

Roles and Perspectives of CDM in disseminating Biogas Micro Digesters to Chinese Farmers

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1. Background and purpose of the study

Biogas Micro Digester (BMD) is an equipment to produce biogas for kitchen use for small-scale livestock breeding farmers. The most important benefit for farmers is saving of fossil fuel purchase such as coal and coal briquettes. BMD also attracted lots of attention due to the effect to reduce CO₂ from fossil fuel combustion and CH₄ from open pit treatment of livestock manure. Although the Chinese government provides subsidy, current BMD diffusion rate is only 10~30%.

In 2007, Programme of Activities (PoA) was introduced as a new method of Clean Develop Mechanism (CDM). Since even small-scale CDM, which offers simplified procedures, had only a few projects of micro scale activities such as BMD installment, PoA was considered to enhance mass introduction of BMDs.

This study identifies barriers of BMD diffusion and examines the purpose of CDM in dissemination of BMDs from the viewpoints of farmers and CDM project developers. It further considers the advantage of PoA over small-scale CDM.

2. Method

5 documents of BMD introducing CDM Projects in China were reviewed. From the viewpoint of farmers, annual income of non-BMD users was compared with voluntary BMD owners and fossil fuel cost saving after BMD installation was calculated. For developers, CDM profitability was evaluated applying Internal Rate of Return (IRR) with sensitivity analysis for conditions of improving profitability. The advantage of PoA was analyzed by the profitability change after doubling the number of BMD installation.

3. Findings

The barriers of BMD dissemination are identified as insufficiency of the government subsidy and the lack of technical supports. BMD generates fossil fuel saving of around 350RMB/ household-year.

Advantages of CDM for farmers include diffusion to poorer farmers (income disparity was calculated as 1,760RMB compared with voluntary owners), increase of financial support by CDM to the regions excluded from government subsidy and enhancement of technical support.

Profitability for developers was different depending on the project. Projects with a small amount of credit and providing subsidy have less profitability. Reduction of fixed cost (initial cost) does not improve profitability, instead, 1) reduction of technical support cost, 2) increase of credit production and 3) increase of credit price were considered effective. Since credit sales profit does not recover the transaction cost, mass-introduction of BMD under PoA was not observed as an advantage over small-scale CDM.

4. Conclusion and future perspectives

This study suggested that CDM encourages farmers to introduce BMDs. In order to improve profitability, developers should pursue effective technical support without degrading its reliability and rigorous emission reduction estimation with flexibility to credit price change. Credit rating may be one option to produce high-value-added credits. PoA is a new system and thus requires a lot of improvement. Further simplification and cost reduction of procedures will enhance dissemination of BMDs.