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**Life Cycle Assessment of Selected Wooden Products with Special Reference to Furniture Production in Different Scales**

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**Abstract**

A growing concern about the environmental effects of the production and use of goods, has led to increasing interest in wood-based products made in a sustainable manner. To understand the environmental impacts a product can cause the entire life cycle of the product must be examined, from raw material extraction through production, use, recycling and ultimate disposal. The furniture industry employs several raw materials including wood, metals, plastics, textile, leather or glass and impacts vary according to the materials. LCA is a multiphase process consisting of four interrelated steps: goal definition and scoping; life-cycle inventory (LCI); life-cycle impact assessment (LCIA); and interpretation.

The main objective of the study was to determine product impact on global warming potential of three furniture types and to compare the impact between three different production scales. A pretested questionnaire with details on production, raw material and energy usage was used to collect data from manufacturing units in Moratuwa and Galle area. Around 30 sawmills were surveyed from different scales. Global warming potential of a wooden settee, Almyrah and a Double bed was compared in three different scales of sawmills using Simapro software. The functional unit considered was 1m<sup>3</sup> of product. Product boundary was from gate to gate and there is no consideration on the transport and the usage of the product. Products is made of teak and mahogany timber. Greenhouse gas emissions from energy usage and wood waste during the entire life cycle are considered.

The total global warming potential is lowest in medium scale and in small scale it is two times higher and in large scale it is four times higher. The total global warming potential for almyrah is lowest in medium scale and two times higher in small scale and four times higher in large scale. For wooden settee it is lowest in medium scale and slightly high in small scale and four times higher in large scale. For the double bed it is lowest in medium scale and two times higher in small scale and five times higher in large scale. The usefulness of the results in minimizing the impacts from the industry is discussed.

**Keywords:** Product impact assessment, Wooden products, Life cycle analysis