MARKET INSIGHT INTO CONTEMPORARY PRACTICES FOR GREEN SUPPLY CHAIN OF A LOGISTICS COMPANY IN PAKISTAN

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ABSTRACT

According to Patrick Penfield of the Whiteman School of Management, green supply chain management (GSCM) is utilizing beneficial inputs and converting them into outputs that may be recycled and recovered at the end of their useful lives. This study examines the GSCM procedures that DHL Pakistan has put in place, with an emphasis on proactive and reactive tactics and how they affect the logistics industry's economic, intangible, and environmental performance. The moderating role of the "Market" in this study is essential because it keeps the research useful and relevant by shedding light on industry changes, market dynamics, and environmental sustainability initiatives. This study's main focus is on the logistics sector's (DHL in particular) shift from traditional supply chain management to global supply chain management (GSCM). According to the study, improving commercial, economic, and environmental performance levels are only a few of the performance benefits that may be attained by efficiently coordinating internal and external GSCM processes. A thorough evaluation of all notable journals, books, research papers, and periodicals published between 2016 and 2020 was part of the research process. Using information from these sources, a quantitative study was performed with an emphasis on important GSCM projects carried out by different companies, as well as well-known writers. The goal of the data analysis was to pinpoint important suggestions and advantages of GSCM methods. Key findings suggest that performance advantages can be optimized by implementing GSCM approaches in a particular order. The results emphasize how crucial market factors are to improving GSCM techniques' efficacy in Pakistan's logistics industry. The study's result emphasizes the necessity of integrated GSCM procedures in order to attain long-term performance gains. The knowledge gathered from this study advances our comprehension of how logistics firms such as DHL may successfully make the shift to green supply chain management.

Keywords: Green Supply Chain Management (GSCM), DHL Pakistan, logistics performance, proactive and reactive strategies, supply chain integration, sustainability drivers, performance enhancement, organizational performance, industry transformation, Pakistan logistics sector

APPROVAL

This is to certify that this thesis conforms to acceptable standards of scholarly presentation and is fully adequate, in quality and scope, for the fulfilment of the requirements for the degree of Doctor of Philosophy

The student has been supervised by: **Assistant Prof Dr Dazmin bin Daud**

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DECLARATION

I hereby declare that the thesis submitted in fulfilment of the PhD degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part, for a degree at this or any other university. In making this declaration, I understand and acknowledge any breaches in this declaration constitute academic misconduct, which may result in my expulsion from the programme and/or exclusion from the award of the degree.

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(Abdullah Muhammad Khan)

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LIST OF ABBREVIATION

SCM	Supply Chain Management
GSCM	Green Supply Chain Management
ERM	Environmental Responsibility Manufacturing
DHL	Dalsey, Hillblom and Lynn
ST	System Theory
KBVT	Knowledge Based View Theory
IOT	Internet of Things

CHAPTER 1

INTRODUCTION

Increasing institutional and technological challenges have prompted businesses to focus more on greening their operations. Greening activities inside organizations must be matched with financial performance. Individual businesses have evolved from autonomous operations to integrated supply chain strategies while also becoming part of a vast network of businesses. There has been a progressive trend in these organizational connections toward increased collaboration and integration with supply chain partners. These supply chain and ecological considerations under green supply chain management (GSCM) have grown as an essential approach for industrial firms and their SCM to enhance their overall capabilities and competitive posture during the last couple of decades (Sarkis, 1995). However, there are substantial obstacles to overcome in the deploymentof GSCM. Multiple complexity and uncertainties, for example, are significant roadblocks for businesses seeking to use GSCM methods in their processes. The elements of effective Green Supply chain management that contributed to these complexities and uncertainty considerations include inter-Corporate and cross-functional convergence of environmental, manufacturing, engineering, marketing, and logistics workers and their concerns.

