ABSTRACT

Garment industry has been facilitating to create a high quantum of wealth and employment in several countries. The raw materials of all types of garment products is cotton. A typical garment manufacturing process involves knitting, dyeing, compacting, cutting, stitching, printing, ironing and packing. Out of all these processes, while carrying out dyeing, large amount of water containing pollutants are ejected into the environment. Hence, there has been a high concern about the pollution caused by garment manufacturing companies. As a result, many governments of countries have been formulating and implementing laws to prevent the garment manufacturing companies from releasing polluted water into the environment. In this background, during the recent years, due to the insistence of the regulations and laws, garment manufacturing companies have been driven to implement green manufacturing principles.

Today, the garment manufacturing companies are facing tough competition in the market. This is due to the reason that a lot of players have entered into the markets. Hence, competitors are forcing each other to reduce the prize of the garments produced in garment manufacturing companies. In this situation, profit of producing garments is decreasing. In order to prevent the decreasing profit, garment manufacturing companies are driven to eliminate wastes while carrying out the production processes. The elimination of wastes is highly facilitated through the implementation of lean manufacturing paradigm. An overview in literature arena indicates that lean manufacturing paradigm is rarely implemented in garment manufacturing companies.

Today, in order to face the competition and adhere to pollution preventing stipulations, garment manufacturing companies are required to implement lean and green manufacturing principles. If these two principles are employed separately as programs in garment manufacturing companies, the cost of manufacturing the garments will increase. In order to overcome this

drawback, it is required to superimpose lean and green manufacturing principles. Quiet interestingly, one of the common goals of these principles is waste elimination. On sensing this commonality, a few lean and green integrated models have been contributed by the researchers. Such kind of models are suitable for application in specific industries. However, such kind of model suitable for implementation in garment industries is yet to be developed.

In order to bring out a lean and green integrated model which would be highly suitable for implementation in garment industry, while pursuing the research reported in this thesis, a model named as Green Through Lean Tools (GTLT) was designed. As the title implies, this model facilitates the implementation of green manufacturing through the adoption of lean tools. GTLT model has been designed to implement green manufacturing practices by applying three fundamental lean tools namely 5S, A3 report and *kaizen.* An unique feature of GTLT model is that it is incorporated with a measurement framework which enables to measure quantitatively and qualitatively the green manufacturing performance of the garment manufacturing company. After designing GTLT model, its effectiveness in enabling contemporary garment manufacturing companies towards implementing green manufacturing by applying these three fundamental lean tools was investigated in eight different types of garment manufacturing companies. The results of conducting these investigations and overall experience of conducting this doctoral work revealed that GTLT model can be vehicle for enabling the contemporary garment manufacturing companies to implement green manufacturing by applying the three fundamental lean tools namely 5S, A3 report and *kaizen* and enhance their profits.