Green Supply Chain Management Practices in Developing Countries – A Case Study from Jordan

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***Abstract* - Purpose–Organizations worldwide adopt different Green Supply Chain Management (GSCM) practices in response to raising environmental concerns regarding pollution, climate change, natural resources depletion, and environmental degradation. Most of GSCM research has been conducted in developed countries; only few studies addressed developing countries. There is a dearth of research in the Middle East region, and even avoid of research in Jordan. Therefore, this paper aims to fill this gap by exploring the adoption of GSCM practices in the context of a developing country which is Jordan. Design/methodology/approach-A single case study is used to collect rich and in-depth information to explore the adoption of GSCM practices in developing countries. Data is collected through semi-structured interviews and documentation. Data is coded and analyzed using Nvivo 12. Findings -Using data from Jordan, this paper demonstrates that manufacturers in developing countries are showing interest and commitment towards protecting the environment despite the absence of governmental regulations by adopting a range of GSCM practices. Originality/value-The paper provides some insights on the adoption of GSCM practices in developing countries context.**

Keywords - GSCM, practices, developing countries, green, environmental.

I. INTRODUCTION

The vast industrial development and economic globalization have brought considerable environmental concerns over the last five decades such as; pollution, climate change, natural resources depletion, and environmental degradation. Environmental concerns started to appear in the 1960s and developed rapidly since 1990s to be a major pressure on organizations. Organizational responses to these concerns have grown beyond internal operations to cover the entire supply chain, and thus organizations at all levels of the supply chain are contemplating the adoption of different sustainable initiatives and practices. This has led to the development of the terms Sustainable Supply Chain Management (SSCM) and Green Supply Chain Management (GSCM). However, more emphasis has been paid on the environmental dimension, therefore GSCM has gained significant attention of both practitioners and researchers and has been a vital research stream in operations management.

The adoption of GSCM practices can assist organizations to reduce their environmental impact through reducing waste, conserving resources, minimizing energy and water usage, etc. Much has been written about the adoption of GSCM in developed countries such as; practices, drivers, effects on performance. However, less is known about the adoption of GSCM practices in developing countries. Investigating how GSCM is perceived in developing countries, what practices are being adopted will advance our understanding of GSCM, and give some insight about what is happening in these countries. The paper structure is as follows; section 2 provides a brief literature review about GSCM. Section 3 describes the methodology. Analysis and discussion are provided in section 4. Finally conclusion is discussed in section 5.

II. LITREATURE REVIEW

Environmental concerns have emerged as a vital consideration for business over the last two decades [1]. Initial responses to pressures on business to be more environmentally responsible in their production were targeted mainly at the internal operations level [2-3]. As environmental pressures have progressively increased, extension of environmental efforts to the SC level has become more prominent [4-6]. This has led to the development of the term GSCM which has its roots in both Environmental Management (EM) and Supply Chain Management (SCM) literature. Incorporating the 'green' concept into SCM involves addressing the impact and relationships between SCM and the natural environment [7].

Within the extant literature, there are no consensus definition for GSCM, but rather there are many definitions, nearly over 22 definitions [8-9]. The reasons behind the availability of various definitions are; first, GSCM is a cross-disciplinary field and researchers from different disciplines interpret the term GSCM differently and thus emphasize different issues in these definitions. Second, the boundaries of SC and what to be included in are not clear; however, the availability of clear boundaries are essential to identify spheres of influence, constraints and control. And third the field of GSCM is not mature and still evolving [9-11]. There are even many terms in the literature that have been used to refer to green supply chain such as; 'responsible supply chains', 'eco-supply chains', 'sustainable supply chains', 'closed-loop supply chains', 'eco-logistics', 'green logistics',

and 'reverse logistics'. These terms have been used interchangeably with the term GSCM [9].

The most cited definition of GSCM is offered by [7] which is "*integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life"* (p. 54-55). This definition was used by many other authors [12-16], since it highlights the different purposeful practices which organizations might adopt to incorporate environmental concerns throughout the entire supply chain with the aim of becoming a green supply chain. Despite the availability of many definitions for the term GCSM, there are some commonalities among them; for instance the environmental/green dimension is a common focus in all definitions [17-19], and the green focus is both internally and externally that involves all members of the supply chain, which means integrating the environmental dimension with the traditional supply chain [20-22]. Hence, the common understanding of GSCM is the integration of environmental concerns into SCM to improve the environmental impact of the supply chain and attaining economic performance and competitiveness [23-24]. GSCM encompasses a wide range of practices. Organizations all over the world are adopting different types of these practices. Several GSCM practices have been highlighted in research; such as, eco-design [25], internal environmental management, reverse logistics [26-27], supplier selection and assessment [28], supplier monitoring [5], supplier and customer collaboration [5, 29, 54], green purchasing [30], and much more.

