



## Research Article

# Green Supply Chain Management Implementation in Turkey: Drivers, Outcomes and Sustainability

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## Abstract

**Objective:** Since one of the most argued and researched concern in supply chain research and practice is pros and cons of green understanding in supply chains and in their sustainability, this study aims to explore the drivers and outcomes of green understanding of Turkish companies and their supply chain sustainability. The scarcity of green research, especially in Turkey, takes the attention of this study.

**Methods:** The data is collected from Turkish companies, a part of supply chains located in Turkey from different industries, through a structured interview developed as a result of the derived points from the literature.

**Results:** The results suggest that (1) while laws, customers, government and global influencers are externally effective, corporate culture internally drives green supply chain management (GSCM) practices; (2) quality is the most apperant outcome of GSCM practices; and (3) environmental sustainability is a clear consequence of GSCM practices in terms of sustainability.

**Conclusion:** For increasing forces in adopting green practices, the results suggest building suitable organizational culture. The results also imply that GSCM practices increase firm competitiveness and economic performance.

**Keywords:** green supply chain management, drivers, benefits, sustainability

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## 1 INTRODUCTION

Industry 4.0 forces organizations become “open systems” since they need to be more dynamic, constantly changing and dependent on wider external environments<sup>[1]</sup>.

Besides the growing interest on green supply chain management (GSCM), its management is problematic especially in developing countries<sup>[2]</sup>. Moreover, developing countries do not eagerly want to employ it in their

operations because of some negative effects<sup>[3]</sup>. GSCM research needs to be enriched in developing countries<sup>[4]</sup>.

Since GSCM is less explored in emerging economies, the literature for those economies should be strengthened. In this study, we explore the drivers and outcomes of GSCM adoption of Turkish companies regarding their supply chain sustainability. The scarcity of research, especially in Turkey, takes our attention to run this research. Besides the green approach in the dimensions of supply chains such as logistics is analyzed in Turkey<sup>[5]</sup>, we haven't identified a comprehensive research on Turkish supply chains.

We will explore the following research questions:

RQ1: What factors influence the adoption of GSCM in Turkey?

RQ2: In what ways do the subject companies enhance their performance? and

RQ3: Which sustainability aspects of the investigated firms are improved after adopting GSCM?

It is expected that this research will contribute to the understanding of (1) Turkish firms while managing their supply chains; and (2) researchers in the context of developing countries. We assume that this research will be beneficial for the government and company management to see the necessary points regarding the employment of green understanding in supply chains.

We expect that the findings and implications of the study will be beneficial to the regional economy and research. Moreover, this work is original in that it asks the interviewees from Turkish companies to present their idea regarding the employment of GSCM.

In the rest of the paper, we provide the literature regarding GSCM, GSCM drivers, GSCM effect on company performance and sustainability performance. We also present the methodology section and the obtained results from interviewing Turkish manufacturing companies. Finally, we conclude the paper with the discussion of the findings.

## 1.1 GSCM

GSCM targets to reduce waste and to improve ecosystem quality, eco-efficiency, and material recycling process<sup>[6]</sup>. GSCM practically aims to achieve significant profits by leveraging environmental efficiency through technology, new equipments, supplier training programs, and allocation of employees<sup>[7,8]</sup>.

Companies adopt different GSCM practices, depending upon their characteristics<sup>[6]</sup>. The most common practices include green purchasing, internal environmental management practices, eco-design, customer collaboration on environmental concerns and end of life product

management<sup>[9,10]</sup>. Companies need to work collaboratively with their suppliers to enhance the benefits of GSCM<sup>[6]</sup>.

A research by Gong et al analyse Web of Science's citation database from 2007-2018 and identify that: (1) GSCM research is exponentially increasing, especially after 2013; (2) more recently, GSCM research mainly focuses on green production and innovation, GSCM theory and method, and sustainable supply chain environment and performance<sup>[11]</sup>.

According to Carter and Rogers, GSCM systematically coordinates key inter-organisational business processes to improve the long-term economic performance of the company and its supply chains through strategic, transparent integration and achievement of organisational social environment, and economic goals<sup>[12]</sup>.

The literature generally investigates one or some of different aspects of GSCM in a single study such as understanding product life cycle and the location of the organization in order to determine their GSCM orientation and practices<sup>[13]</sup>. While some studies evaluate GSCM with different dimensions<sup>[14]</sup>, we consider GSCM as a single construct.

