Investigating the Role of Green Supply Chain on Sustainable Development in Parsian Gas Refinery

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Abstract:

The purpose of this research is to investigate the role of green supply chain management on sustainable development in Parsian gas refinery. The present research is an applied and descriptive survey method. The statistical population of this research is 105directors, senior managers, operational managers and intermediate managers. In this research, the non-inferential improvement of the judgment method was used to determine the sample. The data gathering tool in this study is a standard two-part questionnaire on green supply chain management and sustainable development (Rahmani, 2015). Validity of the questionnaires based on expert's view and their reliability based on Cronbach's alpha coefficient for green supply chain questionnaire was 0.838 and for Sustainable Development Questionnaire was 0.903. The research method was linear regression analysis. The results of this research indicate that the dimensions of green supply chain management have a positive and significant effect on the sustainable development dimensions in Parsian gas refinery.

Key words: Green Supply Chain Management, Green Supply Chain, Sustainable Development, Parsian Gas Refinery.

1-Introduction

Today, most people in the world are paying more attention to protecting the environment and biological resources. This positive sensitivity has intensified so that even the industrialists try to use it to make a significant step towards the acceptance of the goods they supply to customers and to use the environmental point of view as a competitive advantage. In most countries, it has come

to the conclusion that sustained and sustained time development is extremely precise when using limited and non-renewable resources. Governments are also trying to establish environmental laws (green) in this regard more than ever before. For this reason, certain standards have been laid down. The factors mentioned (customer demand, government regulations, and standards) have been the triggers for this change. Managing these changes in the supply chain along with the flow of information throughout the supply chain introduces a new concept in the name of GSCM or Green Supply Chain Management (Noruzzadeh et al., 2012).

Industries should be aware that they are environmentally responsible for designing their new products (Gonzalez Benito, 2008) and should design products that have the least pollution and cost for the environment. Therefore, joint efforts must be made between producers and suppliers in order to create green systems that comply with environmental regulations in production. The fate of a product, in terms of contamination at the end of the life cycle, is one of the issues that can be decided at the design and selection stage of the material and process (Zoe & Sarkis, 2008). It should be noted that one of the important tools available to supplying companies is to cooperate with buyer companies in green supply chain management. Company products may be exported to world markets and customers may be outside the geographical boundaries, but its suppliers are not aware of the environmental conditions of the country of destination. Therefore, the buyer companies should, with other information and other measures, support the suppliers on the complex regulations that are required in various international markets (Lee and Klasson 2008, Lee, 2009).

The theory of resource dependence explains the environmental impact on organizations using internal and external perspectives. The domestic perspective is due to the internal assessment of the amount of resources consumed in any activity with organizational productivity (Piper and Salan, 1978). Leading global companies like Samsung and LG Electronics claim to operate more efficiently in all aspects. And it's because of the implementation of green supply chain management (Lee, 2007). Companies that can successfully implement Green Supply Chain Management (GHQ) will develop internal operations that will be erased by improving the decision making processes (Lee, 2011). Lippmann's (2001) interviews with a number of small companies that have implemented Green Supply Chain Management (CGM) have met the results of reduced time cycles, reduced costs, and increased sales. Lee (2009) has conducted case studies on green

management in small and medium enterprises. The results of his studies show that systematic green management reduces production costs by increasing operational efficiency such as less water consumption, reducing wastewater production and the use of stored items. Today environmental management, with emphasis on environmental protection, has become one of the key issues for customers, governments, industries and competitors, and international pressures have required organizations to produce environmentally-friendly products and services. Hence, over the last few years, GSCM has proven to support governments and companies in creating a sustainable environment and creating a green economy (Rahmani, 2015). Therefore, in this research, the effect of green supply chain on sustainable development in Parsian Gas Refinery is investigated.

2. Theoretical Basics of Research

2.1 The concept of sustainable supply chain management:

Sustainable supply chain management is rooted in sustainability and involves a widespread approach to supply chain management. Sustainability in the supply chain means moving the supply chain towards the social, economic, and environmental aspects and addressing the current problems in the traditional supply chain. In the scientific documentation, there are several definitions for the sustainable supply chain. According to Carter and Rogers, sustainable supply chain management means a strategy, clear integration, and the achievement of the social, environmental, and economic goals of an organization in systematically collaborating with key business processes within an organization to improve the long-term economic performance of the supply chain and its individual performance. In another paper, the management of materials, information and capital flows, as well as cooperation among companies involved in the supply chain, are defined as sustainable supply chain management with respect to the integrated economic, environmental and social goals derived from the customer and stakeholders.

