

Product Carbon Footprint of a Garment Manufacturing in Sri Lanka.

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Apparel sector contributes for 5% of the total greenhouse gas (GHG) emission in the world. In Sri Lanka, apparel industry is one of the biggest industries which provide significant contribution to the growth of national economy. As denim production is a major subsector in this industry, estimating carbon footprint (CFP) of the pair of denim jeans is very much important. Therefore, main objective of this study is to assess the CFP of a branded pair of denim jeans manufactured in Sri Lanka for the export market. A process map was built considering on activities and processes that contribute to the life cycle of pair of denim jeans. The cradle to gate system boundary was defined to determine the product CFP. Activity data were collected from bills, data recording sheets, running charts and personal communication. Emission factors were obtained from the database of the Department for Environment, Food and Rural Affairs of United Kingdom (DEFRA). Calculation of CFP was done based on life cycle analysis under PAS 2050. Result showed that CFP of a pair of denim jeans is 18.41 kgCO₂e. According to the energy usage in stage of garment manufacturing, CFP for biomass, electricity and fuel were 9.42%, 4.32%, and 0.09% per product respectively. The highest carbon emission was recorded by fabric production (48.88%) while transportation (18.95%) and garment manufacturing process (16.41%) accounted for the second and third largest emissions. The lowest CFP in the production process showed for cotton production (15.75%). Finally, it can be concluded that there are provisions to reduce CFP of a pair of denim jeans manufactured in Sri Lanka using organic cotton, renewable energy sources and other environmentally friendly manufacturing methods. However, CFP of this product is comparatively lower than the estimates of other countries.

Keywords: Carbon footprint, Denim manufacturing, GHG, Sustainable production