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## Assessment of Methane Emissions and Growth Characteristics in Non-Puddled Transplanted Rice

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### [Introduction]

Methane has high GWP compared to carbon dioxide and methane occurred in paddy fields. Thus, cultivation technology is one of the most promising target for reducing GHG emissions. Non puddling is cultivation technology that irrigated a paddy after balance process without puddling. Also, non puddling promotes crop growth by inhibiting soil reduction, increasing root growth and promoting uptake nutrients. The aim of the present study was to assessment the non puddled transplant method whether the cultivation technology is suitable about carbon neutral in the future by comparing the methane emission and growth characteristics in non puddled transplanted rice.

### [Materials and Methods]

This study was conducted at the puddled and non puddled fields of the NICS. The methane fluxes was measured by closed chamber at two points per plot and analyses were conducted with gas chromatography. Gas sampling was conducted once a week during the rice-growing. In intermittent drainage period, gas sampling was conducted twice a week. During same period, soil redox potential(Eh), soil temperature and others was measured. Plant height and the number of tillers per hill were measured at tillering stage and heading stage.

### [Results and Discussion]

After supplementary irrigation water, Eh value of all plots changed from -444mV to 278mV because of turning to anaerobic environment. Methane emission was decreased in intermittent drainage period and directly after intermittent drainage period. The total methane emissions were highly lower in non puddled plot,  $47.9 \text{ mg m}^{-2} \text{ h}^{-1}$  in non puddled plot and  $95.8 \text{ mg m}^{-2} \text{ h}^{-1}$  in puddled plot. thus While, plant height and the number of tillers per hill were not differ all plots. the results showed that methane emission was reduced in Non puddled. These results suggested that non-puddled method promotes soil aggregation, supplying oxygen to the soil and minimizing the anaerobic environment.

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