

An AHP Based Methodology to Evaluate Social Life Cycle of an Apparel Manufacturing Plant

**M. I. Rashangani, H.M.M.M. Jayawickrama,
and A.K. Kulatunga**

Department of Production Engineering
University of Peradeniya
Sri Lanka

iresha.morawaka@gmail.com, malanj@pdn.ac.lk, aselakk@pdn.ac.lk

H.D.P. Premarathne

Department of Sociology,
University of Peradeniya,
Sri Lanka

pri.olinda10@gmail.com

Abstract

Social aspect plays a pivotal role in sustainable development. However, in the field of manufacturing there is a little attention has been paid to identify the socio-environmental impacts over the total life cycle of the products being manufactured. Further, there is a necessity of analyzing social life cycle especially in labour intensive industries. Moreover, as there are no well-defined approaches similar to Environmental Life Cycle Analysis (LCA) this methodology was developed limited to gate to gate phase of a manufacturing plant base on the guidelines specified by the UNEP guidelines for Social-LCA. The model expanded along the five main stakeholders; workers, consumers, local community, society and value chain actors. Sub-functions were identified along plant design, operation and administration. The model was validated through a study carried out in a medium scale apparel factory with different stratum of the different employee categories and diversities. Both qualitative and quantitative data were collected using interviewer administered questionnaire and observational guide. Conclusions were made using AHP method as the multi criteria decision making method. The results reveal that though this industry has fulfilled social responsibilities in to a minimum level, there are several areas to be improved. The majority of implementations are minimum requirements to be fulfilled under labour rules and factory ordinance. Further the results are optimistic in terms of worker satisfaction but a deeper investigation reveals that it is due to the lack of awareness of workers about labour rights.

Keywords (12 font)

Social life cycle, Apparel industry, Sustainability

Biography

M. I. Rashangani is a final year Production Engineering undergraduate at the Faculty of Engineering, University of Peradeniya.

H. M. M. M Jayawickrama is a research assistant in the Department of Production Engineering at the University of Peradeniya, Sri Lanka. He earned Bachelors in Production Engineering from University of Peradeniya, Sri Lanka in 2013. Soon after he joined to Department of Production Engineering at the University of Peradeniya as a temporary instructor. Currently he is following an MPhil degree in Manufacturing Engineering at University of Peradeniya. He has published 5 publications including a paper won the best track paper award in Lean and Six sigma track at IEOM 2014. His research interests include lean and sustainable manufacturing, Industrial Engineering. He is a member of the advisory committee of IEOM student chapter Sri Lanka.

A. K. Kulatunga is a senior lecturer in the Department of Production Engineering at the Faculty of Engineering, University of Peradeniya, Sri Lanka. He earned Bachelors in Production Engineering from University of Peradeniya, Sri Lanka and PhD in Mechanical/ Industrial Engineering from University of Technology, Sydney, Australia. He has published more than 50 books/book chapters, journal and conference papers. Dr. Kulatunga has carried out various research projects with local manufacturing and service sectors. He is currently serving as a co-drafter for organizational LCA, for UNEP/SETAC Life Cycle Initiative. His research interests include lean and sustainable manufacturing, Industrial Engineering. He is the country representative for IEOM in Sri Lanka. He also holds associate membership at IEEE, ERSCP, and IESL.

H.D.P. Premarathne is a lecturer in the Department of Sociology at the Faculty of Arts, University of Peradeniya, Sri Lanka. She earned Bachelor's in Sociology from University of Peradeniya, Sri Lanka and Postgraduate Diploma in Counseling and Psychosocial Work from University of Colombo, Sri Lanka. Currently, she is reading for MPhil at the University of Peradeniya, Sri Lanka. She has published over twenty publications in conferences, journal and book chapters. Her research interests include Industrial Sociology, Sociology of Health and Illness, Social Work and Gender studies.