

Greenhouse Gas Emission of Rice Production System in the Philippines Based on Life Cycle Inventory Analysis

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In the present study, we estimated Greenhouse Gas (GHG) emission from rice production system in the Philippines from seedbed preparation to harvesting and threshing based on national statistics 2006-2007. Since rice production area in the country is mostly dichotomized as irrigated or rainfed area cultivated twice a year, we used different emission factors of soil processes for each area. We included emissions from farming activities such as fertilizer, agricultural machine, and fuel as well as those from water buffalo (carabao) as draft animal widely used among Philippine rice farmers. Results showed that the total GHG emission of rice production in the Philippines was 13.3 Tg CO₂ eq. yr⁻¹, comprised of 3,920 kg CO₂ eq. ha⁻¹crop⁻¹ in irrigated area and 1,381 kg CO₂ eq. ha⁻¹crop⁻¹ in rainfed area. These corresponded to 0.93 kg CO₂ eq. kg grain⁻¹ and 0.47 kg CO₂ eq. kg grain⁻¹, respectively. A large proportion of the emission was derived from soil processes such as CH₄ and N₂O emissions from soil. Emission from carabao was 50 kg CO₂ eq. ha⁻¹ irrespective of water management. Emissions from fuel and other farming activities were 140 kg CO₂ eq. ha⁻¹crop⁻¹ in irrigated area and 111 kg CO₂ eq. ha⁻¹crop⁻¹ in rain-fed area.