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Firm Efficiency and Returns to Scale in Catfish Production among Smallholders

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Abstract

Firm efficiency and productivity analyses are important considerations in measuring performance of a farm business. Despite its potentials, the level of catfish production has failed to meet domestic demand in Nigeria. This study analyzes the determinants and returns to scale in catfish production among smallholders in Ekeremor, Bayelsa State, Nigeria. Primary data collected via random sampling were evaluated using descriptive statistics, regression and elasticity of production analysis. The results revealed the estimated mean for farming experience, average feed quantity per cycle, stocking density per average pond size, quantity of labour and average pond size; were 9 years, 3000kg, 1020 fingerlings per 482 sq.m and 300 man-days respectively. The coefficient of multiple determination (R^2) was 0.787, implying that 79% variation in catfish output among smallholders was accounted for by the variables in the regression model The estimated value of returns to scale was 0.743($\sum\rho<1$); indicating a decreasing return to scale. Moreover, the major constraints of catfish production include high feed cost (95%), inadequate capital (80%), pond construction cost (73.3%), poor market linkages (70%) and poor access to modern technologies (65%). Alternative feed sources, adoption of practices and technology, financial and credit information, feed, construction materials and equipment subsidy, improved market linkages, extension contact, access to and adequate supply of water, production inputs, technological innovations and cooperative formation are strongly recommended.

Keywords**:** Catfish, constraints, determinants, elasticity of production, farm output, smallholders

1.0 INTRODUCTION

The aim of fish farming (husbandry) or aquaculture is generally for fish production for human consumption. The term fish is a diverse group of animals that live and breathe in water by means of gills (https://manoa.hawaii.edu/exploringourfluidearth/biological/fish/what-fish). Aquaculture continues to grow rapidly. Understanding the general aspects of aquaculture is of increasing importance for all those working in this industry. Aquaculture requires specific knowledge and skills on general aspects of fish production (Emokaro, 2010). In the past, rural fish farming in Africa concentrated on tilapia fish production however catfish production is also on the rise (Olagunju *et al.,* 2007). Population growth is usually accompanied by increase in demand for basic necessities of life (i.e. food, clothing and shelter). This is the case with the unrestricted increases in the demand for protein rich food items of animal origin (Ugwumba and Chukwuji, 2010). However, the ability of catfish production to reach optimal level has been on the decline, yield (output per unit water area) for catfish farmers and the profit margins have decreased overtime. The Food and Agriculture Organization (FAO), (2006), recommended that an individual takes 35g (grams) of animal protein per day for sustainable growth and development. However, the

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