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Examining the Micro-level Sustainability Status of Conventional and Organic Rice Farming Systems of Coastal Kerala, India

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Abstract

Agricultural sustainability has been defined as the ability of the farming system to maintain its productivity and utility indefinitely. The present study attempts to analyse the microlevel sustainability status of conventional and organic rice farming systems of Coastal Kerala (India), and evaluates the structural differences existing between the sustainable and unsustainable farms. Two farming systems were selected for the study — Kuttanad for conventional and Pokkali Lands for organic rice farming. The sustainability analysis comprises of formation of an index, taking following indicators into account: (i) economic (gross income per hectare and benefit-cost ratio) , (ii) energy (net energy efficiency, net economic productivity of energy, and net energy productivity of capital), (iii) farming (fertiliser productivity and pesticide productivity), and (iv) environmental (cost of nitrate pollution and cost of pesticide pollution). This Multi-Criteria Approach manifested that the micro-level sustainability shows wide degree of variation depending mainly on the personal characteristics of cultivator. The farms were classified into sustainable and unsustainable categories and input use across them was compared. Organic farms having larger operational area were showing higher level of sustainability. The increasing global concern over environmental protection and human health problems caused by agrochemical residues in food and environment and the resulting raise in demand for organically produced commodities assures brighter future for such systems. Despite rice cultivation being not profitable under the organic farming, the overall farming system is made highly profitable by including prawn cultivation in the succeeding season. A case-study is followed, examining the sustainability status of rice cultivation practices of Kaippad system of Kerala, where rice is grown in marshy lands and considerable share of cultivation practices are indigenous. Similar to the Pokkali farming, this system also depend fully on the organic farming measures. The case-study results also indicate that human resources, like information availability and education status of farmers, are the major determining factors of micro-level sustainability.

Keywords: India, Multi criteria approach, Organic farming, rice cultivation