



Research on the Development of a Sustainable Green Logistics System from the Perspective of Pakistan

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Abstract: Building a green logistics system is the inevitable direction of modern logistics development. There is no doubt that green logistics also have social and economical value but the ultimate goal is sustainable and environmental-friendly development and to reduce harmful effects of businesses on the environment. In the development of green logistics system need to consider green purchasing, green production, green transportation and distribution, green packaging and waste recycling. These are the mandatory requirement for the building of reliable green logistics system. In addition, we need to take appropriate measures to build scientific system for green logistics development.

Keywords: Sustainable Development, Green Logistics, Logistics System, Waste Recycling

1. Introduction

Green logistics is a process to protect environment and reduce to the harmful effect of businesses on the environment. The building green logistics including, green transportation, green distribution, packaging, etc. The ultimate goal of green logistics is sustainability and reduce to the emissions, negative effects of businesses on the environment; to achieve this goal is also in economic interest, social interest, and environmental benefits [1-2].

1.1. Social Value

Green logistics system will save the resources, and protect to the environment. The Green logistics' social value to the enterprises' performance can be identified in two different ways:

1. First, the green logistics business is a sustainable development. Second, the green logistics helps enterprises to build a good corporate image [3-6]. The good corporate image also become an competitive advantage for the firm and many

consumers buy products due to firms' positive image in their mind.

2. To gaining a public trust, green logistics firms get some environmental standard certifications, for example, ISO 14000 - environmental management system, etc.

1.2. Economic Value

Ecological economics, ecosystems have an economic value. There is a balance between ecosystems and economic systems. The system of green logistics for the economic value creation is reflected in three different ways:

1. First, the green logistics help enterprises to establish a good corporate image, which attract to shareholders, investors and customers.

2. Second, enterprises by using the economical use of resources, including transportation, storage, and material will help to reduce expenses.

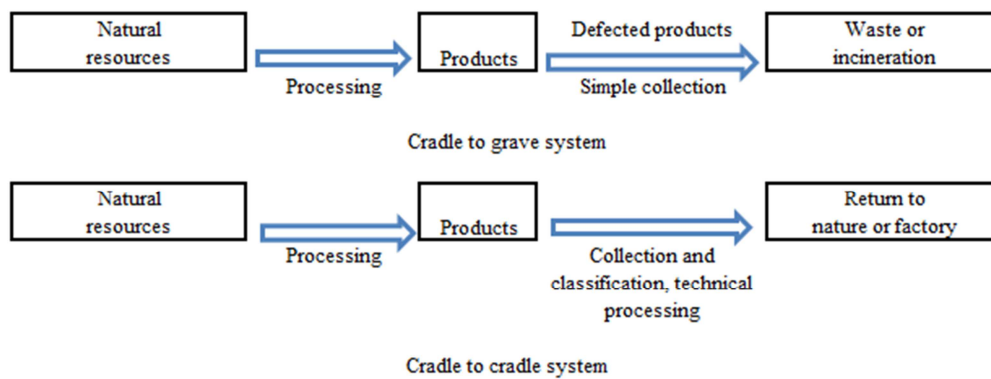


Figure 1. Industrial Model of “Cradle to Grave” and “Cradle to Cradle” System.

Third, reuse, recycling and other sustainable initiative plays a cornerstone to reduce raw material costs, and increase value for customers [4, 7-11]. Furthermore, cradle to cradle system is also helpful to develop green logistics system. In the Figure 1, natural resources used for manufacturing products and after the “PLC - Product Life Cycle” the products return to factory for reuse, re-manufacture, recycle etc. These are the complete process showing from natural resources to processing or manufacturing products till return to factory after the usage.

2. Effect of Logistics Activities on the Environment

Logistics as “goods receiving from suppliers to the process of physical movement”, in social and economic life is widely known as “third-party or third profit source” [9-13]. However, the development of logistics industry is also closely related to destruction of human living environment; its negative impact mainly as follows:

2.1. Transportation Impact

Unnecessary freight network layout and distribution centers, resulting in increased vehicle fuel consumption, traffic congestion, air pollution, and noise pollution, and marine pollution [10].

