# ABSTRACT

Carbon stoks play an important role overcoming global warming. The differences in soil characteristics, rice field types, and planting seasons can affect the availability of soil carbon and phosphorus stocks. The purpose of this research is to determine the relationship between physicochemical properties and soil carbon and phosphorus stocks. This research was conducted in three sub-districts, namely Lhoksukon, Banda Baro, and Syamtalira Aron. Sampling was done using purposive sampling and survey methods. soil samples were taken from 12 soil profiles and 36 soil samples were obtained. The results of the study showed that the highest sand content was found in the non-irrigated rice field type at 37.31%. The highest dust content was found in the non-irrigated rice field type at 37.53%. The highest clay content was found in the irrigated rice field type at 69.67%. The highest humidity was found in the irrigated and non-irrigated rice field types at 99 oC. The highest temperature was found in the non-irrigated rice field type at 34.9 oC. The highest bulk density was found in the irrigated rice field type at 1.66 g/cm3. The highest water content was found in the non-irrigated rice field type at 37.31%. The highest soil reaction was found in the irrigated rice field type at 6.36. The highest cation exchange capacity was found in the irrigated rice field type at 33.05 me/100g. The highest salinity was found in the irrigated rice field type at 4,47 dS/m. The highest organic carbon was found in the irrigated rice field type at 6.84%. The highest available P was found in irrigated rice fields at 5.03 ppm. The highest carbon stock was found in irrigated rice fields at 495.79 mg C/ha..The physico-chemical properties that affect carbon stocks are salinity, cation exchange capacity, C-organic, and available P. The physico-chemical properties that affect phosphorus are sand fraction, bulk density, salinity, cation exchange capacity, and C-organic.

Keywords: Soil organic carbon, paddy field types, rice planting seasons, soil characteristics