GREEN SUPPLY CHAIN MANAGEMENT AS A FORM OF ENVIRONMENTAL INNOVATION IN DEVELOPING COUNTRIES: A REALITY OR A MYTH?

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ABSTRACT

The purpose of this research is to explore top management perceptions about environmental innovation and explore Green Supply Chain Management (GSCM) practices adopted internally by food manufacturers in Jordan as a form of environmental innovation. To achieve this objective, a qualitative approach was used, 12 in-depth semi-structured interviews were conducted with 12 top managers of leading food manufacturers in Jordan. Data was coded and analyzed using NVIVO 12. The results suggest that environmental innovation is a reality that is practiced and that some food manufacturers in Jordan are implementing a variety of GSCM practices including pollution prevention practices, cleaner production practices, cleaner energy, water and energy conservation, green packaging and waste management. However, manufacturers are facing some challenges that might hinder their ability to innovate.

Keywords: GSCM, Environmental Innovation, Food Manufacturer, Clean Energy, Clean Production

INTRODUCTION

In the last two decades, environmental concerns about the level of pollution, emissions and climate change have emerged as a vital consideration for businesses. Initial responses to these pressures were mainly targeted at the internal operations level. However, since environmental pressures have gradually amplified, companies started to extend their environmental efforts to include the entire supply chain. Since then, the term GSCM was developed which incorporates the 'green' concept into Supply Chain Management (SCM) activities to address the impact of SCM activities on the natural environment. GSCM refers to "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" (Srivastava, 2007). This definition has been broadly accepted and used in many studies because it emphasizes the various purposeful practices that companies may adopt to tackle different environmental issues throughout the different points and stages of their supply chain aiming to minimize their environmental impact.

GSCM has become the buzz word in operations management research in the last decade; a plethora of papers has been published tackling different aspects of this field. Additionally, a significant number of companies all over the world have implemented various GSCM practices (Abdellatif, 2021). Companies adopt a variety of practices at different points of their supply chains where some focus on the internal level; others may focus on the upstream or downstream (Aloqool et al., 2021; Alqudah et al., 2020; Abdellatif & Graham, 2019). GSCM practices have recently been linked to the concept of environmental innovation (Zhu et al., 2012a; Zhu et al., 2012b; Zhu et al., 2017; Ma et al., 2018), which refers to the generation or adoption of a new concept, process, product, procedure, practice or managerial system to lessen the environmental

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impact of any operation through reducing the consumption of resources and minimizing waste or generating less environmental damage (Li et al., 2017; Vasi, 2007). Pollution prevention, green product design, resource usage, and waste management are all examples of environmental innovation (Almajali, 2021). These practices build on the classic definition of innovation, which is defined as the development or adoption of a new product, process, system or service to achieve a certain goal (Baregheh et al., 2009).

Environmental innovation encompasses both technological and non-technological inventions, including environmental product innovation and environmental process innovation (Lin et al., 2014) and environmental managerial innovation (Tang et al., 2018). The alteration of a product design to lessen its negative affect on the natural environment at any point of its life cycle, or the development of new environmental-friendly products, are both examples of environmental product innovation. Further, environmental process innovation, relates to any change in the manufacturing process that lowers the negative impact on the environment throughout acquiring materials, production, storage and distribution. While, environmental managerial innovation, refers to novel management techniques, business models, procedures or organizational structures that mitigate negative environmental impacts. Environmental management, energy management and green marketing are among the non-technological environmental innovations adopted by businesses (Fiore et al., 2017; May et al., 2017; Montobbio et al., 2018). To date, research has mainly focused on technological environmental innovations than non-technological environmental innovations (May et al., 2018; Li et al., 2017).

Four terminologies have been used interchangeably in the literature to refer to innovations that lessen negative consequences on the natural environment: “green”, “environmental”, “sustainable” and “eco” (Xavier et al., 2017; Salim et al., 2019). Some experts argue that the notion of environmental innovation is in line with the goals of GSCM (Zhu et al., 2012a; Zhu et al., 2012b) and that environmental innovation is the cornerstone of GSCM (Seman et al., 2012). Furthermore, (Zhu et al., 2010) used the term GSCM innovation to describe a distinctive type of environmental innovation.

Furthermore, environmental innovation can take many forms, ranging from creating and producing new and environmentally-friendly goods through continual and incremental improvements to designs and internal processes to radical and revolutionary changes to business processes and models (Jakhar, 2017). As a result, environmental innovations can be divided into two types: radical environmental innovation, which focuses on improving the environmental performance of a product or a process through major alterations and modifications, and incremental environmental innovation, which focuses on improving the environmental performance of a product or a process by implementing small and incremental. Since incremental environmental innovations are less dangerous and less expensive, they are more common in business world than radical environmental innovations (Dewick & Foster, 2018).

Further, research on GSCM so far has significantly focused on countries; few studies considered exploring this phenomenon in developing countries (Zhu et al., 2017; Mitra & Datta, 2014). It is believed that developed countries have more stringent environmental laws and regulations along with higher environmental awareness. Thus, companies in these countries have progressed in their environmental practices more than companies in developing countries. They tend to proactively address environmental issues and adopt a variety of GSCM practices beyond the regulatory requirements. However, as environmental concerns are accumulating and becoming more prominent in developing countries, developing countries began to regulate some environmental laws. These laws have exerted more pressures on companies in developing countries to reduce their environmental impact and green their practices (Esfahbodi et al., 2016). Moreover, the extant literature on GSCM in developing countries has primarily conducted in few countries including; China, India, and Malaysia (Zhu et al., 2017; Prasad et al., 2016; Tan et al.,

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2016). Thus, there have been many calls to explore GSCM in different regions and industries among developing countries (Laosirihongthong et al., 2013; Jabbour et al., 2015; Vijayvargy et al., 2017; Jia et al., 2018). There is a scarcity of research about GSCM in the Middle East region and even avoid of research in Jordan. Thus, this research aims to fill this gap by exploring top management perception about environmental innovation and exploring GSCM practices adopted internally by food manufacturers in Jordan as a form of environmental innovation.