2.2 Modern Supply Chain Management:

Green, flexible and lean approaches to new management approaches to the supply chain are key to sustaining the supply chain, which we will continue to introduce.

2-3-Green Supply Chain Management:

Green Supply Chain Management was introduced by the Michigan State University of Industrial Research in 1996, which is in fact a new management model for environmental protection. Green supply chain management is a product lifecycle perspective that includes all stages of raw material, product design and manufacturing, product sales and transportation, product use and product recycling. Using supply chain management and green technology, the organization can reduce environmental negative impacts and achieve optimal use of resources and energy.

2.4 Flexible Supply Chain Management:

Flexibility The system's ability to respond to market changes and environmental shocks is essential, without losing the capacity to allocate resources or avoiding the provision of services. A flexible system with adaptive capacity and system disturbance, without the inadequate adaptation of the system, is widely used in organizations.

2.5 Lean Supply Chain Management:

The Lean Management Approach was first introduced and developed by the Toyota Motor Company in Japan in 1998. This management has a profound effect on economic and social sustainability. Feldner believes that the steadiness of the evolutionary stage after pure management will lead to the elimination of waste and the reduction of losses in the supply chain, to increase overall quality management and timely supply chain processes. One of the contemporary issues is the reduction of waste lead in order to enhance environmental performance, which is a prerequisite for pure management.

6. Presenting patterns of modern management approaches to achieving a sustainable supply chain management:

In this regard, it is necessary to clarify that each of these management practices can improve these problems. Each of the social, economic and environmental aspects has the following criteria:

- The social aspects of sustainable supply chain focus on competitive metrics and include quality, time, speed, and customer satisfaction.
- Economic aspects include costs, productivity, environmental incomes and environmental costs.
- The environmental aspect also includes green image issues, emissions and business losses.

Now, given the pattern presented in the above figure and criteria, it can be concluded that green management implements the environmental aspect and its criteria. Flexible management in the flexible supply sector involves speed and time in the social aspect. And in the flexible transport sector, it includes environmental criteria. And lean management includes other sustainable social and economic criteria for a supply chain.

3. Research background:

Aghaie and Maktabi (2014) conducted a study entitled Green Logistics Development and the deployment of sustainable development strategies. Summary of this research: The purpose of the research is to provide an effective determinant of the development of green logistics concepts as an element of sustainable development.

Jalali (2014) conducted a research entitled Green Supply Chain and its main indicators and indicators. The summary of this research: The present paper describes the green supply chain and its benefits and its application.

Ashourian (2013) conducted a study titled "Prioritizing the Effective Components of Managing the Green Supply Chain Management in the Tourism Industry" from the viewpoint of managers of recreational-residential complexes. In summary, the tourism industry is an industry whose final production is service. Planning, legislation, management, implementation and monitoring of this process require special attention, including environmental considerations, which is one of the principles for the sustainable development of local communities as well as sustainable development of tourism. Following the development and expansion of the number of recreational-residential complexes in Mazandaran province in the wake of the rapid development of the tourism industry in this province, the need to adopt modern management approaches such as green supply chain management in utilizing natural resources and preserving the environment based on the principle of sustainability is felt. The main purpose of this applied survey is to extend the attention of managers, practitioners, and in particular planners and researchers in the field of tourism to the concept and application of supply chain management in this industry. The key issue in using this approach is to have an impact and a priority that has influential factors. Therefore, after studying literature and conducting interviews with various industries such as the tourism industry and experts in the management of the supply chain of an analytical model, the basis of designing a data

collection tool was a questionnaire packed with a Likert scale. The reliability coefficient of this researcher made questionnaire was 0.80 and its verbal validity was confirmed by the experts.

