DETERMINING THE BEST AGRICULTURAL MANAGEMENT PRACTICES FOR SALT-AFFECTED COASTAL PADDY SOILS IN SRI LANKA CONSIDERING NET GREENHOUSE GAS EMISSION ALONG WITH OTHER SOCIOECONOMIC BENEFITS

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ABSTRACT

Sea level rise is a major impact of climate change. Sea level rise and various anthropogenic activities leading to salt water intrusion have affected law-laying agricultural areas. Salinity intrusion could significantly affect the food security. Rice is a stable food in Sri Lanka and occupying 1.05million ha of cultivated area. This study was initiated to assess best agricultural management practices for saltaffected soils considering net greenhouse gas emission along with other socioeconomic benefits. The research is being carried out in Madampe in Puttlam District (soil pH is 3-4 and EC- Sat. 2-4 dS/m) in Maha season. Newly improved salinity tolerance variety BG 310 was planted in this particular salinity effected geographical location to study the change in greenhouse gas emission. The following management options were applied in the different plots along with control plot; a) Broad casting seeds, addition of organic matter and maintaining the water level 2-3cm until milking stage. b) Transplanting of seedlings, addition of organic matter and maintaining the water level 2-3cm until milking stage. c) Transplanting of seedlings, addition of organic matter and intermittent irrigation. d) Control - Broad casting seeds, without addition of organic matter and intermittent irrigation. Greenhouse gases emitted from each plot at time intervals of 0 minute, 30 minute and 60 minute were collected using closed chambers at weekly intervals and analyzed by using gas chromatography (for N2O, CH4, and CO2). It has been noted that flooded (with an irrigation water level of 2-3cm) soil with high organic matter content has significant contribution to CH4 emission. N2O emission was observed in dried and re-wetted irrigated land plots.

Keywords: Sea Level Rise, Salinity Intrusion, Greenhouse Gas, Paddy, Management