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The Effects of Green Purchasing and Supply Policies on Enterprises' Competitiveness in Clothing Sector

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Abstract

On the one hand, ecological approaches and solutions lead the enterprises to differentiation and provide competitive advantage to them and on the other hand, they reveal protective perspectives in terms of environment, society, consumer and employee. Sustainability, which underlies the environmentally-conscious approaches, is based on the protection of environment, individuals' existences and future resources while the today's needs are fulfilled. Therefore, sustainability is achieved by the establishment of green supply chain, whose first ring is green purchasing and supply.

As it is known, clothing sector is one the oldest and fundamental sectors of the world. At the same time, this sector constitutes one of the most significant milestones of economic development, especially in terms of developing countries. This situation is also valid for Turkish clothing sector. In this context, clothing sector constitutes one of the most significant cornerstones of Turkey's economical and social development and growth policies towards exportation. The sector involves significant factors in terms of sustainability and green supply chain due to the used raw materials and auxiliary materials, production processes and working conditions.

In this study, green purchasing and supply policies, which constitute one of the significant cornerstones of sustainability, and their effects on enterprises are analyzed. For this purpose, green purchasing and supply processes and strategies of clothing enterprises, which operate in the hinterland of İzmir, and their effects on enterprises' competitiveness are investigated.

Key words: Green purchasing and supply, green supply chain, green procurement and sourcing, sustainability, clothing sector

1. Green Supply Chain Management

Recently, the environment has emerged as a hot issue for governments, societies, as well as business organizations. Its importance emanates from increasing environmental problems such as climate change, the depletion of natural resources, environmental pollution, global warming, ozone depletion, solid wastes and air pollution. Business organizations are considered to be the source of most of the environmental problems. It is observed that sourcing, manufacturing, logistics and marketing activities of these organizations have a negative impact on the environment. Therefore, the integration of environmental concerns and organizational performance started gaining attention over the recent decades [1,2].

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A number of scholars have addressed the importance of balancing the economic development and environment protection under the umbrella of green supply chain management. Going green, is thus considered an important step toward environmental sustainability [3]. Firms may receive several benefits by going green. They can reduce their energy consumption, enhance corporate social responsibility and brand image, attain sustainability in the competitive market and increase corporate revenue [4].

Green supply chain is a concept that combines green procurement, environmental management of manufacturing materials, environmental circulation, marketing and reverse logistics. Green supply chain is the extension of the traditional supply chain to include activities that aim at minimizing environmental impacts of a product throughout its entire cycle, such as green design, resource saving, harmful material reduction and product recycle and reuse [2].

Green supply chain management can be defined as an organizational philosophy which integrates environmental dimensions into the traditional supply chain management, including product design, supplier selection, procurement/sourcing, manufacturing processes, product packaging, logistics, distribution, end-of-life management of the product after its use and disposal, reuse and recycling activities [2,5,6]. In other words it is defined as the combination of green purchasing, green manufacturing and materials management, green distribution and marketing and reverse logistics [7,8,9].

Environmental benefits of green supply chain management can be summarized as; improvement in energy reduction, waste reduction, reduction in the consumption of natural resources, decrease in greenhouse gas emissions, reduction in pollution, less packaging in distribution activities, water conservation, increased energy efficiency, improved processing operations and reduced toxic chemical released into waterways whereas its business benefits can be listed as; increased profitability, competitive advantage, reduces cost (production, operation and distribution costs), improved value to operations, greater distribution of goods and services, increased product and service differentiation, access to foreign markets, improved customer service and retention, enhanced risk mitigation and management of environmental, social and market risks, improved distribution efficiency, optimize utilization of assets, reduction in transit times, improved inventory, increased innovation and reliability, alliances and alignments between suppliers and customers, improved continuity of business, refined reverse logistics, enhanced reputation, successful compliance processes, lowered compliance cost, avoidance of payment of non-compliance penalties and fees and enhancement of relationship with legal and government agencies [10].

2. Green Purchasing Concept

As explained in the first part, green purchasing concept is a significant part of green supply chain management. In the literature green purchasing is usually connected with individual consumers. However, in our research we investigate the green purchasing activities of enterprises. Therefore, in our research green purchasing concept also refers to green supply, green procurement and green sourcing.