## 1.2 GSCM Drivers

The increasing interest on environmental and ecological concerns such as industrial pollution, exhausting natural resources, global warming, and carbon emissions continuously influences the evolution of logistics and supply chain management<sup>[15]</sup>.

Especially the companies that cause environmental problems have had to review their production processes and supply chains<sup>[14]</sup>. Rising pressure of governments, customers and environmental organisations on firms causes adopting green understanding in their supply chains. We call this approach as GSCM through which companies can succeed on environmental transformation and contribute to a more equitable and sustainable economy<sup>[16,17]</sup>.

Emerging circular economy encourages using resources efficiently to extract maximum value and also drives GSCM which includes practices regarding purchasing, manufacturing, distribution, consumption and recycling of resources and end-of-life-management of products<sup>[17]</sup>. So, GSCM includes all eco-friendly supply chain practices from purchasing the materials to the end of product's life cycle<sup>[18,19]</sup>. Therefore, we expect to achieve enhanced economic performance and financial savings through GSCM with suppliers, customers and other supply chain partners.

Companies care about their environmental impacts as a result of pressures from customers, regulators and competitors<sup>[3,19-22]</sup>.

Regulatory forces directly influence GSCM practices adoption<sup>[13]</sup> since there is no way out for the companies which want to exist without punishment in that environment. Company motivation changes from one country to another. While Japanese companies implement GSCM practices mainly due to domestic pressure, Chinese companies feel international pressure as the main influencer<sup>[13,23,24]</sup>. Regulatory bodies, mostly in developing countries, greatly promote green practices<sup>[13,25]</sup>.

Customer and market demands and their growing eco-friendly expectations are also among the main drivers of adopting GSCM<sup>[3]</sup>. Many US consumers made purchasing decisions by considering eco-friendly products and are willing to pay more for them<sup>[26]</sup>. Therefore, customers and regulatory bodies force the companies to set and adopt environmental strategies<sup>[27,28]</sup>.

The influencing factors of GSCM are also called as pressures; or drivers<sup>[21]</sup>. For example, manufacturing companies feel the pressures of the society, customer and government bodies to adopt green practices<sup>[29]</sup>. The drivers for environmental concerns include legal pressure, consumer awareness, human resources, top management and company inter-function collaborations<sup>[30]</sup>. The literature reports that government policies and regulations, global competitiveness, and customers are among the most influential drivers<sup>[21]</sup>. Zhu et al. identify that institutional pressures impact the adoption of internal GSCM practices<sup>[9]</sup> too. In another study, the force of regulative pressure, market pressure, supplier pressure and internal pressures are important for GSCM adoption<sup>[19]</sup>.

Some other reasons of adopting GSCM initiatives include financial reasons, stakeholder and customer demands, competitive advantage, environmental and social groups, and reputation loss<sup>[27,31,32]</sup>.

### 1.3 Organizational Culture and Green Practices

Beside the literature strongly suggests the strong impact of corporate culture on GSCM adoption to increase performance and sustainability<sup>[33]</sup>, the literature fairly investigates and provides evidence about the influence of cultural factors<sup>[15]</sup>.

Organizational culture is a great enabler of green suppliers<sup>[34]</sup>. Besides various dimensions of organizational culture<sup>[35,36]</sup> it is also considered as a single variable<sup>[37]</sup>.

Moreover, management support and commitment are suggested in managing GSCM practices and resources<sup>[38,39]</sup>.

### 1.4 GSCM and Performance

Companies are not sure about whether implementing GSCM worthy or not since it is not an easy task; and it requires substantial resource and commitment<sup>[13]</sup>. Though GSCM leads to enhanced environmental performance (EP), reduced costs and lessened disruption and reputational risk,

the results are still not clear<sup>[19]</sup>.

Although adopting GSCM is costly, the literature reports its positive impact on firm performance too<sup>[40,41]</sup>. The literature presents mixed results about the impact of GSCM on performance: (1) Positive relationships<sup>[19,42,43]</sup>, (2) negative relationships<sup>[44]</sup> and (3) no relationship<sup>[29]</sup>. The applied contexts (e.g. national regulations and industry type and market) may provide different results<sup>[45]</sup>. Some works also report the indirect effect of GSCM on performance. For example, GSCM influences firm performance through green innovation<sup>[46]</sup>.

