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KNOWLEDGE CREATION AMONG LOCAL STAKEHOLDERS IN CDM WASTE COMPOSTING PROJECTS: A CASE STUDY FROM UGANDA

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SUMMARY: Clean Development Mechanism (CDM) is an opportunity to finance waste management infrastructure in low income countries. For Sub-Saharan African countries, composting is frequently suggested as a viable CDM waste management technology. However, the number of studies presenting existing CDM waste composting projects in Sub-Saharan Africa to learn from their experience is fairly small. This article partially fills this gap by investigating a CDM waste composting project implemented in 17 cities in Uganda. To do so, action research is applied in one of the cities (Busia), focusing on the existing knowledge and knowledge gaps among local stakeholders on the CDM composting project prior its implementation. Afterwards, ways of closing these knowledge gaps were elaborated. Results show that city authorities implementing and operating the CDM composting project, but also farmers as potential users of the compost are two relevant stakeholder groups. While a successful knowledge transfer resulted in composting technology not to be an obstacle to a sustainable implementation of the CDM composting project in this case study, the net costs and benefits associated to the project proved to be a big challenge for the participating cities. Lower tradable certified emission reductions than expected and the tardy payment of the regarding revenues were contradicted by higher operation costs and lower compost sale revenues than expected. A reason for the latter is the inexistence of a compost market, explainable by lack of experience and knowledge of farmers on compost. While this knowledge among farmers can be built-up, for instance by agricultural extension services, key factors for marketing the compost were appropriate compost prices based on the price for other fertilizers used, but also the quality of the compost, which should be not too dusty and free of potentially hazardous materials. Investigations like the one presented in the article at hand are important not only for future CDM composting projects in Sub-Saharan African countries, but also for designing green climate programs of greenhouse gas mitigation in the post-CDM period under the Paris

Agreement.

1. INTRODUCTION

Municipal solid waste (MSW) is a major challenge for urban regions in developing countries and its management requires good knowledge among local stakeholders. This also applies to



the Eastern-Ugandan Municipality of Busia.

Along with other towns in Uganda, Busia benefits from a CDM composting project, implemented by the Ugandan National Environment Management Authority (NEMA). Interviews with NEMA and field visits composting plants in operation shows that processing works quite well, but selling and marketing of the compost poses a challenge. This does not only affect the town's limited budgets, but also leads to an inefficient use of the compost as a valuable source of carbon and nutrients in agriculture. However, explanations therefore are not backed by any research. Thus, the research questions herein are on current farming practices in Busia, current organic fertilizing and soil conditioning practices, and the knowledge and concerns of farmers on organic waste and compost utilization.

2. MATERIALS AND METHODS

Initially, a survey among 120 farmers was made. In a second phase, action research was carried out together with 50 farmers divided in five groups and willing to voluntarily participate in the program. Qualitative interviews were carried out which each farmer, and demonstration fields for compost application identified by farmer groups. While these fields were under scientific guidance of Makerere University, each farmer received compost for his/her own garden without scientific guidance or training. Every two months, researchers and farmers met for knowledge exchange workshops. Finally, structured interviews with the farmers were made and additional data collected from farmers applying raw waste to their fields.

3. RESULTS AND DISCUSSION

Results show that the use of MSW on soils is quite common in Busia. Farmers are demanding for the unsorted wasted, paying around 5,000 UGX per ton $(2 - 3 \in)$, appreciating better yields and the low price, but are also concerned about waste fractions that impair them physically, like injection needles from health care waste and broken glasses. Concerns on non-degradables, like the impact of plastics on root penetration and water flow, are fairly small. Mineral fertilizers are seen as too expensive and unsuitable for the sandy soils, unlike organic manure fertilizers from animals, which are appreciated due to their price and longevity of fertilizing affect.





Figure 1. Problems faced by farmers when applying compost.

While farmers were familiar with the word "compost", the meaning was not to clear, and all interviews have not seen compost as delivered to them before. After applying the compost to their own fields and the harvesting at the demonstration garden, farmers judged the quality of the compost through the price they would be willing to pay, which lies between the local price for cow and poultry dung. Even though most farmers are willing to apply, they suggest to use smaller packaging (50 instead of 100 kg), but also the use of gloves for application, implying the presence of broken glass and injection needles in the compost.



Figure 2. Recommendations by farmers to other compost users and compost producers.



Figure 3. Price for organic fertilizers and willingness to pay for compost (3,000 UGX = 1 €)



4. CONCLUSIONS

The research has shown that farmers would be generally willing to apply and pay for compost provided to their fields. However, the price charged for the compost in the existing composting plants in Uganda is too high and should be reduced by the factor 3-4. More efforts should be taken on information, sensitization, and training, as compost is widely unknown in many parts of Uganda.

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REFERENCES

Lederer, J., Ongatai, A., Odeda, D., Rashid, H., Otim, S., & Nabaasa, M. (2015). The generation of stakeholder's knowledge for solid waste management planning through action research: A case study from Busia, Uganda. Habitat International, 50, 99-109.

Lederer, J., Ogwang, F., & Karungi, J. (2017). Knowledge identification and creation among local stakeholders in CDM waste composting projects: A case study from Uganda. Resources, Conservation and Recycling, 122, 339-352.