MATERIALS AND METHODS

12 qualitative semi-structured interviews were conducted with 12 top managers of leading food manufacturers in Jordan. Semi-structured interviews were used because they fit the exploratory nature of this research. The researcher prepared a flexible list of open-ended questions based on the literature review and during the interviews, interviewees were allowed to elaborate on some points or to give examples, or even move the discussion into some exciting areas that the researcher might not be aware of. The participation in this research was voluntary and interviewees were informed that their responses would be anonymized and recorded. The researcher conducted the interviews herself between May and June 2021. Each interview lasted between 40 to 60 minutes. Afterwards, interviews were transcribed, coded and analyzed using *NVIVO* 12.

RESULTS AND DISCUSSION

As for the first theme concerning top management perception about environmental innovation, our interviewees demonstrated a good understanding of environmental innovation as a concept. One of them emphasized that being environmentally innovative entails a continuous search for new ways to improve environmental performance. However, they have translated their understanding into a variety of practices. Some of our interviewees interpreted environmental innovation into procedures of recycling and remanufacturing their waste, and others into new procedures of minimizing their waste, or new procedures for cleaner production, or cleaner energy. Some of these beliefs and perceptions are demonstrated in the following quotes,

"For us, environmental innovation means doing our best in terms of recycling and remanufacturing our waste".

"We in Jordan are still very new in terms of environmental friendliness; I might be considered as an environmental innovator just because I am using a special method for smoking meat that minimizes my emissions".

"I believe we are an innovative company, we are among the first companies to use solar energy to produce electricity. What's better than reducing your energy bill and save the environment!!"

"When it comes to new green ideas, I am willing to support them and implement them. It is a cycle; it never ends. It is more of a way of thinking and obsession. Once you start implementing innovative practice, you can't stop, you become obsessed with the idea and you want more".

"I think being environmentally innovative means searching continuously for new ways of managing your waste".

It is worth mentioning that some of our interviewees highlighted some challenges that Jordanian manufacturers might face which might hinder their ability to implement environmental innovative practices. These challenges mainly relate to cost or lack of environmental awareness and knowledge in the society. The following quotes demonstrate some of these challenges,

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"I want to be a green company; I want to be innovative. To be honest, it is too expensive. I am trying to get the license for installing solar panels and start using cleaner energy in my factory, it is costly. Basically, we cannot afford it".

"Let's not deny that, environmental innovation is still in its infancy stage in Jordan. We are looking for implementing some innovative practices but again it is not easy. It is costly".

"People are still not into environmental practices, we tried to introduce the idea of bio-degradable packaging but customers did not seem interested what so ever. They are looking for the cheapest prices regardless of anything else".

"We are trying to recycle some of our waste such as plastic and carboard, but to be honest we do not trust most of the recycling companies here. We discovered that some of these companies are re-selling the plastic instead of actually recycling it. We need more awareness and stricter laws if we really want to move on in terms of saving the environment".

As for the second theme concerning GSCM practices adopted internally by food manufacturers in Jordan, our data shows that the interviewed companies adopt a variety of GSCM practices at their internal operations. These include pollution prevention practices, cleaner production practices, cleaner energy, water and energy conservation, green packaging and waste management. The following quotes demonstrate some of these practices,

"We have installed multi filters on our smoking and furnaces stacks and we do periodic measurements for emissions and periodic maintenance for the filters".

"We sort our waste and we recycle as much as much as we can".

"Water is essential in our production lines. We treat the wastewater before despoing it safely by coordinating with the Ministry of Environment".

"We use liquid smokers for smoking our meat. It is an innovative method of minimizing emissions compared to traditional smoking methods".

"We use special filters to purify the frying oil before disposing it safely".

"Our factory ceiling is filled with solar panels, we produce electricity and we hope that in the near future we will be able to produce all the energy we need".

"We started using some environmentally friendly packaging materials".

"When it comes to saving water, we use high-pressure machines to clean the factory and the production line".

"We were not successful in obtaining the necessary license for installing solar panels but we try our best to minimize our energy bill. We use LED lights and motion detectors".

CONCLUSION

This research showed that, to a certain extent, environmental innovation might be a reality in developing countries. Food manufacturers in Jordan demonstrated a high degree of interest and understanding of the concept. However, they have translated it into a variety of green practices including pollution prevention, cleaner production practices, cleaner energy, water and energy conservation, green packaging and waste management. Unsurprisingly, many challenges reside in developing countries relating to cost and lack of environmental awareness and knowledge among these societies. These challenges might hinder the ability of manufacturers in these countries to implement environmentally innovative practices. This research was limited by the number of the interviewed companies, which might affect the generalizability of the findings to the broader population. However, data saturation was achieved by the number of interviews conducted in this research. Further, there is a potential for future research to explore environmental innovation in different developing countries and different industries.

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