

Evaluating contextual factors affecting the technical efficiency of freshwater pond culture systems in Peninsular Malaysia: a two-stage DEA approach

ABSTRACT

The demand for animal protein, especially fish, is growing fast, perhaps due to the rapid expansion of populations, increases in income and changes in eating habits and life styles. Capture fisheries, which supply over 70% of the fish for human consumption in Malaysia, are over-exploited or depleted. Their yields have become stagnant over the last few decades and in some cases have even declined. Nevertheless, aquaculture has the potential to meet these challenges if practised well. This study therefore aims to estimate the technical efficiency of pond culture systems using data envelopment analysis (DEA). In addition, it investigates the determinants of technical efficiency by employing an ordinary least squares (OLS) regression model. The estimated technical efficiency of pond culture was found to be 0.86, which means that the fish farmers in our sample could reach full technical efficiency through reducing their input usage by 14% with the current level of technology to produce the same output levels. The results of the OLS regression indicate that farmers' age, experience, extension training and water management have positive and statistically significant impacts on technical efficiency. Information on water management practices could be passed on by extension agents to inefficient farms to assist them in catching up with the farms demonstrating best practice.

Keyword: Technical efficiency; Slacks variables; Data envelopment analysis; Inefficiency; Aquaculture