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Enhancing Value Chains by Applying Industrial Symbiosis Concept to the Rubber City in Kedah, Malaysia

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ABSTRACT

In the last decade, Malaysia has experienced exceptional growth, progressing from primarily agriculture-based to a more developed manufacturing-based industrial economy. The natural rubber industry has been an important sector for Malaysia’s economic development, contributing RM33.7 billion (USD101.1 billion) or 4.69% of the country’s Gross Domestic Profit (GDP) in 2013. This paper aims to apply the industrial symbiosis (IS) concept to the proposed Rubber City bilateral industrial development in Kedah, Malaysia. The concept of IS can be considered a strategic tool to enhance environmental and socio-economic sustainability of rubber industry. This paper involves stakeholder analysis of IS to identify strategic priorities and opportunities for the Rubber City initiative. The IS framework focuses on three main natural rubber downstream products: natural rubber blocks, tyres, and gloves; and identifies synergies in resource cycles and waste management using Materials Flow Analysis (MFA) and the Input-Output (IO) data based on previous Life Cycle Analysis (LCA) data for each of the three natural rubber products. Based on this case study, we identified ten principal synergies which include five potential IS industries integrated within the RC conceptual framework. Stakeholder surveys of natural rubber processors and other actors (such as government agencies) were conducted in Malaysia to identify barriers and enabling factors for IS implementation in the Rubber City. The outcomes of this study will be used as basis for integrated strategic development plan and implementation approach towards a sustainable Rubber City development in Malaysia.

Keywords: industrial symbiosis, natural rubber industry, sustainability, material flow analysis, input-output data, SWOT analysis

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