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CLIMATE CHANGE EFFECTS ON AQUACULTURE PRODUCTION PERFORMANCE IN MALAYSIA: AN ENVIRONMENTAL PERFORMANCE ANALYSIS

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ABSTRACT

This study identifies the effects of climate variability as an environmental pressure on aquaculture production in Malaysia. Using Malmquist index approach, the analyses were applied to brackish-water ponds and cage aquaculture sectors in six states in Malaysia from 1993 to 2013. The Dynamic Malmquist Data Envelopment Analysis results had reflected that environmental technical change is the main factor behind the improvement of environmental performance index in pond production while the relative eco-efficiency is the major influencing factor in environmental performance index in cage aquaculture. Moreover, Pahang is the most efficient states in environmental aspects and technical support of brackish-water aquaculture ponds and cage activities, while Selangor is the least efficient state in aquaculture activities and under high climate change risks.

Keywords: Aquaculture Production; Climate Change; Environmental Performance Index; Relative Eco-Efficiency; Environmental Technical Change.

1. INTRODUCTION

Increased world demand on fish protein and over exploitation of fisheries have encouraged the development of aquaculture sectors, especially in developing countries within the Asia Pacific region. It has been estimated that in recent years, the world population has increased to about 7.8 billion people and due to this growth, 2.2 million metric tons of fish should be produced to fulfill the demand of fish consumption per year. The rapid development of aquaculture throughout the world and their significant contribution to the world's fish supply have increased gradually where the aquaculture contribution to total fish production increased from 23.9% in 1990, 25% in 1995, 40.2% in 2000 and 54.6% in 2012. In 2006, aquaculture

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