

Original Research

Assessment on the Quality and Environmental Impacts of Composting at Institutional Community Using Life Cycle Assessment Approach

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Abstract

Composting is the commonly widespread treatment option in organic fraction of municipal solid waste and agro-industrial by-products. However some arguments have arisen over the years questioning its impact on the environment through gaseous emissions and impurities released from the system. Different composting methods reveal vital differences and the environmental impacts may vary. Hence, the study aims to assess the quality of the compost using passive-aerated static pile method in tropical climate and to study the associated environmental impacts. Data were obtained from an operating small-scaled composting facility corresponding to 1 kg of food waste as functional unit. The physicochemical properties of the final composts obtained indicate that they were stable and are according to the Malaysian standards. Seven impact categories were assessed and the characterized result showed that all sub systems contributed to all impact categories in different magnitudes. The study clearly resulted by treating food waste and yard waste, it could yield better greenhouse gas savings and providing valuable information contributing to effective climate change policy under Malaysia's settings. Thus, the diversion of FW to composting has considerable potential to result in a significant net climate benefit and offers great potential in establishing a circular food waste management system.

Keywords: food waste, composting, passive aerated static pile, GHG mitigation, environmental impacts