

ABSTRACT

Air and Water Pollution Assessment of Solid Waste Management System in Metro Manila

Key words: solid waste management, GHG emission, waste-to-energy, water emission, policy, life-cycle inventory, first-order decay method, Metro Manila

Management of solid waste has always been a problem in our society. With economic growth, lifestyle changes and population increase, challenges are expected to aggravate. The negative impacts related to solid waste management (SWM) can be considered as a local problem with global implication considering the resource, energy and greenhouse gas emission associated with it. This study aims to assess the challenges of SWM in Metro Manila, Philippines in terms of air and water emission. Abatement potentials are also identified and opportunities related to SWM as provided in the policies are laid down.

SWM is recognized as an important contributor to global warming due to methane (CH_4) emission from solid waste disposal sites. Through the first-order decay method, emission from the region's solid waste disposal sites was quantified. The resulting amount of CH_4 emission was used to estimate the potential of utilizing LFG (landfill gas) for energy. The estimate shows significant amount of energy that could be provided by LFG-to-energy instead of fossil fuel source.

Over all greenhouse gas (GHG) emission from SWM practice was also assessed through the life-cycle inventory. Among the SWM elements considered are collection, transportation and landfilling. The result affirms that CH_4 from landfilling has the greatest contribution to the SWM GHG emission. Although emission from the fuel consumption when collecting and transporting is very low as compared to landfilling emission, it is still important to address for environmental protection and economic benefits. As the scenarios suggest, emission could be reduced if the amount of waste to be transported will be reduced and if the LFG will be recovered and used for energy.

Aside from air emission, landfilling also contributes to water emission. High concentration of pollutants in the leachate poses danger to water security and safety. Countermeasures, therefore, should be in place to prevent tremendous damages which are irreversible.

In addressing issues related with SWM, policies are necessary drivers. The Philippines, like other countries, has legislated policies that advocate protection of the environment, human health and the society as a whole from the possible negative impacts of solid waste. However, gap does exist because of partial implementation of the law. Coordination of efforts in achieving the same objectives of different policies is also lacking. Stringent implementation of the law and concerted efforts from various stakeholders are therefore deemed indispensable to be able to achieve a sustainable SWM, thus contributing to the achievement of a sustainable society.

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