Mapping of Physical Energy Consumption of Paddy Production System in Southern Sri Lanka

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Paddy cultivation utilizes a considerably higher amount of energy than other cultivations in Sri Lanka. Therefore, study about the energy usage in paddy farming system is essential for agricultural planning. The objective of the study was to estimate and map the physical energy requirement of paddy production in rain-fed and irrigated systems in the southern province of Sri Lanka. Primary data were obtained through a field survey and personal interviews using a structured questionnaire. The stratified random sampling technique was used to select the sample from each district. Secondary data and energy equivalents were obtained from available literature. Collected data were analyzed using SPSS 10 Version and mapped using Arc View GIS 3.2a software.

Physical energy requirement for Hambantota irrigated (HI), Matara irrigated (MI), Matara rain-fed (MR) and Galle rain-fed (GR) were ranged between 2.7-7.5, 0.76.1, 1.1-4.8 and 0.2-7.1 GJ ha-I respectively. There were significant differences in energy usage among selected categories except between MI and MR systems ($P<0.05$). The lowest physical energy requirement per kg of paddy was observed as 458.49 kJ kg-I in GR, and the energy requirement for HI, MI and MR were observed as 848.9, 668.8 and 859.7 kJ kg-I respectively. There were significant differences among systems except in HI and MR ($P<0.05$). The significantly highest energy output was observed as 79.33 GJ ha-I in HI. It was 56.90, 51.75 and 56.49 GJ ha-I for MI, MR and GR respectively.

Keywords: Energy ratio, Physical energy consumption, Energy output