Green purchasing is an important issue and has drawn international attention because it can be used to mitigate the environmental impacts of consumption and promote clean production technology in the green supply chain system [11]. Environmental regulations, customer pressures, social responsibility and expected business benefits are the drivers which influence firms to adopt green purchasing initiatives [1].

Green purchasing is defined as the implementation of an environmentally-conscious purchasing practice that reduces sources of waste and promotes recycling and reclamation of purchased materials without adversely affecting performance requirements of such materials [12,13]. In other words, it is an integration of environmental management into the purchasing function of an organization that attempts to ensure that the purchased materials meet the environmental objectives set by the purchasing companies, such as promoting reusability, recycling, eliminating hazardous material from product and substitution of materials. Green purchasing means purchasing of environment-friendly materials without sacrificing the traditional purchasing criteria of product quality, cost and delivery time [14]. The involvement and suppliers' support is crucial to achieving such goals [6].

Green purchasing activities can be summarized as; green suppliers (supplier certification (ISO 14000), supplier compliance and auditing, cooperation with suppliers and suppliers' environmental systems), environmental sourcing of raw materials, eco labeling of product (product content requirements that have desirable environmental attributes that reduce or eliminate hazardous items, product content restrictions and green product packing), waste management, reduction of waste produced, packaging issues, environmental regulations, resource reduction, resource reuse and resource recycling [1,11,14,15,16].

The key benefits of green purchasing include cost reduction, waste reduction and enhanced corporate image [16]. It contributes significantly towards source reduction of pollution in terms of recycling, re-use and low-density packaging and towards waste elimination in terms of scrapping or dumping, recycling and sorting for non-toxic incineration and bio-degradable packaging [15].

Green purchasing management also improves the performance of the purchasing function, although the impact is greater when the organization forges lasting alliances with its suppliers [13]. Besides, operational performance is positively improved when implementing green purchasing and environmental cooperation practices [2]. Green purchasing has been found to be a good tool for economic vitality as it improves the firm's economic performance resulting from reduction in material and energy consumption, as well as improvements in market share, average sales return and average profit [2,17].

In spite of these advantages; several challenges/obstacles of green purchasing implementations are determined in the literature such as lack of management support, lack of buyer awareness, lack of supplier awareness, the suppliers' willingness to participate in green supply chain initiatives, limited knowledge, limited resources, deficient company-wide environmental standards, deficient environmental orientation, lack of regulations, cost-effectiveness of sustainable procurement, high costs of green procurement, uneconomic recycling, uneconomic

re-use and high costs of environmental programs [12,15,18,19]. Another difficulty associated with formulating a green purchasing strategy is that green purchasing may reduce the pool of qualified suppliers due to stricter environmental quality standards [12].

3. The Purpose and the Method of the Research

The research aims to analyze the green purchasing and supply processes of clothing enterprises, which operate in the hinterland of İzmir, and their effects on enterprises' competitiveness. In accordance with the aim of the research; successful, medium and big sized clothing enterprises, which export and operate in the hinterland of İzmir, have been determined as target group. Interviews have been made with the purchasing managers of clothing enterprises within the target group and a questionnaire form consisting of 7 main questions (48 inferior questions) have been sent to them. During the limited period of time assigned for this research, 7 enterprises (Üniteks, Sun Textile, Akar Textile, TYH, Roteks, Cu Textile and Egedeniz Textile) have been included in the research. After the conduction of the survey, the collected data have been evaluated and analyzed.

4. Findings of the Research

The participating clothing enterprises approximately possess 102 suppliers whereas their average working period is 8 years. They own environmental certifications and standards such as; OEKO-TEX, Organic Content Standard 100 (OCS), ISO 9001:2015, ISO 14001:2015, ISO 50001:2011, Global Organic Textile Standard (GOTS), Recycled Claim Standard (RCS/Control Union), Global Recycled Standard (GRS). As it can be seen, Turkish clothing enterprises work with many suppliers and they aim to establish long-standing cooperation with their suppliers. If Turkish enterprises' average lifetime, which is approximately 12,5 years, is taken into consideration; it can be said that average working period with suppliers (8 years) is considerably long. On the other hand, enterprises have applied to environmental certification bodies in order to certify their possessed green elements. The possessed environmental certifications and standards enrich enterprises' customer portfolios and increase their recognition and corporate image.