Firm performance is a multidimensional concept which has three indicators regarding the growth rate of company profits: Production, finance, and marketing<sup>[13]</sup>. GSCM can help companies in (1) reducing raw material costs by using recycled materials which will increase profits and advance firm performance<sup>[13]</sup>, (2) developing competitive advantage and financial performance in the long term<sup>[47]</sup> and (3) improving supply chain efficiency and competitiveness<sup>[48]</sup>.

The literature reports that customers in 1995 can pay 13 percent more for eco-friendly products<sup>[49]</sup>. Some practices such as green marketing and consumer segmentation are useful in reaching customer cooperation on environmental concerns in order to integrate environmental aspects into the supply chain<sup>[50]</sup>. Companies have various corporate motivations to adopt GSCM such as economic benefits and improving brand image and name<sup>[13]</sup> as well as their environment-friendly image and competitive capability<sup>[43]</sup>. Therefore, companies aim to improve their environmental image and customer satisfaction, besides the increase in economic performance<sup>[51]</sup> through active engagement with customers<sup>[9]</sup>.

In their study, Abdallah and Al-Ghwayeen identify positive influence of GSCM on EP and operational performance but negative impact on business performance<sup>[52]</sup>. The literature provides mixed results regarding the impact of GSCM on performance whether environmental, financial or operational<sup>[23,53]</sup>. Therefore, new results, especially from the industry professionals, are extremely important in clarifying the issue.

Researchers consider business performance from different perspectives including (1) effectiveness, efficiency and adaptability<sup>[54]</sup>; (2) complexity, lifestyle, and competitive advantage<sup>[55]</sup>; (3) financial indicators (i.e. total sales and growth rate of sales), non-financial indicators (i.e. market share and stock age) and employee productivity<sup>[56]</sup>; and mostly (4) profitability, increase of market share, sales growth rate, and customer satisfaction<sup>[57-60]</sup>. For example the impact of GSCM practices on SC performance in automotive industry is determined by quality, customer satisfaction, and efficiency<sup>[61]</sup>.

Because of mixed outcomes, more investigation is suggested on the impact of GSCM<sup>[23,43,62-64]</sup>.

### 1.5 GSCM and Sustainability

United Nations General Assembly suggests sustainability for both the future and the present capability of the firms<sup>[65]</sup>. It has three dimensions including the activities about the social and environmental impacts of a company while supporting its financial infrastructure. However, companies may not consider sustainability because of its long-term nature. The literature is weak in examining sustainability of supply chain management especially for emerging economies.

GSCM is suggested in enhancing organizational sustainability<sup>[64,66-68]</sup>. GSCM practices have impact on the three dimensions of sustainability (economic, environmental and social)<sup>[41]</sup>. While the literature mainly focuses on economic performance and EP, it fairly investigates the social performance<sup>[14]</sup>.

The literature reports different results about GSCM impact on ecological-economic performances and business sustainability<sup>[69,70]</sup> besides the well supported effect on EP<sup>[71]</sup>.

EP considers the environmental impact (released hazardous waste, air, water and soil) of organizational activities (production, transportation, procurement and the product)<sup>[72]</sup>. GSCM practices reduce the consumption of wastes and harmful substances, the incidence of environmental accidents and improve community health<sup>[53]</sup>.

Green policy commencement significantly and directly influences the environment<sup>[73-75]</sup> and economic performance<sup>[42,76]</sup>.

The literature reports positive effect of GSCM on EP<sup>[41,42,64,77,78]</sup> and on cost performance<sup>[41,64,79]</sup>. The GSCM also improves environmental efficiency, reduces costs and saves money<sup>[19,42,80]</sup>.

Economic performance is about the manufacturing capability in reducing costs of purchased materials, energy, waste, and danger of environmental accidents<sup>[64]</sup>.

The scholars have different opinions about the costs associated with GSCM practices. Some agree that they have no impact on costs such as Bowen et al., while others state that they have negative effect on financial performance<sup>[76]</sup>.

Regarding the economic performance, Hart suggests the positive impact of GSCM on economic performance in two ways (1) direct gain by reducing waste and energy costs and (2) indirect benefits by enhanced customer loyalty and corporate reputation<sup>[81,82]</sup>. The literature, in general, suggests the positive impact on economic performance<sup>[26,42,45,83]</sup>. GSCM practices also improve the efficiency of resources related to economic performance<sup>[13,41,42,84]</sup>.