Co-ordination and collaboration of both inner, such as management support, and external Green Supply Chain Management practices, such as collaboration with suppliers and clients are essential for a manufacturing firm to harvest effective performance advantages from GSCM practice implementation. The financial and non-financial benefits of implementing GSCM principles include both financial and non-financial benefits. Due to problems in completely understanding and analyzing the numerous performance aspects, the range of performance results adds to the

complexity of the Green supply chain management adoption issue. The study's central argument is that coordinating internal and external GSCM practices1 is required to obtain numerous performance advantages across environmental, economic, and business results aspects.

Green supply chain management coordination is built on the adoption of techniquesin a certain order to accomplish the different performance advantages most efficiently. That is, incertain cases, successful adoption of internal GSCM practices is required before effective adoption of external Green supply chain management practices may be realized. This is the first research tolook at the impact of sequentially adopting GSCM methods on performance. Examining the intervention between Green supply chain management practices and their productivity consequences because of sequential adoption might give further insights into better managing Green supply chain management implementation challenges. The investigation has been done to the different mediation impact of internal and external Green supply chain management practice adoption and multiple dimensions of organizational performance gains to better understand the sequential adoption and coordination scenarios for implementing Green supply chain management.

As a result, examining the sequence of adoption and coordinating scenarios for environmental management strategies like GSCM becomes increasingly important from a managerial standpoint. By embracing a coordination theoretic approach in GSCM research, our study enhances the development of GSCM theory. According to coordination theory, greater performance results in the supply chain may be achieved by coordinating organizational activities such as internally and externally aspects of management practices. The influence of Green Supply Chain Management and regulatory policies on ecological, economic, and intangible performance is also

examined in this research, which uses company strategy as a control variable. Low-cost leadership, as well as quality and time-based strategy, areall aspects of corporate strategy that are examined. Internal (workers) and external (customers andsuppliers) stakeholders' perceptions are used to evaluate intangible performance. As a result, by including a diverse set of outcomes within the framework of business strategy, this studycontributes significantly to ongoing research that links green practices/regulatory practices to performance results. Furthermore, data was gathered from a developing nation that is expanding its worldwide economic footprint but has had little GSCM study done on it. (Senyo Kwasi, & Mensah,, 2020).

The demands of globalization and the evolving market conditions have drastically altered the role of logistic services in recent decades. Amidst a backdrop of growing intricacy (Hertz and Alfredsson, 2003), logistic firms may encounter rivals offering sophisticated services (Van Klink and Visser, 2004) intended for a eco-friendlier and competitive supply chain management (SCM). According to Sugiyama et al. (2008), "greenness" is an emerging concept in this context that has given rise to a variety of environmental problems, most of which are connected to the sustainability of logistical plans and operations. Green logistics is actually becoming more and more popular in academic discourse as well, yet because of its internal characteristics and relationship to contemporary. According to Gonzalez and Trujillo (2008), emerging technologies in logistics are a crucial component of supply chain management (SCM) since they may assist businesses in achieving competitive and environmentally friendly outcomes. Specifically, green technology can help combat global competition by lowering overall costs, improving supply chain management, lowering risks, and creating sustainable distribution networks (Gilman, 2003; De Martino and Morvillo, 2008). Additionally, these technologies may result in a tangible innovation in logistics

directed toward policies aimed at reducing environmental burdens; these policies may primarily address pollution, gas emissions, and the optimization of economic and material inputs (e.g., raw materials, clean and alternative energies, low-emission vehicles, etc.). In order to improve understanding of the strategies and policies intended to address the new problems in logistics sustainable development, this research attempts to provide a fresh viewpoint on the impact of green technologies and innovations on SCM (Zhu et al., 2012). The study also attempts to compare the findings from the literature review with the analysis of the DHL case study, which is conducted in accordance with Rao and Holt's (2005) conceptual model of green supply chain management's (GSCM) competitiveness and economic performance, in order to evaluate the impact of green technologies on SCM. (Srivastava, 2007).