Deylami Moezi et al. (2012) conducted a study on the relationship between greenhouse gas supply function and operational functions through supply chain management model. Summary of this research: The most important issues of the current generation of low resource and environmental pollution is a coherent strategy to realize increased productivity along with green management of green productivity, which has been identified as the key to sustainable development. One of the tools of this green chain approach is to investigate the relationship between functions of the green supply chain and the operational functions of the organization using the Green Supply Chain Model. This model, which includes a link between supply chain integration and green supply functions, suggests that general supply chain management is an introduction to environmental activities and reduction of energy consumption. Green supply chain functions are identified as the level of environmental co-operation and control with the main suppliers and customers. The integration of the supply chain consists of logistical and technological integration. The identification of the relationship between variables and green supply chain structures with the operational functions of the organization as well as the selection of technology related to environmental issues is one of the issues examined in this study. The attention of managers, especially the petrochemical industry, to the green chain is to encourage managers and industry decision-makers to invest in green technologies for the purpose of this study. The present model has been studied and validated in a complex of petrochemical complexes in the country, and the correlation of variables has been investigated by Pearson. Therefore, the assumptions of this research were not approved, the causes of which have been investigated and appropriate proposals have been presented.

Nurrozadeh et al. (2012) conducted a research called Green Supply Chain Management (CHP), a challenging challenge of the present century. The summary of this research: Using GSCM Green Supply Chain Management Strategies reduces waste; reduces resource utilization and consequently reduces energy consumption and pollution of the environment. This ultimately increases the efficiency and performance of organizations and companies.

Hashemi et al. (2012) conducted a research on the analysis of sustainable development incentives in Iran's oil and gas supply chain. In summary, research results show that incentives for reducing

consumption and increasing energy efficiency, developing, improving and complying with the HSE rules motivate senior managers and middle managers, laws and regulations of the state, and gain competitive advantage and market leadership, respectively are the most important drivers of sustainable development in Iran's oil and gas supply chain.

Dehghanian and Hashemi (2011) conducted a research on the assessment and selection of suppliers in the context of sustainable development through the ANP Network Analysis Technique. This paper tries to provide all quantitative and qualitative selection criteria through the ANP analysis process technique in both the traditional and sustainable development environment and, considering the relationships and effects that exist between the selection criteria, different suppliers will be selected and evaluated. In order to achieve sustainable development in a supply chain, there is a need for balanced attention to the three dimensions of sustainability (economic, environmental and social dimensions). Implementing any plans for sustainable development in supply chains requires an integrated approach that can take these three dimensions into consideration. Hence, decision makers in supply chains should identify and understand the relationships and interdependencies between complex factors that accelerate or hinder sustainability, and engage in their decisions. In this study, the researchers used the FEMA DEMATEL method to analyze the incentives for sustainable development in the supply chain of the oil and gas industry. In order to identify and validate the drivers of sustainable development for the top ten managers and experts of the superior suppliers of oil and gas industry, including three engineering and management consultancy firms, three supplier companies, and four contracting companies have been used (Hashemi and Colleagues, 2012).

Brendenburg and colleagues conducted a study entitled "Quantitative Models for Sustainable Supply Chain Management" in 2014. This study provides a content analysis of 134 papers carefully identified with formal models that have a sustainable aspect in the supply chain. Conclusions suggest that multiple opportunities and insights can benefit from the development of a variety of tools and factors raised in formal models.

Muma and colleagues have conducted a study entitled "Green Supply Chain Management and Environmental Performance among Tea Party Processing Companies in Kenya" in 2014. The purpose of this study is to investigate the effect of green supply chain management on the environment. The relationship between variables was analyzed using correlation analysis and

multiple regression models with SPSS software. The findings indicate that there is a positive and meaningful relationship between green supply chain management and performance.

Seah et al. reviewed the structural relationship between supply chain management and organizational performance in Malaysia's automotive industry in 2014; the findings of this study indicate that supply chain management has a direct impact on the performance of the organization.

Haraj and Wisconsin reviewed the greenhouse gas supply chain management survey in India in 2012. They argue that the reason for the low environmental performance index of Indian companies is the lack of consideration of the green supply chain management approach in four dimensions (green purchasing, green production, green marketing and green logistics).

Diabetic and Gwandan conducted a study entitled "Investigating the Impact of Drivers on Implementation of Green Supply Chain Management" in 2011. The goal is to develop an interpretive structure modeling framework for greenhouse gas supply chain management in a case study of a manufacturing company in southern India, which various stimuli were identified from supply chain management and then, based on literature in this regard, and interviews with experts, provided a model based on this.

Tunnel and Alpine conducted a research on risk management and management for supply chain networks in 2010. The purpose of this study is to illustrate how a network model can be used for modeling and analyzing a supply chain network, which was developed by an industrial case study. The findings show that system performance can be improved by using improved risk management measures and can reduce overall system costs by reducing scenarios.