Social performance is about considering and taking necessary actions about social responsibility of the firm including social projects, well-being of all stakeholders and equal opportunities for all personnel<sup>[14]</sup>. Social performance is not well studied by the scholars.

The literature also suggests various impacts of each dimension on the other dimensions. Choudhary and Sangwan identify that the adoption of green practices improves environmental and operational performances but reduces economic performance<sup>[85]</sup>. Gopal and Thakkar find that EP and social performance positively influence economic performance<sup>[86]</sup>. According to Azevedo et al., there is a connection between EP and economic performance<sup>[61]</sup>. EP enhances economic performance<sup>[87]</sup> and the environment image and sales/profits over the long term<sup>[13]</sup>. The literature also provides contradictory results regarding environmental management and economic performance<sup>[88,89]</sup>.

Therefore, we assume that after GSCM in their respective supply chains, companies become sustainable in three aspects of sustainability (economic, environmental and social).

### 1.6 GSCM Literature in Turkey

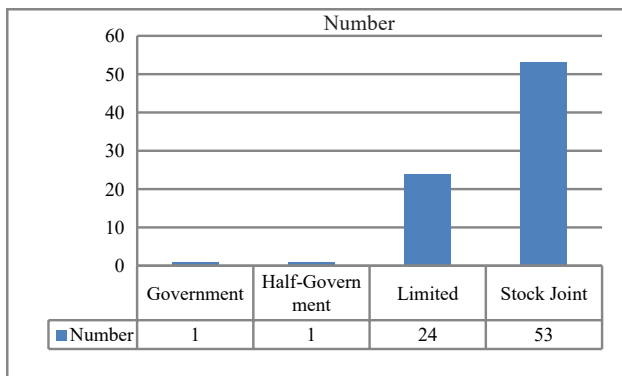
Given that supply chain literature in developing countries is weak in considering eco-approaches in business<sup>[5,90,91]</sup> Turkish literature is also weak in studying green practices regarding supply chain sustainability and only evaluates some aspects of the issue such as green supplier selection and green performance<sup>[5,90,92]</sup>. While preparing literature review, we observe few studies regarding GSCM conducted in Turkey.

Koca and MathiYazhagan search the barriers regarding the social dimension in Turkey and identify that (1) stakeholders' negative influence, (2) lack of culture without engagement and support, and (3) ignoring the rights of stakeholders are the most important barriers<sup>[21]</sup>. They state that there are no studies concerning the barriers of the social dimension of supply chain sustainability in Turkey and most research concentrates on the barriers of GSCM in the environmental dimension of supply chain sustainability in Turkey. In another research, Behdioglu and Koca identify that the barriers encountered during the GSCM initiatives in the Turkish automotive industry are implementation costs, lack of information, insufficient environmental awareness<sup>[93]</sup>. According to Kiris and Borekci, while drivers in sustainable port systems focus on environmental sustainability issues, barriers focus on economic sustainability issues<sup>[94]</sup>.

Since publishing sustainability reports regarding supply chain sustainability is not mandatory in Turkey, few companies prepare this report<sup>[95]</sup>.

Yılmaz et al. analyse the attitude of departmental managers towards eco-labels in sustainable tourism chains in Turkey and identify that (1) managers' attitude towards eco-





**Figure 1. Interviewed Companies.**

labels change according to their personal and professional characteristics; and (2) sustainable management and operation activities of the hotels change significantly according to their eco-labeled certification<sup>[96]</sup>.

In another Turkish research, Yurdakul and Kazan identify that eco-innovation directly influences pollution prevention, resource saving and recycling; it has indirect positive impact on cost reduction and therefore on economic performance<sup>[65]</sup>.

In terms of public disclosure of environmental information and its effect on financial performance, Kalash identify weak impact of environmental disclosure on the financial performance of Turkish firms. He reports that the literature weak in studying environmental disclosure impact on financial performance in Turkey<sup>[97]</sup>.

