



An assessment of energy use efficiency and sensitivity analysis of inputs in rice paddy production

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Abstract

This research studies the energy balance between the inputs and the output and estimation of inputs sensitivity for paddy production in Golestan province, Iran. The sensitivity of energy inputs was estimated using the marginal physical productivity (MPP) method and partial regression coefficients on rice yield. The results indicated that total energy inputs were found to be 29668 MJ ha⁻¹. The results showed that among energy inputs, the share of chemical fertilizers was highest with 39% followed by water for irrigation with 32%. Energy use efficiency and energy productivity were found to be 2.5 and 0.2 –kg MJ⁻¹, respectively. Sensitivity analysis indicates that highest MPP was for machinery energy, followed by human labour energy. The MPP estimated for biocides energy was found negative, indicating that biocides energy consumption is high in paddy production. It is suggested that specific policy is to be taken to increase yield by raising partial productivity of energy inputs without depending on mainly non-renewable energy sources such as chemical fertilizers and biocides that create environmental risk problems.

Keywords: Energy input, Sensitivity analysis, Chemical fertilizers, Paddy