DEVELOPING INTEGRATED GREEN SUPPLY CHAIN DRIVERS AND BARRIERS FRAMEWORK FOR GREEN SUPPLY CHAIN ADOPTION, MENA REGION

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Recently, corporate environmental practice such as Green Supply Chain Management (GSCM) and green innovation appears as a novel organized environmental practice for manufacturing companies to handle the increasing environmental issues. The aim of this paper is to assess the level of adoption of GSCM and green practices through proposing framework. A total of 123 responses from industrial sector of the Middle East companies were collected from mail questionnaire. The results showed industrial sector of the Middle East manufacturing companies are in trial adoption stage for both GSCM practices. Internal environmental management practice of GSCM practices are relatively high adopted in industrial sector. Meanwhile, most of all green innovation practices are heavily implemented in MENA region companies. This paper empirically attempts to provide understanding and new insights for sustainability management area where GSCM and green innovation practices are important to improve organizational environmental performance, which can directly offer great benefits for both researchers and practitioners.

Keywords: Green Supply Chain Management (GSCM), green practices, organizational environmental performance, barriers, drivers.

INTRODUCTION

The integration of environmental concerns and organizational performance started gaining attention over the recent decades. Greening the supply chain becomes authoritative command in developed countries but most of Middle East countries do not adopt the idea of greening the supply chain. Green supply chain is a concept that combines green procurement, environmental management of manufacturing materials, environmental circulation (i.e. any external change for the company), marketing, and reverse logistics.

As Kawasaki *et al*. (2012) is one of the researchers of the MENA region (including the Middle East and North Africa regions) residents and is involved in the logistics sector through the work field, an analysis of the situation of the green supply chain management process in the MENA region was introduced. Besides, the enablers and drivers of the green supply chain management process are observed and an evidence was presented for the applicable enablers and drivers. MENA is an abbreviation used for the region of Middle East and North Africa. The countries of the MENA region are located geographically on two continents, Asia and Africa. The Arabic language is the most common spoken language in the region except for Iran, Turkey, and Israel. Middle East and North Africa (MENA) region are characterized by absence of a vibrant private sector, poor trade performance, social and political instability, GDP positive but volatile, scarcity of water resources, agriculture is not a dominant economic activity in most countries (O'Sullivan *et al*., 2011). Economic development has been widely affected by these factors.

The researcher chooses this region as it has its own nature. The MENA region is well known with its oil resources and large size of population that make the human resources available in the region. Despite the presence of such resources, the countries

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of the MENA region are not well utilizing such resources in their industries and they are misusing these resources in several ways that make the region not adopting green processes. Therefore, the purpose of this study is to explore the green supply chain management process drivers and barriers within the context of the industrial sector of the Middle East. It also develops a framework for the green supply chain management process that relates the supplier with the firm practices according to the existing market pressure, which may lead to specific supply chain management practices.

LITERATURE

Supply Chain Management Process

Numerous definitions were given to the supply chain. Supply chain is the management of flow of goods and services that transformed raw material to final goods and it is the achievement for economic, social, environmental aims for institutions to develop the economic performance for any company in long term being and its supply chain (Carter and Rogers, 2008). Furthermore, it is an active process that contains of materials, funds and information and their continuous movement among a number of functional areas within and between chain members (Ahi and Searcy, 2012). Sustainable Supply Chain Management (SSCM) can be identified as the construction of optional and volitional collaboration and integration of supply chains partners and parties by all means and aspects such as: environmental, economic and social. All of those considerations should work with the main aspect and key of an inter-organizational business system. Supply chain is considered with the product process that is starting from the initial processing of raw materials till delivery to the end-user. Thus, achieving development of sustainability requires a solid step towards adopting supply chain management system (Ahi and Searcy, 2012).

Integrated Green Supply Chain Management Process

GSCM is important for raising the awareness of the environment in the last few decades. Many organizations reacted to green issues by directing green principles to their companies like using environmentally friendly raw materials, reducing the usage of petroleum power in addition to using recycled papers for packaging, and recycling of electronic wastes. Because of strategic driving forces and pressures from different stakeholders, firms are embracing green supply chain management (GSCM) practices to spread out environmental sustainability objectives to suppliers (Laari *et al*., 2017). The green supply chain conceptually covers the whole process from having the raw materials that consists of less environmental harmful factors till the finished product; each supply chain consists of many separate companies, and they are linked by the role of each company in achieving the needs of the consumer, and through this process supply chain also includes transports, warehouses, retailers and the customers themselves. There is an impact from the suppliers, customers and management through the supply chain as to make the expansion more sustainable for the future cooperation. Some firms being driven by their top management and others are being driven by external influences, like stakeholder stress or customers' demands, so here organizations could suffer from barriers and drivers to application of sustainable supply chain management.