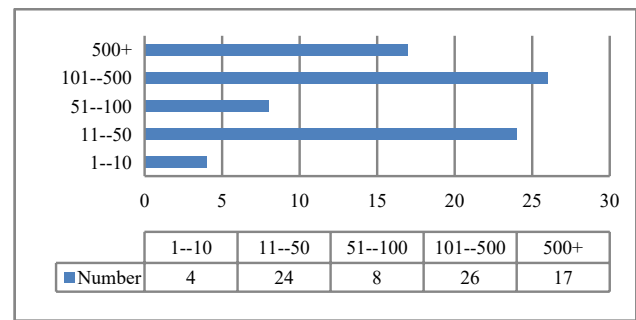
## 2 MATERIALS AND METHODS

We preferred a structured interview as the data collection method in this study. We used the points appeared at the end of the literature review while developing the interview questions. Since the interviewees speak Turkish, Turkish is the chosen language of communication. The interview includes sections to see the respondents' idea about (1) GSCM adoption in their companies, (2) the influential forces for adopting GSCM, (3) the impact of GSCM on company performance and (4) on sustainability.

We choose convenient sampling while determining the target companies from different industries and visit the companies, in Turkey, from various supply chains. We do not consider subject companies regarding the nature of their supply chains (global, regional, or local supply chains) or regarding their industries.

The interview does not aim to identify the types of applied GSCM practices. We target the companies which have more than 10 employees. All managers who might know GSCM and their supply chains are in the determined group.

Interviewing is completed by face-to-face conversations. We do not explain interview questions to the interviewees in order to prevent biasing. Anonymity of the interviewees and the companies are guaranteed to boost their contribution



**Figure 2. Interviewed Companies' Size.**

and willingness. Interviews are recorded by using mobile phones. Each interview is completed around half an hour. We found proper to use percentage frequency distribution of the responses while envisioning the findings by (1) counting the positive answers and (2) calculating their percentages. Percentage frequency distribution provides concise display of the data<sup>[69]</sup> and timely and reliable information about the situation.

## 3 RESULT AND DISCUSSION

### 3.1 Demographics

After the interview period, we got 79 interviews with company representatives from 79 different Turkish manufacturing companies. They operate in various industries in 23 different Turkish cities. The average age of interviewees is 39.26 and they are generally male (68/79). The majority of the interviewees have bachelor degree (1 PhD degree; 14 master degree; 50 undergraduate degree; and 14 other). They are experienced enough to know their working environment (with the average of 14.51 years).

There are 24 limited companies, 53 stock joint companies, one governmental institution and one half-governmental institution in the sample space (Figure 1). All of them are manufacturers.

We generally reach to the companies with more than 10 employees (Figure 2). There are 4 companies with less than 10 employees. While the sample mainly consists of SMEs (77%), it also includes some large companies (23%).

### 3.2 GSCM Implementation

Results of the interviews provide that 8 of the companies do not implement GSCM practices due to their incapacabilities (Table 1). However, they state their positive intentions to implement them when they become able to. Some of their comments are below: "...We cannot apply GSCM practices by our own decision and capabilities. Regional authority and supply chain partners are influential in applying them." "... Since it is a big cost for our company, we cannot afford it."

The companies mainly adopted GSCM and most of them state their willingness to improve their positions and practices. "...We are applying green practices in our supply chain and want to enhance it by using railways instead of highways."

**Table 1. GSCM Implementation**

GSCM Implementation	Number
Implemented	66
Half implemented	5
Does not exist	8

**Table 3. Outcomes of GSCM Practices**

Outcomes	Number	Percentage
Cost Reduction	20	0,25
Customer Relationships	26	0,33
Efficiency	26	0,33
Effectiveness	16	0,20
Asset Increase	11	0,14
Quality	49	0,62
Time Management	15	0,19
Innovativeness	25	0,32
Price Management	19	0,24
Flexibility	11	0,14
Supplier Relationships	35	0,44
Market Share	35	0,44
Collaborations	14	0,18

“...We aim to reach sustainability of our business by adopting green practices.” “...We believe that classical ways and old methods will leave their position to green understanding by the time. New generation and new business understanding will require this adoption. It is the future’s prerequisite.” “...We regularly meet with our suppliers and revise our methods. We also arrange seminars in order to train ourselves and our partners.” “...We must adopt GSCM practices to sell our product.”

### 3.3 Drivers of GSCM

According to the interviewees’ comments, we observe that the most agreed driver is the laws (81%) followed by customers (62%), government (61%), global influencers (61%) and corporate culture (58%) (Table 2). They moderately agree that suppliers, market and competitors are influential in adopting green practices. It is interesting to see that they fairly agree that shareholders drive the adoption of green practices. The reason for that may be the cost factor of adopting green practices. They may have resistance to employ GSCM because of cost related difficulties.

