

Climate Variability and Socioeconomic Vulnerability of Aquaculture Farmers in Malaysia

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Abstract. The aquaculture sector has undergone significant transformation in increasing food security for the nation as well as enhancing Malaysian Economic growth. This sector is put under the consideration of the Third National Agricultural Policy (1998-2010) in order to become the major area of concentration in fisheries production to improve the competitiveness of agriculture sector in Malaysia. At the national level, the development of aquaculture sector serves to resolve the insufficient fish supply as the main protein source of the household and reduces the social problems such as poverty, malnutrition and income inequality of the aquaculture farmers. Although the physical and financial drivers play their roles well in enhancing this sector, the climate variability provides major challenges in sustaining future outlook of aquaculture sector. Furthermore, the climate fluctuation raises the socio-economic vulnerability to aquaculture farmers due to the high production cost and production loss. The major concern of this study is to identify the association between climate variability and socio-economic vulnerability of the aquaculture farmers. Primary data was obtained from 120 aquaculture farmers in Sarawak, Malaysia. The findings revealed that there is significant association between climate variability and production loss especially when the water temperature changes and there is pandemic disease outbreaks. However, all factors have small effect on the aquaculture production loss. From the farmers' view, other factor such as less dissolved oxygen, drought season, raining season and flood event were also factors that contributing to production loss. The results suggest that an effective and accurate adaptation strategy is needed to help aquaculture farmers cope with the climate variability impacts in their production.

Keywords: climate variability, socio-economic vulnerability, aquaculture sector, production loss.

1. Introduction

Malaysia's aquaculture sector development and growth since 1920's had helped to overcome the decreasing of fish stock due to over exploitation fishing activities in coastal area by the commercial fishery (Tan, 1998; CICS, 2000). The aquaculture industry promotes technological transformation and drove to the high market contribution by fulfilling the domestic demand for high protein resources and export demand of fish products. The performances help to sustain the national economic development as targeted by the government that is to achieve the growth of food production by 33.4% or 1.8 million metric tonnes for fisheries sector (Malaysia, 2008). With respect to socio-economic development, aquaculture sector is involved in improving food supply, create employment and increasing the farmers' income (Safa, 2004). Aquaculture activities help to reduce the poverty problem especially in rural areas although they are still practicing traditional aquaculture techniques (Edwards, 2000). The development of aquaculture activities in the rural area has benefited the farmers and the nearby community due to the increase allocation of infrastructure such as electricity, communication system and road access which improve their quality of life (Mohd. Fariduddin, 2006).

Climate variability is an environmental factor that is strongly associated to aquaculture productivity. Environmental and social aspects are important keys in ensuring sustainable and safe aquaculture production (Anon, 2003). In Malaysia, variance in temperature and precipitation, flood and drought seasons and water deterioration and stratification are events that indicate climate variability. The extreme patterns of climate

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