

## **Life Cycle Assessment of Sri Lankan Chocolate Industry**

**N.D. Wickremasinghe and A. K. Kulatunga**

Dept. of Production Engineering

Faculty of Engineering

University of Peradeniya

Sri Lanka

nimdilon@gmail.com, aselakk@pdn.ac.lk

### **Abstract**

Cocoa is a minor export agricultural product in the current Sri Lankan market though it was a major one in the period of British rulers. But this is a most valuable export crop in agricultural field. Cocoa products are more attractive and customers are always willing to pay more for the best cocoa in the world. Considering the market value, the main important cocoa varieties are Criollo, forastero and Trinitario. There are lot of products that can be made from these cocoa species, few of them are Animal feed from cocoa husk, soft drinks and alcohol, Potash from cocoa pod husk, Jam and marmalade, Mulch, Cocoa butter for making chocolate, Cocoa powder, Cocoa liquor etc.. There are lots of products as mentions above in Sri Lankan market, chocolate represent a huge role among them. This paper is aimed at providing a comprehensive picture of the environmental impacts associated with Chocolate manufacturing and processing that is the main cocoa product in Sri Lanka by applying life cycle assessment (LCA) methodology. The analysis considered the entire system required to produce and process 1 kg of pure chocolate. It included the production of farming inputs in cocoa production (e.g. fertilizers and pesticides) and all agricultural operations in the field (e.g. tillage, fertilizer and pesticides application, harvest, etc.). Transportation of beans to processing factory and industrial processing of the beans into tasted chocolate were also included. The study was conducted in accordance with the international ISO procedural framework for performing LCA in the ISO 14040-14044 series. The overall environmental impacts resulting from Chocolate manufacturing and processing activities and improvement options towards the sustainability of the system studied are presented and discussed from the overall research.

### **Keywords**

Life Cycle analysis, export agriculture, Cocoa Chocolate Manufacturing, and environmental impacts.