One interviewee says that “...Since we work with international partners and they strictly follow Green practices, we must employ them in our supply chain. Moreover, we need to be more responsible to the environment.”

We may conclude that despite the weak intensions of company shareholders, Turkish companies employ GSCM practices due to the external forces (laws, government, customers, and global influencers) and they are capable of

**Table 2. Drivers of GSCM**

Drivers of GSCM	Number	Percentage
Corporate Culture	46	0,58
Suppliers	37	0,47
Government	48	0,61
Laws	64	0,81
Market	37	0,47
Customers	49	0,62
Shareholders	25	0,32
Global Influencers	48	0,61
Competitors	37	0,47

**Table 4. Sustainability after GSCM**

Sustainability Dimensions	Number	Percentage
Economic Sustainability	35	0,44
Environmental Sustainability	48	0,61
Social Sustainability	29	0,37

adopting them with the help of their corporate culture (Table 2).

### 3.4 Benefits of GSCM

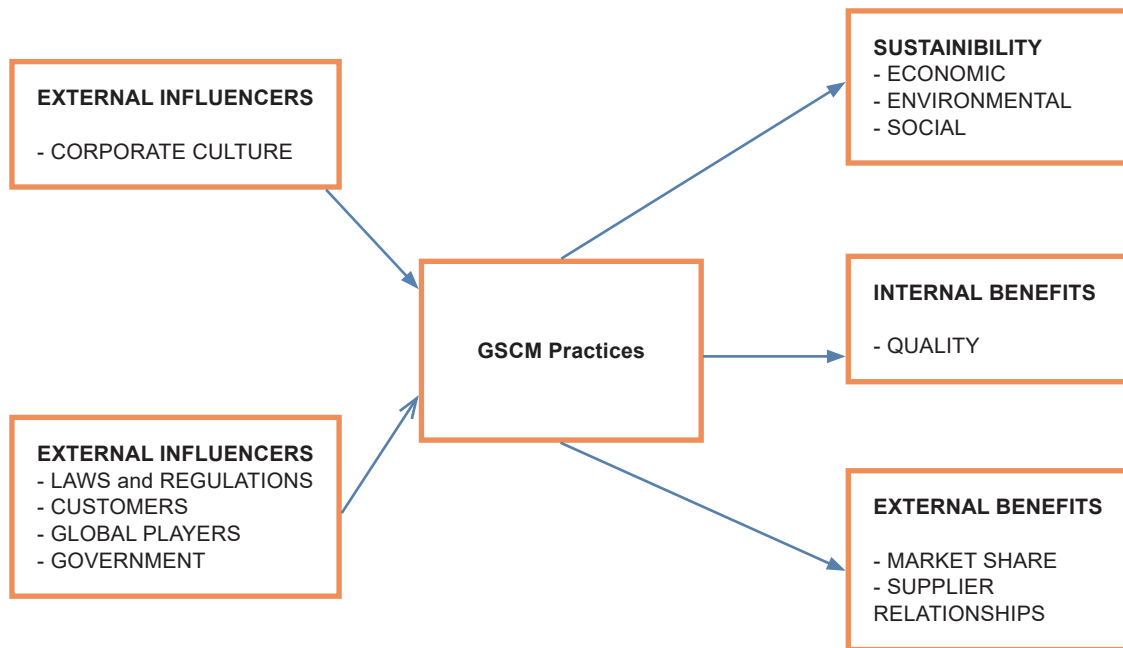
As a result of interviews, we see that the quality (62%) is the most agreed performance outcome after GSCM implementation. The interviewees also believe that supplier relationships (44%) and market share (44%) are increased by GSCM (Table 3). One third of the interviewees approve that customer relationships, efficiency and innovativeness increase as a result of GSCM understanding.

They fairly consider collaborations and flexibility as the outcomes of GSCM. This may be because of suppliers’ unwillingness for GSCM. Another reason for that may be they could not be flexible enough to adapt their mechanisms for GSCM practices.

They also seem to disagree to the rest of the possible outcomes such as cost reduction, asset increase, time management, and price management. Some of the interviewees’ comments are below: “...Despite GSCM practices increase the costs, we need to be sensitive to the environment.” “...Even though it is a cost for our business, in the long run, it will reduce the costs. Moreover, it is a direct investment for customer relationships.” “...GSCM Practices are useful for our company since we can get maximum benefits from our waste products.” “...It increases our share in the market.”