4. Research objectives

4.1 The main purpose

The main objective of the research is to investigate the effect of green supply chain management on sustainable development in Parsian gas refinery.

4.2 Special Purposes

1. The Impact of Internal Environment Management on the Economic Dimension of Sustainable Development in Parsian Gas Refinery.

2. Investigating the Effect of Ecological Design on the Economic Dimension of Sustainable Development in Parsian Gas Refinery.

3. The Effect of Green Purchases on the Economic Dimension of Sustainable Developmentin Parsian Gas Refinery.

4. Investigating the Effect of Collaboration with Customers on the Economic Dimension of Sustainable Development in Parsian Gas Refinery.

5. The Impact of Capital Return on the Economic Dimension of Sustainable Development in the Parsian Gas Refinery.

6. Investigating the Impact of Internal Environmental Management on the Social Dimension of Sustainable Development in the Parsian Gas Refinery.

7. Investigating the Effect of Ecological Design on the Social Dimension of Sustainable Development in Parsian Gas Refinery.

8. The Impact of Green Purchases on the Social Dimension of Sustainable Development at Parsian Gas Refinery.

9- Investigating the Impact of Customer Relationship on the Social Dimension of Sustainable Development at Parsian Gas Refinery.

10. Investigating the Impact of Capital Return on the Social Dimension of Sustainable Development in the Parsian Gas Refinery.

5. Research method

The purpose of this study is to investigate the effect of green supply chain management on sustainable development in Parsian gas refinery and to determine the empirical relationship between green supply chain management and sustainable development and to add to applied knowledge in this regard; Accordingly, the present research is applied in terms of its purpose and in terms of collecting information, a descriptive survey one. The statistical population of this research is 105 directors, senior executives, operational managers and intermediate managers. In this research, the non-inferential improvement of the judgment method was used to determine the

sample. The data gathering tool in this study is a standard two-part questionnaire on green supply chain management and sustainable development (Rahmani, 2015).

6. Results of the research

For analyzing all hypotheses, regression analysis has been used.

6.1. Testing main hypotheses: Green supply chain management has a significant impact on sustainable development in the Parsian gas refinery.

Table 1. Results of the main hypothesis test using regression analysis

	β	B (Standardized)	p-value	t	R	R2	Significance test of regression	
							p-value	F
Constant (coefficient Green Supply Chain Management	1.679 0.555	0.882	0.000 0.000	20.461 15.165	0.882	0.777	0.000	222.969

Regarding the significant level, it is concluded that the regression is significant. Also, the coefficient of determination is 0.777, which shows that 77.7 percent of the changes related to sustainable development in Parsian gas refinery can be explained by the management of green supply chain.

6.2. Testing first special hypotheses: The dimensions of green supply chain management have a significant effect on the economic sustainability dimension of the Parsian gas refinery.

Table 2. Test results of first special hypotheses using regression analysis

independent variable (Dimensions of green supply chain management)	β	B (Standardized)	p-value	t	R	R2	Significance test of regression	
							p-value	F
Internal environmental management	2.383 0.216	0.798	0.000 0.000	18.316 4.612	0.798	0.636	0.000	21.270
Ecological design	2.411 0.247	0.764	0.000 0.000	17.10 4.045	0.764	0.583	0.000	16.361
Green purchasing	2.373 0.274	0.679	0.000 0.000	27.083 7.181	0.697	0.485	0.000	51.564
Collaboration with customers	0.890 0.711	.0.614	0.000 0.000	6.707 16.638	0.614	0.376	0.000	276.816
Capital Return	0.890 0.711	.0.712	0.000 0.000	3.103 14.528	0.712	0.506	0.000	215.149

With regard to the significance level obtained, we conclude that our assumptions are meaningful. The determination coefficient for internal environmental management dimension is 0.550, which means that 55% of the changes in the sustainable social development dimension of the Parsian gas refinery can be explained by the internal environmental management. Also, the coefficient of determination for ecological design dimension is 0.303, which indicates that 30.3% of changes in sustainable social development dimension in Parsian gas refinery can be explained by ecological design. The coefficient of determination for the green purchasing dimension is 0.345, which indicates that 34.5 percent of the changes regarding the sustainable social development dimension in the Parsian gas refinery can be explained and explained by the green purchasing dimension. The coefficient of determination for cooperation with customers is 0.450, which means that 45% of the changes regarding the sustainable social development dimension in the Parsian gas refinery can be explained by cooperation with customers. Finally, the coefficient of determination for the dimension of capital return is 0.446, which indicates that 44.6 percent of the changes in the

sustainable social development dimension in the Parsian gas refinery can be explained by the capital return dimension of the green supply chain.