Full supply chain integration means much more than simply managing the movement of materials and resources and addressing logistical issues thereof. Rather, supply chain integration means an acknowledgement that production stages of the supply chain must exchange data, and analytics and time-sensitive information in real-time with other points in the supply network. Full supply chain integration means much

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Green Supply Chain Management Process Application in the Industrial Sector

It was found by several studies that linked between the environmental practices which is related to GSCM are industrial ecology, industrial symbiosis. In addition, it was found that eco-design, life cycle analysis, product stewardship, extended producer responsibility, and environmental management systems (EMS) are much related to the common environmental policies and procedures of GSCM. All these practices targets removing and alleviating the environmental effects of organization procedures on the environment. According to (Oyo *et al*., 2014) Study, the idea of cost reduction to assist and one of aims that is created by the development of co-operative and integration between suppliers and encouraging life-cycle is considered one of the critical and core aspects that drive individual firm for applying GSCM. Although the importance and requirement for environmental awareness, there is a slow enactment of GSCM between intuitions and transform this awareness into practice in the Chinese manufacturing industry. GSCM has performed various studies especially in the industrial sector. One of the studies discovered that there are many organizations are practicing internal environment management and resource recovery. However, they are not that active with green supply chain in total. Suppliers' assessment is a critical function within supply chain management. Green supplier assessment is also necessary for sustainable supply chain management. Supplier assessment is considered as not just supplier selection but other phases of evaluation and aspects of management. It refers to the process of evaluating and approving potential suppliers by qualitative and quantitative assessment.

The purpose is to ensure a portfolio of best in class suppliers is available for use. It is also applied to current suppliers to assess their performance for the purposes of decreasing costs and risks, increasing quality and driving continuous improvement.

Green Supply Chain Management Process in a Developing Country and Middle East

Kappa (2013) study that is an empirical study in Pakistan for investigation the performance of GSCM and its network has been undertaken. It found that there are links (leadership, institutional pressure, internal green practices, external green collaboration and green and economic performance in GSCM network) that are needed for examining the relationship between GSCM and its impacts on the economic and green performance of developing countries. GSCM is being recognizably practiced in large organizations more than small organizations. Therefore, large companies are considered a diffusion mechanism to help collaborations with other countries to adopt GSCM. For instance, in India 80% of the manufacturing is a collaboration between small and medium organizations and large organizations. One of the recent studies on Middle East is the one applied by Younis *et al*. (2016) study that adopted green supply chain management (GSCM) practices was achieved and its impacts on corporate performance (CP). This study implemented consequences of applying GSCM practices on dimensions of the CP. Younis *et al*., (2016) study integrated research model to examine the relation between the four dimensions of GSCM (eco-design, green purchasing, environmental cooperation and reverse logistics) on four dimensions of CP (operational performance, environmental performance, social performance and environmental performance) with controlling firm size, firm age and environment management system certification. Younis *et al*. (2016) study depended on collecting data from 117 industrial companies in United Arab Emirates (UAE) through questionnaires and analyzed these data. The results of Younis *et al*. (2016) study found that GSCM practice had impact on

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CP dimensions but, the four GSCM practices had no impact on the dimensions of the CP which are environmental performance, green purchasing and environmental cooperation were found to have a significant impact on the operational performance.

Barriers and Enablers to Green Supply Chain Management Process

One of the main and important enhancement of the organizational philosophy is green supply chain management as it is used as one of tool that helps in diminishing the environmental risk. Legislations and environmental regulations, the competitors' pressures', meeting the demand of the global market, which required high level of environmental adoption among their imported products and one of leading drivers that enforce organizations to execute and implement GSCM is the raise of awareness of consumers toward green products. Finally, it could be stated that all of these drivers are the main elements that are leading organizations to implement GSCM (Zhu and Geng, 2013). Barriers in GSCM must be deflected to accomplish an environmentally sound supply chain in construction despite of the existence of public awareness, absence of learning about natural effects notwithstanding, poor duty by top administration and absence of legitimate implementation by the legislature, while absence of resources, absence of maintainable practices in the association's vision and mission. In addition to, absence of market for recyclable materials, absence of data sharing between construction firms and suppliers and absence of interest were additionally distinguished as barriers. Accordingly, implementation of GSCM plays vital role in organizations at both environmental and organizational levels (Gandhi *et al*., 2015). This framework below which is developed by the author is representing a concept of an integrative GSCD framework that has been constructed which arranges all elements identified in the literature review as well as the relations between them. The framework is based on the typical green supply chain practices and producers. The starting point is represented by drivers and barriers. Also the framework represents the different dimensions (Environmental, organizational, and technological) which influence the firms and supply chain practices which have impact on green supply chain adoption where drivers and barriers are highlighted through the research besides the upstream and downstream engagement in enchasing and improving the GSC practices adoption. This framework helps to reduce the complexity and limit the number of potential alternatives.