### 3.5 Supply Chain Sustainability

Sustainable supply chain management (SSCM) integrates economic, social, and environmental concerns into the supply chain practices<sup>[15]</sup>. In line with the literature, the interviewees believe that they achieve environmental sustainability after applying GSCM practices (Table 4).



**Figure 3. Proposed Research Model.**

They also agree that their companies have economic sustainability as a result of GSCM practices. However, social sustainability seems to have a low level of agreement (Table 4).

One of the interviewees says that “...GSCM practices provide benefits in the long term.”

We could assume that companies achieve benefits as a result of GSCM practices in the long term even though it seems costly in the short term. Therefore, they can sustain their business (economic sustainability).

In terms of social sustainability of the firm, an interviewee comments that “...GSCM Practices help to increase our social image.” “...GSCM increases our costs. However, it is our responsibility to the environment and social life.”

### 3.6 Suggested Effective GSCM Model

Based on the findings of the study, we can propose relationships among the identified variables. Future research may consider this model to provide stronger clues about the relationships (Figure 3).

## 4 CONCLUSION

This study explores the drivers and outcomes of GSCM practices in Turkish companies regarding their supply chain sustainability. We mainly identify that (1) while external drivers are laws, customers, government and global influencers, corporate culture is the main internal driver of GSCM practices; (2) achieving quality is the most apparent outcome which followed by increased supplier relationships and market share; and (3) regarding sustainability, environmental sustainability is a clear result of GSCM practices.

The results confirm the increasing trend for GSCM

practices around the world. This trend forces organization adopt green understanding<sup>[98]</sup>. In order to facilitate the adoption, governments support them by simplifying the process with established laws and regulations. As Zhu et al recommended, governments should improve the public awareness and make future legislations transparent to the organizations<sup>[13]</sup>.

Besides this, organizations can accelerate the adoption by building suitable organizational culture as suggested by the results. They may organize events for their employees and explain the environmental, operative and economic advantages of green practices. As the literature advises, they may invest on technological upgradation, environmental-friendly raw materials/resources and personnel training<sup>[13]</sup>.

The literature reports that GSCM practices minimize costs (manufacturing, material and distribution, logistics and warehouse) by improving the product quality. Scholars recommend that GSCM enhances operational capabilities without decreasing customer satisfaction and product quality<sup>[61]</sup>. According to our results, Turkish companies perceive that the quality can be achieved through GSCM practices too. However, they believe that it is costly. The literature also suggests that GSCM initiatives improve firm competitiveness and economic performance<sup>[98]</sup> as identified by our study.

According to the results, we may imply that GSCM practices increase organizational comfort regarding their manufacturing conditions since customers, one of the external stakeholders, have strong wish to understand the conditions<sup>[99]</sup>.

Given that the literature reports mixed results regarding

GSCM use and its effect on performance, this study clarifies the issue more for Turkish literature<sup>[5,21,100,101]</sup>. We see that Turkish companies such as Arkas Holding and Paşabahçe have implemented green practices in their logistics and they have improved their performance. However, they have not implemented green practices in their supply chains yet. Arkas Holding has taken significant steps in green logistics<sup>[101]</sup>. The company uses Euro 5 standard vehicles for land transportation and practices fuel-saving techniques by operating ships at economical speeds. Additionally, Arkas Holding has implemented projects like the Arkas Forest and green IT initiatives to further its commitment to environmental sustainability<sup>[101]</sup>. On the other hand, Paşabahçe focuses on energy efficiency and reducing greenhouse gas emissions. By optimizing air-fuel ratios in furnaces and consolidating fans, the company has achieved substantial energy savings and reduced natural gas consumption by 20%. They have also developed industrial water cooling systems to cut down on electricity usage.

This study is among the few studies regarding the use of GSCM practices in Turkey. Therefore, we expect that this research will be beneficial especially for Turkish academic research and industry. Since Turkish literature is weak on this point, we did not analyse the issue in depth and preferred to view the generic picture. Therefore, we did not consider specific industries or specific members (e.g. suppliers, producers, etc.) of supply chains. We took a big initial step so that future studies may explore further issues based on the findings of this study.

#### Acknowledgements

Not applicable.

#### Conflicts of Interest

The authors declared no conflict of interest.

#### Author Contribution

Özlen MK was responsible for the collection, compilation and summary of all data for articles.

#### Abbreviation List

EP, Environmental performance

GSCM, Green supply chain management

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