



<b>Thesis Title</b>	Domestic Wastewater Treatment by a Free Water Surface Flow Constructed Wetland System Planted with Rice
<b>Author</b>	Miss.Wanida Duangjaisak
<b>Degree</b>	Master of Engineering (Environmental Engineering)
<b>Thesis Advisor</b>	Assoc. Prof.Dr. Suwasa Kantawanichkul

### ABSTRACT

The objective of this study was to investigate the removal efficiency of domestic wastewater by a surface flow constructed wetland system planted with rice (*Oryza sativa L.*). Four units of surface flow constructed wetland system made of brick lined with cement, 1.0 x 1.5 x 0.8 m<sup>3</sup> (w x L x h) were used. The units were filled with paddy soil to 0.4 m. deep. In the first experiment, the system was operated with intermittent feeding at hydraulic loading rates of 2 4 6 and 8cm/d. The maximum efficiency was obtained at the hydraulic loading rates of 2 cm/d. The treatment efficiencies decreased with increasing loading rates. The removal efficiencies of COD BOD TSS TS TP TKN and NH<sub>3</sub>-N were 49.1% 58.7% 64.0% 80.0% 68.8% 59.4% and 38.8%, respectively. In the second experiment, the system was operated by maintaining water level at 15 cm. deep and controlled hydraulic retention time at 10 15 20 and 25 day. The maximum efficiency was obtained at the hydraulic retention time of 25 day. The removal efficiencies increased with the increasing of hydraulic retention time. The removal of COD BOD TSS TS TP TKN NH<sub>3</sub>-N and Fecal Coliform Bateria were 92.5% 94.8% 90.7% 91.8% 88.0% 79.6% 90.0% and 99.2 %, respectively. This study reveals that domestic wastewater can be used for growing rice. Leachant form wastewater treatment, it can be replaced natural water during the dry season when there is a shortage of water. Therefore, the nutrients in the wastewater can substitute chemical fertilizer. The production of rice was about 0.46 kg/m<sup>2</sup> in the first experiment and 0.43 kg/m<sup>2</sup> in the second experiment which is a little less than the production form paddy field 0.5 kg/m<sup>2</sup>