Table 1.1: Green purchasing, packaging, and transportation benefits, and challenges

Green Activities	Benefits	Challenges	Authors
Purchasing	Lowers waste and liability costs. Enhances the company's "green" reputation.	High setup costs necessitate managerial support and corporate guidelines.	Karpak et al. (2001); Min and Galle (2001); Rao and Holt, 2005; Chen (2005); Larson (2011); Green et al. (2012
Packaging	Lowers the cost of packaging and solid waste.	High expense of employing substitute materials	Curty (2005); Rokka and Uusitalo (2008); Ouyang (2014)

	Increases environmental friendliness by using alternative materials and packing methods	and methods for packaging	
Transportation	Lowers operating costs and fuel usage. Lessens noise pollution, air pollution, and traffic congestion and enhances public and customer interactions	High cost of alternative fuel vehicles as an investment	Vannieuwenhuyse et al. (2003)

1.0 Background

Green supply chains are based on Webb's notion of green buying, which was initially suggested in 1994 for the Environmental Responsibility Manufacturing (ERM) research in 1996.

Green Supply Chain Management, as defined by Patrick Penfield of the Whiteman School of Management, is "the process of using environmentally friendly

inputs and transforming these inputs into outputs that can be reclaimed and re-used at the end of their life cycle, thus creating a sustainable supply chain." Toxic chemicals, inefficient packaging, and transportation techniques continue to be used by organizations throughout the world, resulting in clouds of gases that contribute to global warming. Every stage of the supply chain, from material procurement and manufacturing through packaging, transportation, and distribution, offers possibilities to decrease waste and pollution. GSCM methods have been shown in numerous studies to increase environmental performance, although the correlation is also dependent on organizational capabilities. There has been research into the links between GSCM (and other corporate environmental practices) and economic performance, but the results are mixed. Only a small amount of research has been done on the link between GSCM and operational performance. The lack of a clear link between GSCM adoption and increased performance, whether it's environmental, economic, or operational, has become a roadblock for manufacturing companies looking to justify GSCM adoption. Environmental protection and the purchase of green products are becoming increasingly popular around the world. The 2017 Earth Summit in Rio de Janeiro, Brazil, placed a strong emphasis on "sustainable economic development." To prevent the environment from being harmed, international corporations and governments from various countries came to an agreement and recognized the need for corrective action. When it comes to making economic development sustainable, carbon emissions are regarded as the single most important factor. In this setting, supply chain waste and emissions have emerged as one of the most significant sources of serious environmental issues. One of the most recent innovations in environmental preservation is the green supply chain (GSCM). It not only improves the organization's efficiency, but also its profitability. As a result, emerging countries like India have a

lot of room to implement GSCM practices and attain organizational excellence. From the conception and innovation of a product to its distribution and consumption, and finally to its recycling, GSCM should be ingrained in a company's DNA. Fig.1 shows the life cycle of the GSCM activity from the conceptual stage till the recycling of the product. (Chien, & M.-K. & Shih, , 2007).

Introduction to Sustainability and Green Supply Chain Management

The 21st century has seen an unparalleled worldwide emphasis on sustainability due to worries about environmental degradation, resource depletion, and climate change. Businesses are realizing more and more how important it is to integrate environmentally conscious practices into their operations since they are major contributors to these problems. Within this framework, the notion of Green Supply Chain Management (GSCM) has surfaced as a tactical methodology that incorporates ecological factors into every facet of the supply chain.

Given the larger backdrop, the logistics industry faces complex sustainability issues that are intricately linked to Pakistan's political, social, and environmental environments. The logistics industry is becoming more and more important as the nation's economy grows and industrializes, helping to connect different supply chain nodes and facilitate the flow of commodities. But this growth has serious negative effects on the environment, so it's important to fully comprehend the sustainability issues this industry faces.

The logistics industry in Pakistan faces significant issues, one of which is its enormous contribution to air pollution and carbon emissions. A significant amount of greenhouse gases are released into the environment during the transportation of commodities, which frequently depends on vehicles fueled by fossil fuels. An increase in vehicle traffic that follows the expansion of logistical operations to fulfill the

demands of a rising economy exacerbates air quality concerns in urban areas and along important transportation routes.

