

Greenhouses Gases Emission Mitigation from Rice Soil through Water Management

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Abstract—Paddy is mainly produced and consumed in Asian countries. More than 50% of population of Asian countries consumed rice as staple foods. Standing water is consider as most favorable environment for its higher production. Unfortunately, this standing water create anaerobic conditions which production the methane (CH₄). CH₄ is second most potent greenhouse gases and its global warming potential is 25 as compared to carbon di-oxide. Modern rice cultivar requirement huge amount of nitrogen for economically production. Urea is most commonly applied N fertilizer in paddy cultivation among the Asian countries. Unmanaged application of urea or other N based fertilizers contaminated atmosphere and hydrosphere component of environment. Nitrous oxide (N₂O) and nitrate are mainly contaminated in atmosphere and hydrosphere respectively by unmanaged application of N fertilizers. Emission of both (CH₄ and N₂O) the gases from paddy soilsenhanced greenhouse effect and thus results in global warming. The amount of N₂Oemitted as a result of rice cultivation is less as compared to CH₄; but the fact that global warming potential of nitrous oxide (298) is 11.92 times higher as compared to methane (25), makes it potent greenhouses gas. Two basic processes lying behind N₂Ogeneration from rice cultivation includede-nitrification (which occurs in anaerobic soil) and nitrification (that takes place in aerobic soil environment). Water management and optimum application of fertilizers may play significant role in reducing greenhouses gas emission from paddy.

Keywords: Paddy; Methane; Nitrous oxide, Water management.