2.2. Warehousing Impact

Special treatment of some products/commodities will pollute the environment such as spraying, pesticides, etc. In addition, hazardous chemicals, flammable and explosive materials, due to improper storage, leakage, and explode also cause pollution and damage to the surrounding environment [12-16].

2.3. Handling Impact

Improper handling of materials or goods can damage the operation, resulting in waste of resources; and waste will also pollute the environment such as inadvertent leaking chemical can cause water and soil pollution [8-10].

3. Green Logistics Concept

The South East Asian logistics industry is still an immature; due to poor logistics infrastructure, compatibility, technology, etc. Therefore, we need to improved transport, packaging, distribution and other dimensions to build green logistics system. Researcher used a qualitative approach for thoroughly understanding the logistics problems, and conducted interviews with vice presidents of firm, Director and manager of logistics and supply chain. In this research, the green logistics problems and issues has been discussed from the perspective of Pakistan.

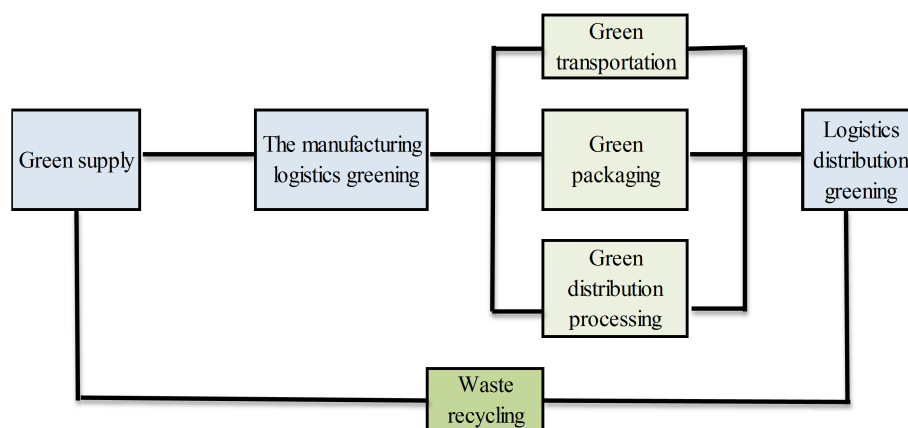


Figure 2. Green Logistics System.

3.1. Green Supply

Green supply logistics, due to different market condition are very important. In capital goods; cutting tight market conditions. Procurement personnel must do everything to find the information needed supplies. Under the conditions of oversupply, lowest costs and reduce inventory, to appropriate quality, and proper quantity, right time, right place, and right price for supplying production materials which are in need, helping the realization of enterprises' overall strategic objectives, to be the goal of supply logistics. Because the government is always strict with enterprise's environmental behaviors and the cost performance, and operational situation will influence enterprise's business activities. So in green supply-logistics, the environmental index of selection and evaluation of suppliers should be increased and the environmental performance of suppliers should be controlled.

3.2. The Manufacturing Logistics Greening

Greening producing logistics should be with material-supply as the starting point. The semi-finished goods after processing enter warehousing or continue to flow in accordance with the production technology and processes, until the finished goods being produced, and then being tested, classified, packaged, handling and other operational stages, finally entering finished goods warehouse. Manufacturing logistics mainly depends on manufacturing technology processes, the work-room, the configuration of warehouse related to the factory, and the processing line in work-room, the arrangement of operating points should start with shortening the distance between routines of producing logistics, and reducing operation time of handling, to promote the efficiency of producing logistics.

3.3. Green Transportation

The overall request of green logistics is: determine the flow direction and flow of goods correctly and plan transportation network and nodes properly, and develop division of

production and marketing balance and reasonable transport; select the best transportation type, and develop medium and short distance railway and highway division effectively; develop direct transportation and combined vehicle transportation; improve the efficiency of conveyance and promote the transportation ability; reduce inefficient transportation through distribution process; build comprehensive transportation system, develop special transportation technology and transportation tools, and enhance transportation monitoring.