The survey offers 45 statements, which analyze the green purchasing and supply processes of clothing enterprises and their effects on enterprises' competitiveness. The purchasing managers of the participating Turkish clothing enterprises are required to choose their agreement levels for each of these statements. In quinary likert scale never is coded as 1, rarely is coded as 2, occasionally is coded as 3, frequently is coded as 4 and always is coded as 5. The findings are given in Table 1, 2, 3 and 4.

According to the participating clothing enterprises, eco-friendly packaging materials are the most frequently purchased green elements (Table 1). This green purchasing element is followed by eco-friendly auxiliary material/accessory purchases, eco-friendly product purchases, eco-labeled packaging material purchases, eco-friendly (natural) raw material purchases, eco-friendly chemical purchases, eco-labeled product purchases, eco-labeled auxiliary material/accessory purchases, eco-labeled raw material purchases, recycled packaging material purchases, eco-labeled chemical purchases, recycled raw material purchases, recycled product purchases,

recycled auxiliary material/accessory purchases, green power purchases, biodegradable raw material purchases, biodegradable product purchases, biodegradable packaging material purchases, biodegradable auxiliary material/accessory purchases, recycled chemical purchases and biodegradable chemical purchases respectively. As it can be seen, clothing enterprises indicate that they frequently purchase eco-friendly packaging materials, raw materials, products, chemicals and auxiliary materials/accessories whereas they rarely bought biodegradable raw materials, products, packaging materials, chemicals and auxiliary materials/accessories. This result is one of the most significant underlying reasons of being an important clothing supplier of European Union and world (Turkey is the third biggest clothing supplier of European Union, whereas it is the seventh biggest clothing supplier of the world).

Table 1. Distribution of participating clothing enterprises according to green purchasing elements

	N	Mean	Std. Deviation
Our enterprise purchases eco-friendly packaging materials.	7	4,71	0,76
Our enterprise purchases eco-friendly auxiliary materials/accessories.	7	4,43	0,98
Our enterprise purchases eco-friendly products.	7	4,43	0,98
Our enterprise purchases eco-labeled packaging materials.	7	4,43	0,98
Our enterprise purchases eco-friendly (natural) raw materials.	7	4,14	1,07
Our enterprise purchases eco-friendly chemicals.	7	4,14	1,57
Our enterprise purchases eco-labeled products.	7	4,14	1,07
Our enterprise purchases eco-labeled auxiliary materials/accessories.	7	3,86	1,57
Our enterprise purchases eco-labeled raw materials.	7	3,57	1,51
Our enterprise purchases recycled packaging materials.	7	3,29	1,38
Our enterprise purchases eco-labeled chemicals.	7	3,00	1,63
Our enterprise purchases recycled raw materials.	7	2,71	0,76
Our enterprise purchases recycled products.	7	2,71	0,76
Our enterprise purchases recycled auxiliary materials/accessories.	7	2,71	0,76
Our enterprise purchases green power (electricity which is obtained from renewable energy resources such as biogas, bio-fuel, geothermal energy, solar energy, wind power and water energy).	7	2,71	1,80
Our enterprise purchases biodegradable raw materials.	7	2,43	0,98
Our enterprise purchases biodegradable products.	7	2,43	0,98
Our enterprise purchases biodegradable packaging materials.	7	2,43	0,98
Our enterprise purchases biodegradable auxiliary materials/accessories.	7	2,14	1,07
Our enterprise purchases recycled chemicals.	7	1,86	1,07
Our enterprise purchases biodegradable chemicals.	7	1,86	1,07

Almost all of the suppliers of the participating clothing enterprises participate in the implementation of eco-friendly processes (Table 2). Besides, most of the suppliers use eco-friendly materials, cooperate in order to decrease the usage of environmentally hazardous materials at production processes, cooperate in order to decrease the industrial wastes, cooperate during eco-label implementations, cooperate during eco-friendly packaging implementations, cooperate during eco-friendly marketing implementations, cooperate in order to decrease energy and water consumption and cooperate during the reuse and recycling of materials. This situation constitutes both a reason and a result of the long-term cooperation between the suppliers and the participating enterprises.

