

## ABSTRACT

Soil properties and soil carbon stocks are closely related to soil quality for sustainable food availability. Intensive tillage and fertilization can impact soil properties and soil carbon stocks. This study aims to determine the amount and distribution of soil carbon stocks and their relationship with soil physical and chemical properties that are indicators of fertility in irrigated rice fields. Sixteen soil samples (disturbed and undisturbed) were collected from each layer of four minipits. Each minipit consisted of four layers, where each layer had a thickness of 20 cm. The results showed that bulk density (BD) in irrigated paddy fields has a high criterion, the highest BD value was found at 800 m distance from secondary irrigation channel (d.s.i.c). The pH (H<sub>2</sub>O) value were acidic to slightly acidic, and the pH (KCl) value was neutral. The total-N content were varied from very low to low, very low total-N content was founded at 400 m.d.s.i.c. Average value of cation exchange capacity (CEC) were high at all minipits position. The amount of organic-C content were varied, from very low to high, the high content of organic-C was founded at 800 m.d.s.i.c. The amount of soil carbon stock around 49.82 to 85.89 tons/ha, the highest amount of soil carbon stock was found at minipits of 800 m.d.s.i.c. The cation exchange capacity drivers soil carbon stocks

**Keywords:** Soil organic carbon, paddy field, soil properties, layer thickness