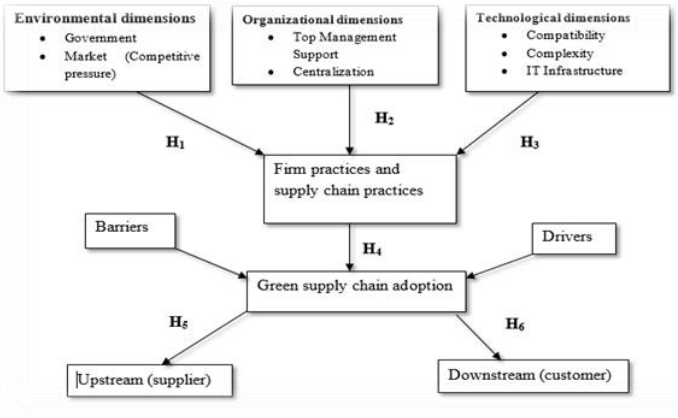

Figure 1. A proposed GSC Framework adoption - Source (Author)

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The drivers and barriers of green supply chain management have been classified into six alternate torrents (internal, external, customers, competition, market and suppliers). There are many obstructions facing GSCM implementation. Capital investment was considered as the most important barrier that industrial ecology faced. After capital investment is the shortage of trained personnel, current legislation, and company policies. Some small-medium enterprises (SMEs) believed that a financial cost would be added due to the better implementation of environment practice and this cost cannot push through customers therefore it is considered as an obstruction to implementation.

Therefore, these barriers to implementation of GSCM in Middle East industrial sector are: Lack of IT Implementation; Resistance to Technology Advancement Adoption; Lack of Organization Encouragement; Poor Quality of Human Resources; Market Competition and Uncertainty; Lack of Government Support System; Lack of Implementing Green Practices; Lack of Top Management Commitment; Cost Implications; Supplier Reluctance to Change towards GSCM and Unawareness of customers. All of these barriers having impacts on all green practices and increase the environmental disruption.

METHODOLOGY

For the sake of this research, the current research will follow the qualitative methods approach, where a semi-structured interview for the qualitative approach is designed. The target populations are Potential Experts, and Managers. Managers of the industrial sector in the Middle East are considered as the unit of analysis for this study. A number of 10 interviews were handled with managers of different SMEs in the industrial sectors to explore the drivers and barriers they face to achieve green supply chain management process. In the qualitative phase, data was analyzed into generative themes, which were cascaded to categories and codes. Data collected from interviews was analyzed by applying the content analysis using the NVIVO software package.

RESULTS AND FINDINGS

This section describes the qualitative analysis of the data. The findings of the study will be presented in this chapter with the purpose to introduce a qualitative analysis of the GSCM themes, categories and codes. Under the sample of this study and according to the responses received from the participants during an interview. The study findings had been found and illustrated in the following sections; each section represents a GSCM theme. Finally, a conclusion of this chapter's main findings and results.

Barriers

This section illustrates the findings regarding the prevailing Barriers and its categories; Outsourcing category with its codes; [Lack of Government Support, Complexity, reflects technological complexity usage through data transformation and Practices of Suppliers], Technology category with its codes; [Fear of Failure, Lack of new technology, and Lack of Materials], Knowledge category with its codes; [Lack of Environmental Knowledge, Lack of awareness about reverse logistics, and Perception of "out-of-responsibility" zone], Financial category with its codes; [Financial Constraints, High cost of Investment cost is high to implement green practices like eco design, green manufacturing, and Cost of switching to a new system], finally the Involvement and Support category and their codes; [Lack of training courses, Lack of customer awareness, Lack of top management involvement, and Poor supplier commitment]. Figure 1 shows in detail the importance of each code of the Outsourcing

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category. As shown Lack of Government Support code received "8" responses, while, Practices of Suppliers code received "7" responses. Finally, Complexity code received the lowest responses, "6" responses which means that Lack of Government Support code is relatively the most important factor to the Outsourcing category.

First the Technology category. As shown Lack of new technology lack of IT implementation is an important barrier to achieve efficient GSCM code received "8" responses, while, Lack of Materials Industries have pressure of lowering the prices at the cost of environment for their survival code received "7" responses. Finally, Fear of Failure code received the lowest responses, "6" responses which means that Lack of new technology code is relatively the most important factor to the Technology category. Second, shows in detail the importance of each code of the Knowledge category. As shown Lack of Environmental Knowledge code received "9" responses, while, Lack of awareness about reverse logistics code received "7" responses. Finally, Perception of "out-of-responsibility" zone code received the lowest responses, "5" responses which means that Lack of Environmental Knowledge code is relatively the most important factor to the Knowledge category. Third, shows in detail the importance of each code of the financial category. As shown Cost of switching to new system code received "9" responses, while, Financial Constraints code received "7" responses. Finally, High cost of Investment cost is high to implement green practices like eco design, green manufacturing received the lowest responses, "6" responses which means that Cost of switching to new system code is relatively the most important factor to the Financial category. Fourth, shows in detail the importance of each code of the Involvement and Support category. As shown Cost of Lack of top management involvement code received "8" responses, while, Poor supplier commitment code received "7" responses, then Lack of customer awareness code received "6" responses. Finally, Lack of training courses code received the lowest responses with "5" responses which means that Lack of top management involvement code is relatively the most important factor to the Involvement and Support category.