Table 2. Distribution of participating clothing enterprises according to green supplier elements

	N	Mean	Std. Deviation
Our suppliers participate in the implementation of eco-friendly processes.	7	4,71	0,76
Our suppliers use eco-friendly materials.	7	4,43	0,98
Our suppliers cooperate with us in order to decrease the usage of environmentally hazardous materials at production processes.	7	4,43	0,98
Our suppliers cooperate with us in order to decrease the industrial wastes.	7	4,14	1,07
Our suppliers cooperate with us during eco-label implementations.	7	4,14	1,07
Our suppliers cooperate with us during eco-friendly packaging implementations.	7	4,14	1,07
Our suppliers cooperate with us during eco-friendly marketing implementations.	7	4,14	1,07
Our suppliers cooperate with us in order to decrease energy consumption.	7	4,14	1,57
Our suppliers cooperate with us in order to decrease water consumption.	7	4,14	1,57
Our suppliers cooperate with us during the reuse and recycling of materials.	7	4,14	1,57

Table 3. Distribution of participating enterprises according to green supplier selection criteria

	N	Mean	Std. Deviation
Our enterprise follows its suppliers' products and processes in terms of environmentally hazardous materials.	7	5,00	0,00
Environmental factors are taken into consideration by our enterprise during supplier selection.	7	4,43	0,98
Our enterprise notifies its environmental requests to its suppliers in written.	7	4,43	1,51
Our enterprise follows its suppliers' environmental performance.	7	4,43	0,98
Our enterprise requests its suppliers to possess an environmental management system.	7	4,14	1,07
Our enterprise provides necessary support (financial support, seminars for awareness increment, education and training etc.) to its suppliers for environmental performance improvement.	7	3,29	1,80

Table 4. Distribution of participating clothing enterprises according to the gained advantages with green purchasing implementations

	N	Mean	Std. Deviation
Corporate image is improved.	7	4,29	0,76
Enterprise awareness is increased.	7	4,00	1,15
Customer relations are improved.	7	3,86	0,90
Productivity is increased.	7	3,29	1,60
Customer portfolio is enriched.	7	3,29	1,38
Turnover is increased.	7	3,14	1,07
Profitability is increased.	7	3,00	1,41
Costs are reduced.	7	3,00	1,53

All participating clothing enterprises follow its suppliers' products and processes in terms of environmentally hazardous materials (Table 3). Besides, most of the enterprises select their suppliers according to environmental factors, notify their environmental requests to their suppliers in written, follow their suppliers' environmental performance, request their suppliers to possess an environmental management system and provide necessary support to their suppliers for environmental performance improvement.

According to the obtained results, enterprises pay attention to select green suppliers, which

constitutes an important part of green purchasing process. Within the context of green purchasing process, clothing enterprises follow their suppliers' products and processes in terms of environmentally hazardous materials. Besides, they follow their suppliers' green implementations and they request them to provide continuance. In addition to these, they provide necessary support when it is needed.

According to the participating clothing enterprises, the most important advantage they gained by implementing green purchasing is the increment in corporate image (Table 4). This advantage is followed by enterprise awareness increment, customer relations improvement, productivity increment, customer portfolio enrichment, turnover increment, profitability increment and cost reduction respectively. Averages of cost reduction and profitability increment are comparatively low because, green purchasing processes relatively increase costs in short-term. However, these advantages contribute to consistent market formation and enterprise survival in long-term.

5. Results and General Evaluation

Nowadays, processes and products change rapidly due to the globalization and technology and new trends appear every day. Clothing sector is one of the sectors where this alteration and speed are mostly felt because it includes fashion concept in which alteration is very effective. Therefore, clothing enterprises use different methods in order to increase their competitiveness and differentiate from their rivals. Green purchasing/supply, which constitutes a significant part of green supply chain management, is one of the commonly used methods which can be implemented for this purpose.

Within this context; the clothing enterprises purchase eco-friendly (natural), recycled, biodegradable and eco-labeled raw materials, products, auxiliary materials/accessories, chemicals and packaging materials in order to implement green purchasing elements. According to our research results, they frequently purchase eco-friendly raw materials, materials and products whereas they rarely bought biodegradable raw materials, materials and products. Besides, they purchase green power (electricity which is obtained from renewable energy resources such as biogas, bio-fuel, geothermal energy, solar energy, wind power and water energy) as far as possible. As it can be seen, clothing enterprises generally purchase eco-friendly and sustainable raw materials, materials, products and energy within green purchasing context.

According to another result of the research, clothing enterprises work with many suppliers and they aim to establish long-standing cooperation with their suppliers. In this context, enterprises pay attention to select green suppliers, which constitutes an important part of green purchasing process. They follow their suppliers' products and processes in terms of environmentally hazardous materials and they request them to provide continuance. In addition to these, they provide necessary support when it is needed.

