

Assessment of Carbon Footprint of Upland Rice Production in Northern Thailand

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<https://doi.org/10.12982/CMUJNS.2020.0028>

Received: June 10, 2019

Revised: August 8, 2019

Accepted: September 2, 2019

ABSTRACT

Traditional slash-and-burn agriculture is practiced by the Lawa and the Karen in the highlands of Northern Thailand. The pattern involves planting upland rice for only one year and then leaving the land fallow for 6 years. This research aimed to assess the carbon footprints of upland rice production of this system by assessing the carbon footprint of land preparation and the life cycle greenhouse gas (GHG) emissions of upland brown rice production from seed planting to rice harvesting. It was found that carbon stock in the 6-year fallow forest was about 217.19-295.61 ton CO₂-eq/ha. The GHG emission in the land preparation of the Karen was 37.65 ton CO₂-eq/ha while for the Lawa, it was shown the GHG absorption was 16.79 ton CO₂-eq/ha. GHG emissions in the upland brown rice cultivation in the two tribes were 0.26 ton CO₂-eq/ha (0.13 kg CO₂-eq/kg unmilled rice) in the Karen and 0.37 ton CO₂-eq/ha (0.19 kg CO₂-eq/kg unmilled rice) in the Lawa. The tree cutting and slashing and biomass burning in the land preparation and chemical fertilizer production in cultivation produced the highest GHG emission from the upland rice production in the tradition slash-and-burn agriculture. However, this system was a carbon sink than a carbon source of about 233.61-257.70 ton CO₂-eq/ha.

Keywords: GHGs, Karen, Lawa