

LIFE CYCLE ASSESSMENT OF LATEX HOUSEHOLD GLOVE MANUFACTURING INDUSTRY IN SRI LANKA

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Sri Lankan Rubber industry has nearly 500 years of history and it is one of the main foreign currency earners too. At present, Sri Lanka ranks among the top ten in the world and 7th largest exporter in natural rubber. The main rubber products manufactured locally are, Tyres, Gloves, Rubber Bands, Balloons, etc. Among them, the glove manufacturing for exporting is placed Sri Lanka as one of the top manufactures of the world and contributing more than 5% of global demand. The impact of the industry to the environment and to the society is significant today. All the stages of rubber processing from nursery management to end product transportation associate with harmful environmental discharges as toxic gas emissions, effluent water discharges and solid waste accumulation. With the increasing demand, the industry also scaled up gradually resulting more environmental discharges. Therefore, proper environmental management practiced needs to be implemented to sustain the industry. The objective of the research is to evaluate the environmental impacts through the life cycle of rubber glove manufacturing in Sri Lanka with special reference to the global issues such as, Soil Acidification, Water Eutrophication, Global Warming, etc.

The Life Cycle Assessment Methodology was used to conduct the research considering whole life cycle of Household Glove manufacturing from nursery management to end product transportation. First segment of the research was the manual calculation of the Global Warming Potential based on ISO 14040 standards and second segment was modeling the data in the software "SimaPro". The results of the manual calculation revealed that the Global Warming Potential of manufacturing one pair of Household glove manufactured is 52gCO₂eq. High electricity usage for the production is the major reason for that. "SimaPro" modeling interpreted that the most harmful fertilizers among the fertilizers used in rubber cultivation as Nitrogen based fertilizers; Phosphorous based fertilizers and Magnesium oxide. When consider the production stages of glove manufacturing the significant effect was the use of furnace oil for the boiler. Therefore the safe use of electricity for production, minimum use of the fertilizer according to the recommendation and minimization of furnace oil usage in production by shifting to biomass are the first and foremost implementations which can be done to convert the industry more greener in future.