On the other hand, enterprises have applied to environmental certification bodies in order to certify their possessed green elements. The possessed environmental certifications and standards enrich enterprises' customer portfolios and increase their recognition and corporate image.

The most important advantage, which is gained by participating clothing enterprises via implementing green purchasing, is the increment in corporate image. Besides; their enterprise awareness is increased, customer relations are improved, productivity is increased, customer portfolios are enriched, turnover and profitability are increased and costs are reduced.

To sum up, green purchasing processes increase clothing enterprises' competitiveness and differentiate them from their rivals. Within this context, green purchasing/supply, which constitutes a significant part of green supply chain management, is one of the desirable gold keys for clothing enterprises.

References

[1] Eltayeb T.K., Zailani S., Jayaraman K., 2010, The examination on the drivers for green purchasing adoption among EMS 14001 certified companies in Malaysia, Journal of Manufacturing Technology Management, 21(2):206-225
[2] Younis H., Sundarakani B., Vel P., 2016, The impact of implementing green supply chain management practices on corporate performance, Competitiveness Review, 26(3):216-245
[3] Lo S.M., Shiah Y.A., 2016, Associating the motivation with the practices of firms going green: the moderator role of environmental uncertainty, Supply Chain Management: An International Journal, 21(4):485-498
[4] Weisstein F.L., Asgari M., Siew S.W., 2014, Price presentation effects on green purchase intentions, Journal of Product & Brand Management, 23(3):230-239
[5] Singh A., Trivedi A., 2016, Sustainable green supply chain management: trends and current practices, Competitiveness Review, 26(3):265-288
[6] Dubey R., Gunasekaran A., Papadopoulos T., 2017, Green supply chain management: theoretical framework and further research directions, Benchmarking: An International Journal, 24(1):184-218
[7] Br R.K., Agarwal A., Sharma M.K., 2016, Lean management – a step towards sustainable green supply chain, Competitiveness Review, 26(3):311-331
[8] Singh R.K., Rastogi S., Aggarwal M., 2016, Analyzing the factors for implementation of green supply chain management, Competitiveness Review, 26(3):246-264
[9] Hervani A.A., Helms M.M., Sarkis J., 2005, Performance measurement for green supply chain management, Benchmarking: An International Journal, 12(4):330-353
[10] Jaggernath R., Khan Z., 2015, Green supply chain management, World Journal of Entrepreneurship, Management and Sustainable Development, 11(1):37-47
[11] Hwang Y. D., Wen Y.F., Chen M.C., 2010, A study on the relationship between the PDSA cycle of green purchasing and the performance of the SCOR model, Total Quality Management & Business Excellence, 21(12):1261-1278
[12] Min H., Galle W.P., 2001, Green purchasing practices of US firms, International Journal of Operations & Production Management, 21(9):1222-1238
[13] Gonzalez-Benito J., Lannelongue G., Ferreira L.M., Gonzalez-Zapatero C., 2016, The effect of green purchasing on purchasing performance: the moderating role played by long-term relationships and strategic integration, Journal of Business & Industrial Marketing, 31(2):312-324
[14] Vijayvargy L., Thakkar J., Agarwal G., 2017, Green supply chain management practices and performance: the role of firm-size for emerging economies, Journal of Manufacturing

Technology Management, 28(3):299-323
[15] Rao P., Holt D., 2005, Do green supply chains lead to competitiveness and economic performance?, International Journal of Operations & Production Management, 25(9):898-916
[16] Mafini C., Muposhi A., 2017, The impact of green supply chain management in small to medium enterprises: cross-sectional evidence, Journal of Transport and Supply Chain Management, Available at: https://doi.org/10.4102/jtscm.v11i0.270
[17] Green K.W. Jr., Zelbst P.J., Meacham J., Bhadauria V.S., 2012, Green supply chain management practices: impact on performance, Supply Chain Management: An International Journal, 17(3):290-305
[18] Ahsan K., Rahman S., 2017, Green public procurement implementation challenges in Australian public healthcare sector, Journal of Cleaner Production, 152:181-197
[19] Mosgaard M.A., 2015, Improving the practices of green procurement of minor items, Journal of Cleaner Production, 90:264-274