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**Techno-economic Assessment of Plastic Waste Management in Developing Countries:
A Case Study for Sri Lanka**

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Abstract

Worldwide, the plastic demand is increasing annually by 4%. Technologies can help save or reduce the material and energy consumption of the plastic material supply chain by applying proper waste management methods. However, comparative assessment is required to identify optimum material and energy recovery scenarios. Sri Lanka currently imports virgin plastic raw materials for different applications, which amounts to 300,000 tons per annum. Municipal solid waste generation of all solid waste is around 10,768 tons per day and collected by local authorities only 3,458 tons per day, in which over 50% of uncollected waste material, containing valuable plastics, goes to open dumps and the surrounding environment. At the end of life, plastic waste should not merely manage as energy recovery (such as waste to energy) however suitable technologies need to be applied to recycle the carbon for use as material feed stocks. Thermochemical and biochemical conversion technologies offer the option to utilize organic waste as chemical feedstock and subsequent polymers. The solution towards deriving synthetic materials allows a more closed cycle of materials and can help to reduce dependence on either fossil or bio-based raw materials. This study summarizes plastic waste management routes available and investigates how in the long-term they could be applied to enhance waste management in developing and emerging environments. Thus, the study aims to assess the technologies of plastic waste management in a Techno-economic framework in a typical developing country.

Keywords: Plastic waste management, Material and energy recovery, Circular economy

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