Sustainable Aquaculture Technologies: Adoption Readiness, Perceived Behaviour and Determinant Barriers among the Fish Farmers in Penang, Malaysia

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ABSTRACT

Aquaculture has been the world's fastest-growing food production sector for the last two decades. Collectively, the local aquaculture sector produced 391,000 tonnes of cultivated organisms, with an economic value of over USD 700 million, accounted about 0.2 percent of Malaysia's gross domestic product (GDP) in 2019 (Azra et al., 2021). Penang's aquaculture production gained the highest wholesale revenue in Malaysia. Brackish water ponds and cages constitute the majority of Penang's aquaculture and reported the highest number of culturists. Fisheries from brackish water have been contributing nearly 50% of the total fish production, and about 69% of its value in Penang (Penang Institute, 2020). Of these, sea bass and snapper recorded the highest production, followed by shrimp, cockle and other brackish water cages species, such as hybrid grouper and mackerel. Technology and practice adoption research has recently gained popularity in the area of aquaculture studies (Joffre et al., 2020). A variety of factors have contributed to the low output. A lack of knowledge about recommended fish farming practices is one of the socioeconomic characteristics of fish farmers and non-adoption (Muddassir et al., 2016). Lack of livelihood asset, either physical or human assets particularly in terms of knowledge, access to information, and experience, and aspects of sustainability in terms of environmental conservation. The issue of production sustainability, employment of improved technology, concept of eco-friendly, and food safety regulations are known challenges for the aquaculture industry. Furthermore, constraints such as the education and knowledge, human greed, irresponsible, short-sighted activities, small farm size and investment, uprising cost of production and weak legislation and enforcement are generally common among the aquaculture farmers (Othman, 2010). With the aforementioned, this research is aimed to access extension and advisory services, adoption of aquaculture technology, and determine the barriers that threatened the sustainability of the aquaculture industry.

Keywords: Adoption; Aquaculture; Barriers; Sustainable; Technology