The spectrum of GSCM practices is very broad, and the boundaries of GSCM practices are not set yet; as to what extent these practices cover the SC. Therefore, the literature on GSCM practices have expanded in various directions where researchers frequently examined single practice [31-32]. A consensus set of GSCM practices is yet to emerge, that combine all these practices together, rather than splitting these practices into distinct categorizes, because all GSCM practices complement each other and each practice is an integral fragment of the organization's overall environmental management [31]. Many categorizations for GSCM practices are available in the literature, for instance [33] grouped GSCM practices into three main categories: product recovery, reverse supply chains and collaborations, and green design. In the same vein, [14] classified GSCM into six main categories namely, reverse logistics greening, inbound greening, compliance greening, ecological greening, outbound greening, technology greening. Similarly, [28] grouped GSCM practices into three distinct categories, which are upstream practices, focal organization practices, and downstream practices. Likewise, [34] categorized GSCM practices into two groups; intra-organisational environmental practices, and inter-organisational environmental practices. However, most of the researchers such as; [20, 26, 35] follow the seminal work of [30] who classified GSCM practices into internal and external practices namely; internal environmental management, eco-design, green purchasing, cooperation with customers, and investment recovery. This classification emphasize the distinctive effects of internal and external environmental management [31, 36].

The adoption of GSCM practices differ among countries because environmental pressures differ among countries. Researchers argue that developed countries are more culturally and politically committed to protecting the natural environment, and have more comprehensive environmental regulations. Therefore organizations in developed countries are exposed to a higher degree of pressures compared to organizations in developing countries, due to strict environmental laws that control their environmental behaviours and outcomes, and increased stakeholders awareness and demands. This lack of complete environmental regulations, governmental commitment towards environment, and public awareness can explain why many organizations in developing countries are still having a reactive approach towards environment [2, 25].

The majority of the existing literature state that the adoption of GSCM practices improves organizational performance [25, 30, 36, 39, 40]. Therefore, the research question of primary interest in the literature is no longer 'does it pay to be green' or whether GSCM practices improve performance, but rather how to successfully adopt GSCM practices to attain desired performance outcomes. Currently, some researchers argue that compliance with environmental regulations is not adequate anymore and that adopting GSCM practices is no longer a choice but rather a must-have to compete in the business.

Research on GSCM in developed countries has progressed significantly than in developing countries. Most of GSCM studies has been conducted in developed countries; only few studies addressed developing countries [1, 37-39]. Developed countries have stricter environmental regulations and higher environmental awareness, therefore organizations in these countries are ahead of organizations in developing countries, they tend to have a more proactive towards the environment, and they implement various GSCM practices even beyond the regulatory requirements [39]. However, environmental pressures are becoming more immense and affecting not only developed but also developing countries, therefore developing countries started to establish some level of environmental regulations [39-40]. These regulations along with the global competition has exerted more and more pressures on organizations in developing countries to green their practices and to consider their impact on the natural environment [41]. Research on the GSCM in developing countries has mainly focused on few countries mainly China, India, and Malaysia [1, 38, 40, 42]. There have been many calls to fill this gap and investigate the adoption of GSCM practices in different geographical regions and different industries [43-44] in developing countries [45]. Previous research has mainly focused on the drivers for the adoption

of GSCM practices, and the relationship between the adoption of GCSM practices and performance.

There is a dearth of research in the Middle East region, and even avoid of research in Jordan. The Middle East region has traditionally played a key role in connecting Europe, Asia, and Africa. The importance of this diverse region has continued to grow and affect other major developed countries especially with the discovery and development of the oil industry [46]. Jordan is a small country with limited natural resources located at the heart of the Middle East region that is surrounded with turbulence and civil war. Jordan has also suffered from multiple refugee crisis. All of this have exerted immense pressures on the natural environment and raised many environmental concerns about the environmental situation in Jordan. Little is known about how manufacturers responded to these pressures and concerns, and whether they adopted any GSCM practices.