3.4. Green Packaging

Green packaging is the mainly trend of packaging development in 21th century. Green packaging should reduce the application of packaging material as much as possible; packaging containers to be filled again and take that the whole or partial packaging after use should be recycled into consideration; the packaging material's recycled processing: recycle the packaging material after use, process and reprocess the material, which is used in different fields and degradation of packaging material.

3.5. Green Distribution Processing

Green distribution processing requests that setting distribution processing links, selecting processing places, processing type and the facilities should be considered comprehensively, to achieve the optimal allocation of distribution processing.

3.6. Logistics Distribution Greening

Greening distribution logistics is very important under the condition of modern buyer's market. Greening distribution logistics is not only the simple home delivery, achieving rationalizes the warehousing, classification, handling and transportation, but providing customers' ideal service and achieving the trust of clients.

3.7. Waste Recycling

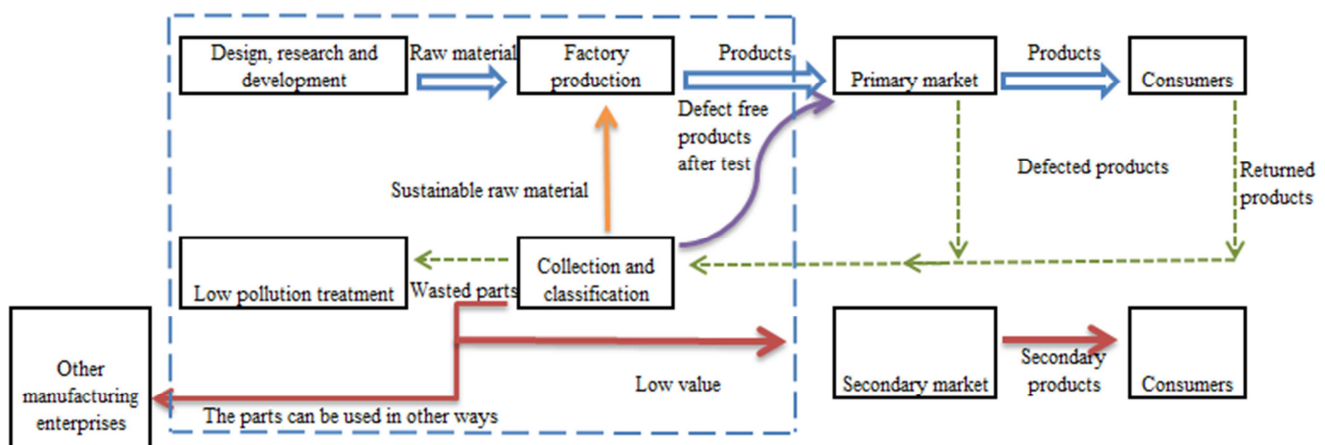


Figure 3. Green System for Electronics Product.

The environmental pollution caused by waste aroused wide concern of the government and society. From the perspective of green logistics. On the one hand, the overall arrangement of incoming materials and materials should be improved by manufacturers. On the other hand, in the product design phase, the availability and recycling performance of resource should be considered to reduce the production of waste materials. One example of “green system for electronics product” also mentioned in the Figure 3.

4. Conclusion and Recommendations

This research article presents a qualitative approach to conduct interviews with senior managers, directors of manufacturing firms to understanding the green logistics problems and issues from the perspective of Pakistan. The research findings show that firms cannot develop sustainable logistics without the involvement and support of all supply chain shareholders mainly top management, suppliers, government, consumers etc. These all supply chain entities provide a smooth environment for green logistics implementation and development. In addition, without green suppliers, implementation and development of a sustainable green logistics system is inefficient and not reliable. Regarding further research, there are multiple opportunities to extend the presented framework. Quantitative approaches can be used to further analyze the problems of green logistics through primary and/or secondary data and run the some statistical test including; SEM (structural equation modeling), MRA (multiple regression analysis). Future researchers can also analyze the problems with mix approaches (quantitative and qualitative) in same industry or other industries for comparison.

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