7. Discussion and Conclusion

The purpose of this study was to investigate the effect of green supply chain management on sustainable development in Parsian gas refinery. The results showed that there is a positive and significant relationship between the dimensions of green supply chain management on the economic and social dimensions of sustainable development in the Parsian Gas Refinery. Supply chains have grown rapidly in recent years, and only focusing on economic performance to optimize costs or capital return cannot lead to sustainable development in the supply chain. The impact of various supply chain interventions on social life and environmental issues that lead to sustainable development should also be taken into account. To this end, the concepts of green supply chain management and sustainable supply chain management have emerged to address the social and environmental concerns associated with economic factors in supply chain planning. In recent years, with the growing growth of global awareness of the issue of sustainable development as well as more stringent government laws to protect the environment, green and environmentally friendly production has become an important issue for each producer. In recent years, with the growing growth of global awareness of the issue of sustainable development as well as more stringent government laws to protect the environment, green and environmentally friendly production has become an important issue for each producer. Therefore, an approach to assessing green suppliers is necessary to determine the appropriateness of suppliers to cooperate with the company. Assessment and selection of suppliers is a key and crucial process in the supply chain. Therefore, considering the sustainable development in the supply chain, choosing a green supplier is very important. Environmental issues are among the most important and challenging issues around the world, companies are always under pressure to regulate their operations in a way that does not have environmental damages. Commitment to the natural environment is significant. Traditional logistics models focus on minimizing costs with operational constraints, while green logistics is designed to sustainably generate and distribute goods with consideration for environmental and social factors. Therefore, the organization's goals focus not only on the economic impact of logistics policies, but also on minimizing the negative impacts on society. This attention has grown rapidly for the development of green logistics by companies, the

government and people, especially as traditional logistics does not meet the needs of modern society. The rapid growth of industry and industrial development threatens the natural environment of the country. The use of inappropriate and old technologies as well as inefficient management in the industries has caused unnecessary consumption of primary resources. The severity of environmental pollution from waste materials in cities and industrial gathering centers is such that it has attracted scientific and operational attention for proper disposal, or the proper recycling of these materials. Today, ensuring the sustainable development of each country depends on maintaining and optimizing the use of limited and irreplaceable resources in that country. Various measures and decisions have been made in this regard, including green laws and principles, such as the use of environmentally friendly raw materials in industrial centers, the reduction of the use of fossil and oil fossil fuels, the recovery of paper and the reuse of waste… The pressure of government regulations to meet environmental standards and the growing demand of consumers for the supply of natural products (green) has led to the emergence of a new concept of green supply chain management, which includes the product life cycle from design to recycling, in a way that is environmentally friendly. Parsian Gas Refinery, considering its goals and strategies, tries to highlight the importance of sustainable development in the organization and region by using the green supply chain to modernize its scientific and managerial methods in order to achieve the desired goals. It is hoped that this article will be used by organizations and companies to create and apply a supply chain and how it will be managed properly, in order to achieve an ideal organization with a comprehensive function in all three social, economic and environmental criteria.

It is also suggested in this regard:

- Establishing trust between the supplier and the company (adherence to principles, obligations, expertise, honesty)
- Determine the purpose and perspective of the shared work relationship with the supplier and determine the outlook
- Effective interpersonal communication between Buyer-supplier (listening-empathy-information-attention to nonverbal information)
- Create common interests with the supplier

- The managerial stability of the parties (the systematic organization of affairs and the observance of the principles of management - the commitment and support of senior management through effective communication with business parties)
- Management of environmental changes (economy, price, technology, culture, ...) including (considering the constant management principles of change - flexibility)
- Effective exchange of information between supplier and buyer by establishing effective communication lines.
- Provides performance indicators
- Establishment of a new educational base for creating a transformation in training education.
- To anticipate sufficient human resources in the structure of organizations.
- Employing employees in specialized occupations by managers.
- Conduct a continuous assessment of how employees work to improve their work process.
- To motivate employees by directors to better do business.
- Managers provide counseling opportunities to reduce mental reflections for employees.
- The director focuses on the development of organizational culture for each employee.
- The manager has the initiative to modify educational behaviors.
- Managers provide new strategies, partnerships with the implementation of the project.

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