

Solid Waste Composting Financial Feasibility through Cash Flow Analysis - Case Study in Rabat Region, Morocco

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INTRODUCTION

As solid waste generation in developing countries keeps steadily increasing (Hoornweg et al, 2012), it becomes gradually more essential to adopt technologies that aim to reduce it. One way to reduce the amount of waste to be landfilled is by decomposing the organic portion to make compost which can then be used in agriculture, etc. The idea of reducing the volume of waste through composting is not new (Drechsel and Kunze, 2001). Nevertheless, African success stories are limited to small and often short-lived initiatives without any major impact on the municipal waste management (Furedy, 2002). In fact, previous composting experiences in Morocco revealed several problems arising from financial factors and affecting the feasibility of composting. Consequently, this research examines the financial feasibility of composting as a reduction scheme for solid waste from the composting plants' standpoint.

MATERIALS AND METHODS

The methodology for this research is based on a mathematical model that identifies and estimates the cash flow components for a composting plant. Each stakeholder (Figure 1) was assigned a component with a symbol in order to make equations for costs and monetary benefits (sales) of the composting process from the standpoint of a solid waste composting plant. A field visit and a questionnaire survey for farmers were conducted to examine the current situation in the area of Rabat. In addition, a cash flow analysis was performed with consideration of the material flow for the composting process. The developed model was used to assess its feasibility. This analysis took into account several costs borne by the composting plant such as: capital costs, operating costs, marketing costs and disposal fees of residue waste costs meanwhile the main benefit considered for the composting plant was quantified in solid waste compost sales (Figure 1 below).

RESULTS AND DISCUSSION

Cash flow analysis for composting plants

Compost sales and all the different costs related to composting from the standpoint of a compost manufacturing company were estimated. In Rabat area, composting costs were observed to be higher than the sales over the lifetime of the plant. This situation makes it very challenging from a financial feasibility standpoint with the current business model especially without any external subsidies or marketing efforts for the products. This particular aspect might explain why all of the composting plants in the study area stopped working within around 2 years and didn't last long enough to start making profit.

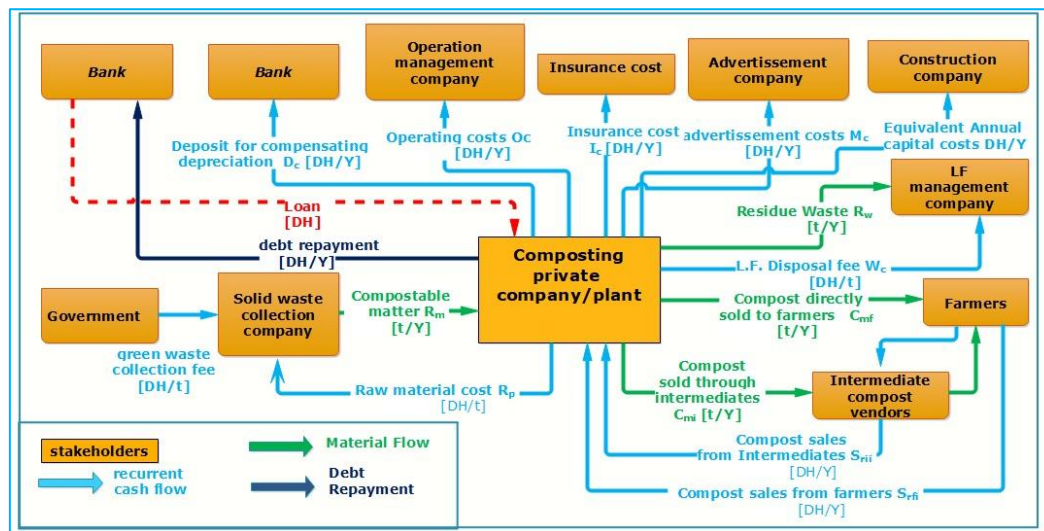


Figure 1 Cash and material flow of composting process of solid waste (source: the author)

Reasons behind the failure of composting in the study area

There were several composting experiences over the last few decades in the area but all of them ended up in failure. This failure might be explained by low willingness to use compost as most farmers expressed their unfamiliarity with the meaning of “compost” during the survey conducted in February 2019. Farmers who expressed unwillingness to use compost explained it by the effectiveness of their current agriculture practices thus they expressed their unnecessary to try new products at the moment. In addition, this result reflects the lack of advertisement for compost in the previous experience and confirms the weakness of composting industry in the region.

CONCLUSION

This study aimed to assess the Financial feasibility of composting through application of a cash flow analysis. The current situation with regards to the use of compost in the area of Rabat, Morocco was assessed. The outcome of this research shows that the composting industry in Rabat faces several challenges. These challenges are manifested in farmers’ unfamiliarity with compost as a product which translates to their low willingness to use it. In addition, the lack of advertisement for compost in the previous experiences also might be an important factor in the weakness of composting industry in the region. An additional inhibitor to this industry could be the absence of subsidies which contributes to the imbalance between benefits and costs. Potential solutions to this issue would be to reconsider the business model for composting plants to add other revenue streams other than compost sales for the composting plant. Furthermore, introducing ways to reduce initial costs such as subsidies could ease the initial cost benefit disparity and help promote composting to reduce landfilled waste and contribute even to agriculture.

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