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Construction of material flow balance for crepe rubber manufacturing: Implications for cleaner production

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Material and energy flow information such as data on resource use and waste generation is particularly important to make sound environmental management decisions. The accounting for all water, materials and wastes flowing into and out of an organization is called a "material balance".

The present study intends therefore to construct a material flow balance for crepe rubber manufacturing industry in Sri Lanka. Therefore Millewa, Dartonfield and Kiriporuwa crepe rubber industries were selected for the study. For the construction of material balance, inputs and outputs of all necessary sub processes were considered and their weights and volumes were measured to the possible accuracy. The input-output analysis for each crepe rubber factory was conducted for two succeeding months where the initial latex crops were approximately similar to each other. Based on the values for a single production line, material flow balances were constructed for all three crepe rubber factories for one unit of output (one kilo gram of crepe rubber).

The results obtained in the material balance for all three factories were compared using different components of environmental performance indicators (EPIs) such as input material usage, volume of waste water discharge and energy usage. Based on their consumption pattern, different values were obtained by them. As an example, the annual waste water discharge per unit product was recorded as 31,744.74 *l* kg^{-1} , 18, 898.85 *l* kg^{-1} and 6865.67 *l* kg^{-1} for Millewa, Dartonfield and Kiriporuwa respectively.

Material usage data collected in the material balance provide an additional source of data, for tracking the physical material flow through the production line, which are usually unable to tract using the monetary information in conventional accounting system.

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