III. Methodology

Case study was selected for an in-depth exploration of GSCM practices adopted by a Jordanian manufacturer. Case study research has a strong history in the management field, and has been valued for its contribution in building knowledge about the reality of management practices. Case studies enables the generation of insight beyond the simplification created through theoretical concepts, enhancing the understanding of both what businesses are doing and why they are doing it [47]. Case study research can either use single or multiple cases. The use of both approaches is evident in the literature [48-49]. This paper is based on a single case study, and data is collected through semi structured interviews with the general manager and the environmental manger along with secondary documentation. Interview data was recorded, and transcribed. Afterwards, data was coded using Nvivo 12. A descriptive coding structure was created with the purpose of creating 'an inventory of topics' [50]. Then, a detailed descriptive analysis was created from the combined data sources.

IV. Analysis & Discussion

The case study named as Al-Quds paints is a private small-to-medium-sized business based in Amman, Jordan with 96 employees, and was established in 1994. It manufactures a variety of environmental-friendly products according to international standards mainly; water-based paints and specialty materials such as pastes, sprayers, tile adhesives, floors fixing materials, lamination paints, thermal and water insulation materials. Al-Quds paints exports to Oman, Kuwait, Iraq, Saudi Arabia, Qatar, United Arab Emirates, Palestine, Sudan, Libya, Syria, Lebanon, and Egypt, in addition to the Jordanian market [51], and aims to introduce its products to every house in Jordan and expand its markets in Asia, North Africa and Europe to attain the greatest return to the investors, employees, customers and the environment simultaneously.

"*Our vision evolves around being a leading and distinctive model in manufacturing paints and construction materials inside and outside Jordan, to provide environmental-friendly products and introduce them to every house while committed to high quality and reasonable prices"* [52].

Al-Quds paints has been awarded with many environmental and quality certification such as; ISO 14001 in 2009, ISO 9001 in 2009, and others as listed in Table 1.

Al-Quds paints has taken the responsibility of minimizing the environmental impact of their internal processes and producing environmental-friendly paints and products, since establishment, which is stemmed from their environmental policy of protecting the environment whenever possible. However, their efforts towards protecting the environment were fostered after attaining ISO 14001 in 2009, and therefore in 2010 they set up a plan to adopt a range of GSCM practices.

"*The concept of environmental-friendliness has been present in the organization since its inception and was initially aimed at producing environmental-friendly paints and products…. obtaining the ISO 14001 certification in 2009 reinforced our environmental thinking and prompted us to disseminate this idea and incorporate it throughout our supply chain. So in 2010 we developed a ten-year work plan to adopt GSCM practices"* [52].

The adoption of GSCM practices in Al-Quds paints was voluntary in the absence of governmental laws that control this industry. Indeed, the organization has shown a proactive environmental approach, and commitment towards building-up environmental regulations to govern the paint industry, and increasing customers' environmental awareness,

"*The organization's approach to adopt GSCM practices was voluntarily and self-reliant, without any outside pressures or laws and regulations […] except the laws that specifies disposal methods of production waste […] Since two years, we have been working with the Ministry of Environment, the Ministry of Industry and several government agencies to develop strict environmental laws to control the paint industry due to the danger of VOC's which are still used in some factories and which adversely affect the environment and the health of each person in contact with this paint […]*

We seek to increase the environmental awareness of customers, and advise them to think about the quality of paint used in their homes, what is it made from? What are effects of paint on health? What are the effects of paint on the environment?" [52].

The organization's understanding of GSCM as a comprehensive concept, was reflected on the range of practices they adopted,

"*Integrate the environmental thinking into the entire supply chain process, including raw materials selection, product design, manufacturing processes, final product*

delivery and even product end of life. It is a continuous process to reduce and limit the negative impact on the environment resulting from the manufacturing and distribution of the products" [52]

"The organization's strategy towards the environment is a comprehensive strategy" [53]

Stemming from this understanding, Al-Quds adopted several GSCM practices at both internal and external level. On the internal level the organization adopt EMS, green production, waste management, and cleaner energy. On the supplier-side the organization adopt green supplier selection, supplier monitoring and evaluation, and green cooperation with suppliers. Finally, on the customer-side the organization adopt continuous cooperation with customers, and green transportation. Table 2 provides a description of GSCM Practices in Al-Quds Paints.

