Multi-Dimensional Assessment of Liquid Fertilizer Utilization of Methane Fermentation Digestion

—A Case Study in Jintan, Jiangusu in China—

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Summary

The purpose of this study is the multi-dimensional assessment of livestock waste utilization to methane fermentation digestion in paddy fields. This study is a case study of piggeries in Jintan, Jiangsu, China. We estimated this case study from resource, environmental, and economic aspects. These aspects are as follows; (1) We estimated the farmland area which the liquid fertilizer supplies for, (2) We measured the effect of reducing greenhouse gases (GHG) for climate change mitigation and, (3) We evaluated economic rationality for the sustainability of liquid fertilizer supply.

As for the results, (1) we focused on the six large-scale piggeries in Jintan. It was possible that all of the liquid fertilizer was able to be applied to paddy fields within a radius of 2,300m from each piggery. (2) At the A piggery, which is one of these piggeries, GHG reduction by the introduction of methane fermentation was 10,785t-CO_2eq/yr and the reduction rate was 64.8%. (3) Taking the break-even point into account, we revealed that the maximum economical farming scale was 39 % of the present scale in the case of the A piggery. When the owner kept the piggery scale more than 39%, it was necessary to make up for up to 1% of expense to liquid fertilizer supply from the hog raising business.

The introduction of such multi-dimensional assessment can contribute to the prior close inspection of the policy such as the promotion of biomass utilization and easing of global warming. In addition, it also contributes to the activities for these policies becoming sustained.

Keywords: livestock waste, methane fermentation, liquid manure, multi-dimensional assessment, sustainability, Clean Development Mechanism

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