

Constructing Lean- Green Productivity Index to Quantify the Environmental Impact for the Leaner Apparel industries in Sri Lanka

R.A.S.A Perera^{1*}, W.M.P.S.B. Wahala², and T.S.M. Amarasena³

¹*Faculty of Graduate Studies, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka*

²*Department of Tourism Management, Faculty of Management, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka*

³*Department of Decision Sciences, Faculty of Management Studies and Commerce University of Sri Jayewardenepura, Sri Lanka.*

*Shahein.aruna@gmail.com

Lean manufacturing is famous philosophy for waste reduction, and it generates significant benefits to achieve Sustainability. There is a less attention is drawn to measure the environment impact of Lean in practical scenario. This paper highlights constructing the metrics to measure the environmental savings from lean manufacturing in the apparel industry in Sri Lanka. The main objective of the study is “To quantify the impact of the lean manufacturing savings towards the environmental impact through the lean- environmental matrix based on Green productivity matrix?” the main objective is reached through four sub-objectives such as Objective 01 - “To Identify what variable has been the highest correlation among the variables of Lean manufacturing savings and Lean Manufacturing earnings with Product Life Cycle Cost in the operational activities in the apparel industry in SL?”. Objective 02- “To Identify how to develop the quantify coefficients for the environmental index in the apparel industry in Sri Lanka?” Objective 03- “To Identify what type of relationship prevails between Lean Productivity and the environmental index in the apparel industry in SL”. Objective 04- “To Identify what type of quantify relationship prevails between the Lean productivity index and the environmental index in the operational activities in the apparel industry in SL?” Secondary data from twenty-five apparel is considered for the sample of the study and Lean savings, Lean Manufacturing total earnings, Life Cycle cost, variables are considered as independent variables, and solid waste, toxic waste, Energy waste, water waste, and air pollution will be considered as dependent variables of the study. To reach the study objectives Multiple Regression analysis, regression analysis, and Correlation analysis, green productivity matric is expected to use as analytical tools of the study. This study will draw the attention of the apparel industries to consider greener in their production system in order to achieve sustainability.

Keywords: *Lean Manufacturing, Green Productivity, Environmental Impacts*