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Evaluation of the Waste Water Treatment Efficiency from Small Scale Biogas Systems in the Mekong-delta

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Abstract

In the Mekong Delta waste water of households and farms is mainly discharged directly into the surface waters (fishponds and canals/rivers) which causes hygienic problems and may lead to fish death due to oxygen depletion. One kind of treatment waste water may get at the moment is anaerobic digestion at a few farms owning biogas systems. In this study these different small scale biogas digesters (10 concrete fixed-dome and 9 plastic tube systems, 5,7–8 m³) were examined and their efficiency to improve water quality was evaluated. Amount and concentration of waste water and hygienic parameters of in- and outflow was analysed (BOD₅, COD, N, P, E.coli, pH, EC, Redox, turbidity, suspended solids, Coliforms, Salmonellae, Helminth eggs,) and fluxes calculated. By passing the biogas digester several kg of solids are retained and thus water quality is improved in terms of turbidity but also other water quality parameters. Removal rates were higher in the concrete systems. BOD₅ concentrations were reduced to about half of their initial concentrations in average, but reduction rates differed in a wide range between the digesters. *E. coli* and Coliform were reduced by passing the biogas digester, the highest reductions being 3 log units (99.9%), resulting in *E. coli* concentrations from 9.0E+04 to 1.4E+08 MPN/100ml.

Waste water treated by anaerobic treatment in small scale systems does not match Vietnamese Water Quality standards (TCVN) but can be recommended as a suitable pretreatment, providing advantages compared to other pretreatments like septic tanks or settling ponds.

Keywords: Biogas, hygiene, Vietnam, waste water