Youth Connect

Youth Community Resilience to Climate Change in the Mekong Delta (Y-CoRe)

Evaluating the impact of salinity intrusion on farming households' livelihoods – A case study in Tan Phu Dong District, Tien Giang Province

Project background

The research was conducted to assess rural household livelihoods and propose sustainable livelihood solutions in Tan Phu Dong District, Tien Giang Province. As a remote coastal area with limited access to freshwater for irrigation and daily use, Tan Phu Dong has been severely affected by climate change, especially by increasing salinity and drought.

Preliminary surveys show that many inefficient agricultural models exist in the district, with households operating independently and inconsistently across regions. There is currently no in-depth research analysing local livelihood models in terms of economics, natural resources, society, and the environment.

Therefore, this study aimed to evaluate the existing livelihood models and propose suitable farming practices for different sub-regions, helping households optimise their livelihoods. The research findings will serve as scientific evidence for local authorities to design adaptation and mitigation programmes that reduce the impacts of climate change on rural livelihoods and contribute to securing sustainable living conditions for coastal communities.

Project objectives

- Analyse the cost-benefit efficiency of local livelihood models.
- Assess the impact of saltwater intrusion on changes in livelihood strategies.

Project overview

The study used multi-temporal Sentinel-1 satellite imagery to develop a current land-use map of Tan Phu Dong District. The images were classified using a supervised method with the Random Forest algorithm, and the reliability was assessed based on overall accuracy and the Kappa coefficient.

The research also involved determining sample sizes and locations based on the interpreted land-use types, designing household interview questionnaires, and conducting surveys with local farmers.

Finally, the study standardised the data and analysed livelihood characteristics under the influence of saltwater intrusion through five capital types: human, natural, social, physical, and financial.

Outstanding outcomes

The study developed a current land-use map of Tan Phu Dong district, identifying five land-use types: rice-shrimp farming, lemongrass cultivation, other annual crops, perennial crops, and aquaculture. The map achieved an overall accuracy of 89.52 per cent and a Kappa coefficient of 0.85.

A structured questionnaire was also developed to interview farming households, gathering information on salinity intrusion and livelihood capital sources. A total of 113 households with farming models affected by salinity intrusion were interviewed, including those cultivating lemongrass (25 households), other crops (17 households), rice-shrimp (12 households), shrimp (26 households), and coconut (33 households).

The analysis of livelihood capital revealed that human, financial, and natural capital play a crucial role in the livelihoods of local farmers in the context of increasing salinity intrusion. Among these, natural capital was particularly significant in influencing livelihood transitions in the area.

The lemongrass and specialised shrimp farming models demonstrated high economic efficiency, generating diverse income streams for local residents alongside their agricultural activities. Prior to 2015, the area suffered from severe salinity intrusion due to being surrounded by the sea on all four sides, lacking freshwater for daily use and irrigation. Crop productivity was low due to water scarcity, forcing many households to seek employment in other regions.

Since 2015, thanks to local government efforts, dike systems have been constructed, and freshwater pipelines and irrigation systems have been extended from inland areas, helping to revive the region’s agricultural sector. Moreover, the development of salt- and drought-tolerant crops such as coconut and lemongrass, along with adaptive farming models like shrimp and rice-shrimp systems, has significantly improved household livelihoods in recent years.

Team member's information

- Pham Hoang Tu, Land Management, Can Tho University
- Do Nguyen Tuan Anh, Land Management, Can Tho University
- Nguyen Van Hoang Thanh, Land Management, Can Tho University
- Nguyen Hong Ngoc Ngan, Land Management, Can Tho University