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Youth Community Resilience to Climate Change in the Mekong Delta (Y-CoRe)

Estimation of greenhouse gas emissions on the current status of organic rice cultivation – A case study in Vung Liem District, Vinh Long Province

Project background

Vinh Long province covers a natural area of 152,017.6 hectares, ranking 12th out of 13 provinces and cities in the Mekong Delta region (larger than Can Tho City). Agricultural land accounts for 118,918.5 hectares, or 78.23 per cent of the total area. Among this, land for annual crops covers 72,565.4 hectares, representing 47.73 per cent of the total natural area – of which rice land accounts for 71,069.2 hectares. This means that greenhouse gas (GHG) emissions from rice cultivation in the area are higher than those from other types of agricultural land use.

These emissions are a source of GHGs that contribute to climate change and affect the living environment of local communities. Therefore, economic development must go hand in hand with environmental protection, and reducing GHG emissions is an urgent matter. Estimating GHG emissions in current rice land use helps us better understand the amount of emissions released into the atmosphere during the rice cultivation process. This provides a basis for identifying emission reduction strategies and proposing appropriate land resource management measures.

Project objectives

The project aimed to estimate the volume of GHG emissions released into the environment from activities associated with organic rice farming at Tan Cooperative in Vung Liem District, Vinh Long

Province. The project calculated carbon emissions from different sources during the cultivation process to support the move toward sustainable farming.

PROJECT OVERVIEW

The study was conducted using the following methods:

- document collection and review regarding natural conditions, soil types, land use, and emission factors as published by governmental agencies
- field surveys and interviews with experts on organic rice cultivation techniques
- data synthesis and processing methods
- analytical and calculation methods using emission factors based on the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

OUTSTANDING OUTCOMES

Direct emissions from fuel use in farming activities:

During the rice cultivation process, machinery that consumes fuel causes direct emissions from three main activities: sowing, ploughing (which generates the highest emissions), and harvesting. For three organic rice crops over 30 hectares, approximately 3,810 litres of gasoline were consumed, resulting in an estimated total emission of 0.19 tonnes of CO_2-equivalent, accounting for about 1% of total emissions. These direct CO_2 emissions from the use of machinery are unavoidable. However, due to local farming practices, straw from the three harvests is typically sold or used to grow mushrooms, meaning that emissions from open burning of agricultural waste are negligible.

Indirect CH4 emissions from flooded rice cultivation:

Survey results show variation in cultivation duration and practices for the ST25 rice variety. The average cultivation period is approximately 115 days for the Winter-Spring crop and 110 days for the Summer-Autumn and Autumn-Winter crops. Indirect CH_4 emissions from these three organic rice crops amount to approximately 0.010856 Gg CH_4 per year, equivalent to around 271.58 tonnes of CO_2-equivalent annually, accounting for 99 per cent of total emissions.

According to calculations based on direct and indirect emissions using region-specific emission factors for 2022, 30 hectares of organic rice farming across three crops emit an estimated total of 271.60 tonnes of CO_2-equivalent per year. This translates to an average of approximately 9.05 tons of CO_2-equivalent per hectare per year.

Team member's information

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