Research Activities

Research No.: ㉛ E-11 **ODA Loan Joint Research** | **Date:11/Oct/2018**

1	General Title	To study the resilience of different farming systems in the context of extreme weather events and environmental degradation
2	Core Members	CTU: Le Tan Loi (Project Leader), Pham Thanh Vu, Van Pham Dang Tri, Vo Thanh Danh, Ngo Thi Thanh Truc.
		Japanese Universities and Companies: Hamasaki (Nagasaki)
3	Duration	Jan 2019 – Dec. 2021 (3 years)
4	Main Objectives	Study of establishment of solutions coped with environmental changes and climate changes for sustainable development of agriculture and aquaculture at a small scale in Mekong Delta
5	Focal Points:	The resilience of different farming systems

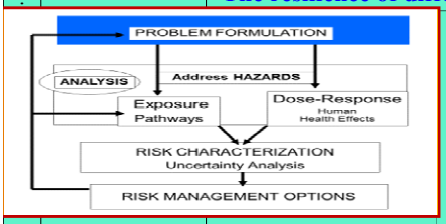


Figure 1: Conceptual framework

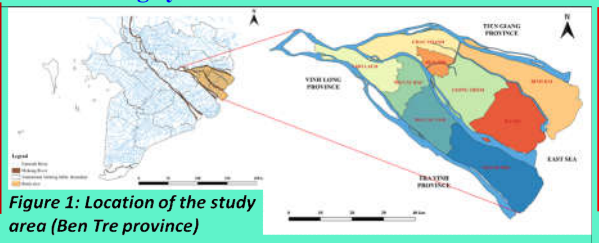
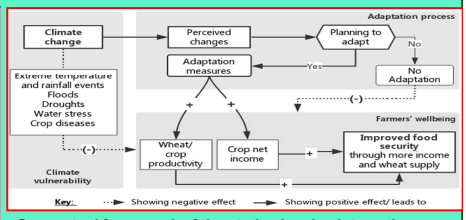


Figure 1: Location of the study area (Ben Tre province)



Conceptual framework of the study showing interactions among climate change, adaptation and farmers' wellbeing

Topic 1: Risk assessment of typical agriculture and aquaculture farming systems under affecting of projection of climate patterns in 2030s

Results

- The extreme saline water intrusion from late 2019 to early 2020 resulted in serious freshwater scarcity, causing negative impacts to agriculture and aquaculture in the study area.
- The surface water resources state management during the study period were remarkable to reduce the saline water intrusion induced damages.
- The execution of documents still remained limitations due to actual local conditions and some proposed surface water management solutions was still temporary and ineffective.

Further activities	*Time*
Characterizing surface water resources at each zone of the agro-ecological map in Ben Tre.	10/2020 – 03/2021
Collecting secondary data to identify risks water-related factors.	10/2020 – 12/2021
Collecting data for assessment risks of agriculture and aquaculture under the extreme climate change scenario.	12/2020 – 06/2021

Topic 2: Evaluation of soil degradation under effecting of climate change (as salinity intrusion, drought state, and inundated state) of agriculture and aquaculture farming systems.

The changing of salty boundaries from 2015 – 2019 in Ben Tre province

Results of study

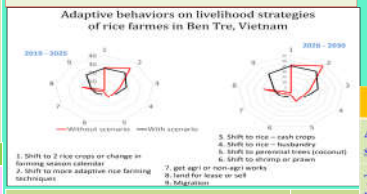
The economic efficiency of land use type of shrimp was highest, next is durian, upland crops, rambutan, rice and coconut trees.

The results were showed that districts of Binh Dai, Ba Tri, Thanh Phu, Giong Trom, Ben Tre city and a part of districts as Mo Cay Nam, Mo Cay Bac, Chau Thanh and Cho Lach were also affected by salinity intrusion, with salinity levels ≥ 4‰.

Further activities	*Time*
Impacting of the factors on the resilience of land use pattern in Ben Tre province.	01/2021 – 04/2021
Evaluation on the resilience of the land use pattern in Ben Tre province	01/2021 – 04/2021
Evaluation on the change of soil properties of the land use pattern un the salinity intrusion in Ben Tre province	04/2021 – 06/2021

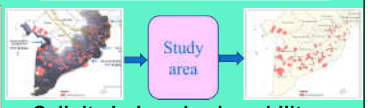
Topic 3: Estimate change in income of households of the rice based - farming systems, the fruit based – faming systems due to the impact of climate change.

- A survey of 360 rice farmers in Giong Trom and Ba Tri district, Ben Tre Province was conducted in 2019.
- Rice yield and income were affected significantly due to the saline intrusion in 2016.
- About 30% of rice farmers have responded autonomously and with support and advice from the local government after 2016, i.e. reduced one rice crop in the dry season, shifted to more adaptive rice varieties to the market demand and saline intrusion, coconut plantation.
- The scenarios of saline intrusion in Ben Tre Province in 2015 – 2070 issued by the MENR were introduced to rice farmers to measure their intentive behavior to their livelihood in 2019 – 2025 and 2026 – 2030.



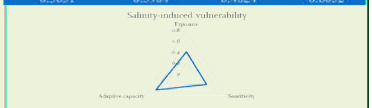
Further activities	*Time*
Impacts of saline intrusion to rice yield and income of the rice farmers in Ben Tre	10/2020 – 06/2021
Choices of mangosteen growers in shifting to more adaptive livelihood strategies to saline intrusion in Ben Tre	10/2020 – 9/2021

Topic 4: Assessing the role of communities and institutions in developing policies for water using and management of rice and aquaculture-based farming systems in the context of severe weather and environmental destruction.



Salinity-induced vulnerability of rice-based models

Social vulnerability	Exposure	Sensitivity	Adaptive capacity
0.3651	0.3964	0.4024	0.6052



Social Assets	Human Assets	natural Assets	Financial Assets	Physical Assets	Livelihood
0.4024	0.6360	0.1552	0.1893	0.3583	0.6273

Results of study

Among 800 rice-based farmers, the social vulnerability at salinity-induced regions is relatively low.

The adaptive capacity is relatively high with positive human assests and livelihood effects with negative natural and financial effects.

Further activities	*Time*
Investigate **the irrigation investment in salinity-induced prone**.	10/2020 – 05/2021
Community-based assessment onhow to adapt to extreme events (salinity/drought) in rice-based models	01/2021 – 05/2021

Reference:

Mai Xuan, Le Tan Loi, Pham Thanh Vu, 2019. Applying kriging interpolation method in compiling the saline intrusion map for Ben Tre province. Viet Nam Soil Science Journal No 57/2019.

Mai Xuan, Le Tan Loi, 2020. Production state and economic efficiency of land use types in Ben Tre province. Viet Nam Soil Science Journal (Prep)

THE RESEARCH INFORMATION:

+ Main research institute: Cantho University +The total budget: 2,181,120 (mi. VND)

+ Japanese collaborator: Nagasaki and Kyushu University + Research region: Mekong Delta (Ben Tre Province)

6	Comments	NO

Table 1: Program timeframe

Content	2019				2020				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Reconnaissance trip												
Building the questionnaire & Collection of secondary data												
Conduct field survey												
Primary data collection												
Data analysis												
Publishing (Domestic papers & International papers)												
Discussion to finalize the report												
Workshop												