The logistics sector uses a lot of energy, especially electricity for processes related to warehousing and distribution and fuel for transportation. The energy consumption of the logistics sector becomes a key problem in Pakistan, where energy resources are not only limited but also confront challenges related to sustainability and reliability. It is essential to investigate alternative, renewable energy sources and increase energy efficiency in order to lessen the environmental impact of logistical operations.

Large volumes of trash are produced by logistics operations, including packing materials, outdated machinery, and non-recyclable items. Ineffective waste management techniques harm ecosystems, degrade the environment, and endanger public health in the long run. Furthermore, the logistics industry contributes to resource depletion because it frequently uses non-renewable resources for infrastructure related to packing and transportation. In order to solve these issues, adopting circular economy ideas and sustainable waste management techniques become crucial.

The growth of transportation infrastructure, including highways and storage facilities, may result in habitat disruption and deforestation. Threats to biodiversity arise from the logistics sector's intrusion into natural habitats as Pakistan grows to handle more trade and economic activities. It becomes a delicate task to strike a balance between the requirement for infrastructure development and the protection of natural ecosystems; this calls for strategic planning and sustainable land-use practices.

Although there may be environmental standards, it might be difficult to effectively implement and enforce them in the logistics industry. Ensuring compliance with environmental standards becomes crucial in the context of Pakistan, where

regulatory frameworks may still be developing or have enforcement shortages. In the logistics industry, the lack of strict regulations and oversight procedures could unintentionally promote unsustainable behaviours.

The intricate difficulty that Pakistan's logistics industry faces is probably striking a balance between environmental sustainability and economic growth. To promote trade and commerce, the country's developmental ambitions require a strong logistics infrastructure. The difficulty, though, is making sure that this expansion is accomplished without endangering the environment. Finding a balance between financial goals and environmental stewardship calls for creative thinking and a paradigm change in favor of sustainable business operations. (Zhu et al., 2007).

Pakistan's Economic Landscape and Environmental Concerns

Contextualizing the sustainability issues that Pakistan's logistics industry faces requires an understanding of the connection between the country's economic climate and environmental concerns.

Pakistan is a South Asian country that is rising quickly, and in the last few years, its economy has grown significantly. Increased trade, population growth, and industrialization are the main drivers of this expansion. Due to its advantageous location at the meeting point of the Middle East, Central Asia, and South Asia, the nation is now a major participant in regional trade. Diverse industries, such as manufacturing, agriculture, services, and the expanding information technology sector, define the economic landscape.

Building strong infrastructure is also necessary as Pakistan's economy grows, especially in the logistics industry. The transportation of commodities both domestically and internationally becomes essential to maintaining trade and economic expansion. In order to ensure the smooth movement of commodities, investments must

be made in transportation networks, which include ports, railroads, and roadways. Though necessary for economic growth, the quickening pace of infrastructure development also brings with it environmental problems like habitat damage, deforestation, and higher carbon emissions.

The population of Pakistan has been growing consistently, bringing with it both opportunities and challenges. The tendency of urbanization is noteworthy, as a considerable proportion of the population relocates to urban areas in pursuit of job and financial prospects. The logistics industry is under more pressure to deliver goods to urban centers in an efficient manner as a result of the growing demand for goods and services brought about by rapid urbanization. But growth also brings with it environmental problems, like waste production, contamination of the air and water, and the requirement for more infrastructure in cities.

Pakistan's energy industry faces difficulties with efficiency, sustainability, and dependability. The nation still mainly depends on fossil fuels, such as coal and natural gas, despite efforts to diversify the energy mix and include renewable sources. Carbon emissions and air pollution are caused by this dependence. Given that the logistics industry consumes a significant amount of energy, finding solutions to energy-related issues is essential for ensuring both environmental and economic sustainability.

In Pakistan, inadequate water resources are a serious environmental issue that is made worse by population increase, ineffective water management techniques, and climate change. Water shortages are especially dangerous for the nation's agricultural sector, which is essential to the economy. Transporting agricultural products from rural to urban regions is a function of the logistics industry, and the effect of water scarcity on agricultural output can have an indirect impact on food supply chains and logistical operations.