

# Assessment of Impacts of Climate Change on Agriculture and Fisheries in the Coastal Areas of Thua Thien Hue Province, Vietnam

By Mac Nhu Binh <sup>1</sup>, Le Duc Ngoan <sup>1</sup>, Le Thi Hoa Sen <sup>1</sup>, Nguyen Thi Thanh Thuy <sup>2</sup>, Jennifer Bond <sup>3</sup>, Truong Van Dan <sup>1</sup>, and Le Thi Hong Phuong <sup>4</sup>



Photo by Do Huu Tuan

*Vietnam is one of the five countries predicted to be the most affected by climate change due to its long coastlines; high concentration of population and economic activity in coastal areas; and heavy reliance on agriculture, natural resources, and forestry (World Bank 2011).*

Located in Central Vietnam, Thua Thien Hue's agricultural and fisheries sectors have always been negatively affected by climate change. Recognizing the problem, in recent years, Thua Thien Hue province has developed many policies and action strategies to mitigate the impacts of climate change. Thua Thien Hue Provincial People's Community assigned the responsibility to the Department of Agricultural and Rural Development (DARD) and the Department of Natural Resource and Environment to carry out the Provincial Target Program on climate change. Sadly, the program implementation has been said to primarily focus on building response capacity, such as having annual evacuation plans, training people in disaster drills, and providing weather data to local authorities; lacking a long-term planning perspective (Mendoza 2014).

Upon the implementation of the action plan, many questions have been raised to the policymakers: (1) What are the actions or policies that mitigate the effects of climate change? (2) How do we assess and identify climate change factors that affect agriculture and fisheries? (3) How do people adapt to climate change to mitigate its effects on agricultural production?

To evaluate the impacts of climate change on agriculture and fisheries in the coastal areas of Thua Thien Hue province, information were gathered through research, farmer interviews, and from secondary sources.

The research results showed that Thua Thien Hue province suffered heavy losses from climate change. Over time, the province's weather conditions and climate showed



complicated movements and prolonged heatwaves often occurring during the dry season resulting to drought. Drought is the main factor affecting rice production, agricultural land use, and crop and water resources. According to the farmers, the area for rice production, yield, and income of farmers have decreased annually. Agricultural land was reduced between spring and summer season, soil quality was degraded, and water volume for agricultural production was reduced. Livestock activities such as cattle and poultry raising were also negatively affected by drought.

Meanwhile, cold weather lasted longer during the rainy season. Floods and typhoons have occurred with stronger intensities, while tide amplitude has changed drastically. The higher frequency of floods caused a decline in lagoon resources and number of fishing days. The change in the flood regime (i.e., floods during the rainy season and early flood in “*tiêu man*”) has altered the livelihood activities of fishers and aquaculturists.

Other impacts on aquaculture activities include decreased aquaculture area, change in structure of animal breeding and crop season, and reduced yield

and productivity. The system of lakes and dams for brackish water aquaculture was also damaged (DARD 2012). Many people engaging in aquaculture have converted from intensive culture to extensive culture; others left their ponds and moved to other jobs, resulting to significant changes in income.

The people have a limited understanding of climate change, thereby affecting their ability to respond to and prepare for the changes in their environment, resulting to heavy losses in fisheries and aquaculture production.

Moreover, in spite of the development intervention given by various government agencies, the efforts of the people to respond to natural calamities have been minimal.

Effective solutions in response to climate change are yet to be found. It is therefore imperative to address the need for policies that would integrate adaptation measures into the overall development plan of the fishery sector. This would be crucial in helping the people respond better to climate change in order to ensure sustainable development.



Photo from: Salt Lake Tribune





Photo by: Myo Min Kywe

## Recommendations

Based on the information gathered during the research, the following are recommended:

### *For agricultural production*

- Adjust cropping calendar, select rice varieties resistant to drought and high salinity, and implement the suitable technical practices for each crop.
- During the dry season, convert the area of cultivated rice and vegetables to aquaculture, in the coastal and lagoon areas, to limit the impact of sea level rise and salinity intrusion.
- Intensify research and development of agricultural technology to improve the quality and increase production while protecting the environment.
- Develop and implement afforestation projects on sand dunes along beach and mangrove areas to improve the coastal ecosystem.

- Develop a new flood management plan for dikes and irrigation system in order to protect and utilize the cultivated areas effectively.

### *For the fisheries/aquaculture sector*

- Revert to the original state of lagoons. Focus on high tide feeding areas. Build fish cages that are resistant to strong waves.
- Develop safe aquaculture areas under sustainable development strategies. The identification of suitable culture location can also avoid the phenomenon of prolonged drought, floods, and the sudden change in salinity ponds.
- Strengthen the dissemination of knowledge and information; raise the awareness of officials and locals about the impacts climate change, as well as the methods and strategies for adaptation and mitigation.



Figure 1. Species use in polyculture

- Persuade farmers to strictly abide by government policies and implementing rules and regulation of functional agencies on issues related to aquaculture; specifically, compliance with schedule and stocking of encouraged species. Quality assurance protocol must be enforced.
- Prioritize native species that have been cultured and have adapted well. Identify hybrid species and polyculture species capable of co-existence, that could have good economic value and high market demand.
- Speed up the implementation of the government's support policies to mitigate the damage caused by natural calamities and epidemics in aquaculture.



Rabbitfish (*Siganus guttatus*)



Grouper (*Epinephelus aeneus*)



Kinh (*Siganus canaliculatus*)



<sup>1</sup> Hue University of Agriculture and Forestry, Hue University. 102 Phung Hung, Hue, Vietnam  
<sup>2</sup> University of Social Sciences and Humanities, Vietnam National University, Hanoi, Vietnam  
<sup>3</sup> Faculty of Law – Graduate Studies, University of Ottawa, Canada  
<sup>4</sup> Wageningen University and Research, Wageningen, Netherlands

References:

DARD (Department of Agriculture and Rural Development of Phu Vang District). 2012. Aquaculture Situation in Phu Vang District. Final report (in Vietnamese). Annual Report of the District, Phu Vang, Thua Thien Hue, Vietnam.

Mac Nhu Binh, et al. 2017. "Impact of Climate Change on Aquaculture in Phu Vang District, Thua Thien Hue Province, Vietnam". SEARCA Discussion Paper Series 2016-3. Los Baños, Laguna, Philippines: SEARCA.

Mendoza, M.E.T., B. D. The, H. Naret, V.G. Ballaran, Jr., and J.K.B. Arias. 2014. "Assessing Vulnerability to Climate Change Impacts in Cambodia, the Philippines and Vietnam: An Analysis at the Commune and Household Level". *Journal of Environmental Science and Management* 17(2): 78-9.

World Bank Group. 2011. Vulnerability, Risk Reduction, and Adaptation to Climate Change-Vietnam: Climate Risk and Adaptation Country Profile. Retrieved March 2018 from [http://sdwebx.worldbank.org/climateportal/doc/GFDRRCountryProfiles/wb\\_gfdr-climate\\_change-country\\_profile\\_for\\_VNM.pdf](http://sdwebx.worldbank.org/climateportal/doc/GFDRRCountryProfiles/wb_gfdr-climate_change-country_profile_for_VNM.pdf)

Packaged into an Agriculture and Development Note by  
Mariliza V. Ticsay and Zara Mae C. Estareja