The selection of these practices was based on the organization's environmental policy, environmental goals and objectives, in addition to the organization's available resources.

"Selecting GSCM practices to be adopted depends on the organization's environmental policy, environmental goals and objectives, in addition to the organization's resources. Considering the organization's early goals of producing environmental-friendly paints, the focus and priority was for the EMS and green production, and then we started to adopt other practices to include several stages in the supply chain […] We are constantly striving to adopt and implement any practice that will protect the environment and reduce the negative impact on the environment resulting from the supply chain wherever possible and whenever possible, and in light of our potential" [53].

V. Conclusion

The results indicate that manufacturers in Jordan are showing interest and commitment towards protecting the environment despite the absence of governmental regulations by adopting a range of GSCM practices, which demonstrates a proactive approach. The adoption of GSCM practices starts at the internal level such as; EMS, green production, waste management, and clean energy. Afterwards, GSCM practices on the supplier and customer side are adopted such as; green supplier selection, supplier monitoring and evaluation, green collaboration with suppliers, continuous cooperation with customer, and green transportation.

Limitation and Future work: One limitation of this paper is the use of single case study. It is important for further research to consider the use of multiple cases from different Jordanian manufacturers to allow generalization of findings, and the consideration of other geographical regions in developing countries.

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TABLE 1 ENVIRONMENTAL AND QUALITY CERTIFICATIONS OF AL-QUDS PAINTS.

Category	Certification	Description	Reference
Environmental	"ECO Smart" label	Ensures the production of environmental-friendly paints with low odor, low emissions, and easy to use, using "Vinyl Acetate Ethylene Technology", without the use of volatile or semi-volatile organic compounds (VOC's).	51-52
	"TUV SUD" label (low emissions pollutant tested and product monitored)	Ensures that products comply with the specifications of ISO 16000/9 and EN 13300, and guarantees low concentration VOC's in the paint can to less than 0.5 g/l, and low emissions of VOC's after 72 hours of application on walls to less than 300 mg/m^3, and limits the presence of heavy metals such as lead, mercury, and zinc.	51-53
Quality	CE Mark (EN-12004)	Ensures the quality of tile adhesives	51-52
	CE Mark (EN-13888)	Ensures the quality of tiles cement based adhesives	51-52
	CE Mark (EN-13300)	Ensures the quality of water coatings	51-52

TABLE 2 GSCM PRACTICES IN AL-QUDS PAINTS.

Category	Practice	Description
Internal GSCM Practices	Environmental Management System (EMS)	*"Integrated administrative system to manage, control and monitor all environmental issues related to the organization's activities and operations such as pollution, waste management, resource utilization, water and wastewater management"* [53]
	Green Production	*"Design and manufacture environmental-friendly products according to the highest European and international standards [...] This includes green products …. green production processes […] green use"* [53]
	Waste Management	*"Manage and dispose waste through collection, transfer and treatment, while recycling and reusing when possible or safe disposal within the legal and regulatory framework related to waste management"* [53]
	Clean Energy	*"Reduce the negative impact on the environment, associated with the use of traditional energy sources, through the use of special filters to reduce emissions …. rationalize electricity consumption where possible, while continuing to work and communicate with several government agencies to facilitate the licensing of solar panels"* [53]
Supplier-Side Practices	Green Supplier Selection	*"Select suppliers on an environmental basis of their commitment and compliance with environmental standards and specifications"* [52]
	Supplier Monitoring and Evaluation	*"Monitor and evaluate the performance of its suppliers to ensure that all raw materials meet the environmental specifications and standards agreed upon in the contracts each time"* [53]
	Green Collaboration with Supplier	*"Cooperation with suppliers to reduce packaging while working to guide suppliers to use environmental-friendly packaging materials, or self-degradable materials"* [53]
Customer-Side Practices	Continuous Cooperation with Customer	*"Developing the relationship with customers to promote the development of green products in addition to exchanging information to spread the concept of environmental friendliness and increase environmental awareness among customers in general and regarding paints in particular"* [53]
	Green Transportation	"*Reducing the pollution resulting from transporting products taking into account the environmental conditions and specifications of dealing with materials, especially when exporting abroad by land"* [53]