Finally the fifth category, shows the Barriers' categories. Which could be observed that Involvement and Support category ranked the highest in importance to the Barriers as it received "26" responses, while Financial category ranked the second in importance as it received "23" responses, the lowest responses was for both of the Outsourcing Technology, and Knowledge categories which they received "21" responses. Besides shows the Barriers' categories. Which could be observed that Involvement and Support category ranked the highest in importance to the Barriers as it received "26" responses, while Financial category ranked the second in importance as it received "23" responses, the lowest responses was for both of the Outsourcing Technology, and Knowledge categories which they received "21" responses.

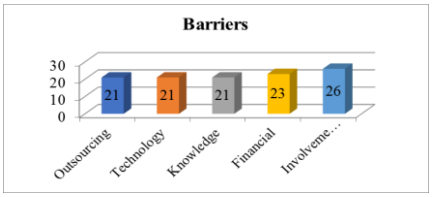

Figure 3. Barriers

Drivers

This section illustrates the findings regarding the prevailing Drivers and its categories; Government category with its codes; [CEO Initiative, Government Requirement, and

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International Requirement], Managerial category with its codes; [Waste Management, Top Management, ISO 50001, and Company Policy], Economic Benefits category with its codes; [Long Term Cost, Cost Reduction, and Health & Safety]. Figure 7 shows in detail the importance of each code of the Government category. As shown CEO Initiative code received "10" responses, while, both of Government Requirement, and International Requirement codes received equally "9" responses. This means that CEO Initiative code is relatively the most important factor to the Government category. In detail the importance of each code of the Managerial category. As shown Top Management code received "10" responses, while, ISO 50001 code received "9" responses.

Finally, both of Waste Management, and Company Policy codes received the lowest responses with equally "8" responses which mean that Top Management code is relatively the most important factor to the Managerial category. The importance of each code of the Economic Benefit category. As shown, both of Long Terms Cost, and Cost Reduction codes are equally received "10" responses, while, Health & Safety code received "9" responses which means that both of Long Terms Cost, and Cost Reduction codes are relatively the most important factor to the Economic Benefit category. Last Figure shows the Drivers' categories. Which could be observed that Managerial category ranked the highest in importance to the Drivers as it received "35" responses, while Economic Benefit category ranked the second in importance as it received "29" responses, the lowest responses was for the Government category as it received "28" responses.

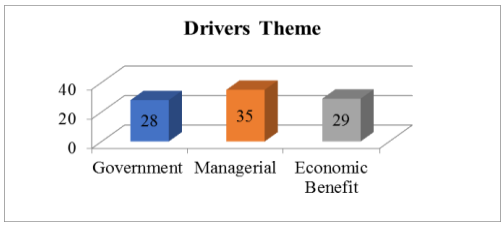

Figure 4. Drivers

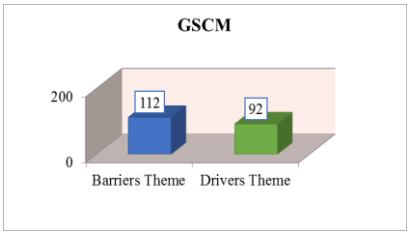

Figure 5. Shows the overall model for GSCM themes (GSCM)

CONCLUSION

This research includes many objectives that differ between defining the significance of GSCM, identifying the barriers and drivers of GSC implementation, determine the effectiveness of barriers on GSC adoption, and develop a GSC Framework which is stated in the literature review part is to enhance GSCM adoption, and verify and validate the Framework in the industrial sector. Therefore, all steps followed in this research, including literature review, selecting the research method, targeting population and sample study, and finally analyzing data, mainly serve these referred objectives. Testing Drivers and Barriers from the semi-structured interview reached the same results. Shown by the reviewed literature. It could be noted for the Barriers that Involvement and Support

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category ranked the highest in importance to the Barriers theme as it received "26" responses, while Financial category ranked the second in importance as it received "23" responses, the lowest responses was for both of the Outsourcing Technology, and Knowledge categories which they received "21" responses. Moreover, according to the Drivers it could be noted that Managerial category ranked the highest in importance to the Drivers theme as it received "35" responses, while Economic Benefit category ranked the second in importance as it received "29" responses, the lowest responses was for the Government category as it received "28" responses.

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