

The role of cultural factors in green supply chain management practices: a conceptual framework and an empirical investigation

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Abstract

Purpose – The purpose of this study is to contribute to the debate on the impact of organizational culture and national culture on green supply chain management (GSCM) adoption by empirically testing the developed framework, and ultimately pave the way toward potential areas for future research.

Design/methodology/approach – Using survey data from a sample of Moroccan manufacturing firms, 130 responses were collected and analyzed using SPSS 25 and Smart PLS v 3.3.3 software. The paper used a convenience sample, as it is required by the quantitative method, which legitimate making generalization under certain conditions.

Findings – The research results indicated that the national culture does not influence the GSCM implementation. The results contradict a number of prior works. As for the second direct effect measured postulated that organizational culture has a direct and significant impact on the GSCM. The results indicate that adhocracy culture, clan culture and hierarchical culture have a positive impact on the implementation of GSCM initiatives. To assess the impact of ownership type on GSCM, we underlined the difference between local and foreign firms. In fact, as argued, the foreign firms are more implementing GSCM initiatives than local firms do. Based on the arguments advanced on prior literature, the firm size does, as expected, exert significant control over the adoption of GSCM initiatives.

Research limitations/implications – The paper here is a starting point to understand how environmental sustainability and culture are interlinked; further research might contribute to this topic by empirically testing the model in similar or different contexts, using different cultural frameworks.

Practical implications – The practical implications for the paper are related to the necessity of adopting adequate organizational culture to build responsible behaviors for GSCM adoption by Moroccan firms. Recognizing the powerful role of organizational culture as a crucial factor responsible for GSCM's success beyond the well-defined corporate strategies, including market presence and technological advantages, etc.

Social implications – This paper contributes to the establishment of codependent links between sociology and management fields as it helps to update the social theories present in the operations management area.

Originality/value – To the best of the author's knowledge, few works have pursued to review and bridge cultural theories with the GSCM implementation.

Keywords Green supply chain management, National culture, Organizational culture, Quantitative survey, Developing countries

Paper type Research paper



1. Introduction

In light of the increasing interest toward sustainability within the supply chain levels, the concept of sustainable supply chain management (SSCM) has been developed. Within the literature, there are numerous definitions of the SSCM. [Carter and Rogers \(2008\)](#) define SSCM as:

The strategic, transparent integration and achievement of an organization's environmental, social and economic goals in the systematic coordination of key inter-organizational business processes for improving the long-term economic performance of the individual company and its chains (p. 368).

According to [Seuring and Müller \(2008\)](#), the SSCM is defined as:

As the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all the three dimensions of sustainable development i.e. economic, environmental and social, into account which are derived from customer and stakeholders requirements (p. 1700).

In recent years, there has been a growing recognition of the urgent need to address environmental sustainability in various industries. One area that has gained significant attention is supply chain management. Traditionally, supply chain management focused primarily on optimizing the flow of products and services from raw material suppliers to end consumers. However, the adverse environmental impacts associated with traditional supply chain practices have compelled organizations to adopt a more sustainable approach known as green supply chain management (GSCM).

GSCM integrates environmental considerations into all stages of the supply chain, from product design and sourcing to manufacturing, logistics and end-of-life disposal. Its primary objective is to minimize the ecological footprint and promote sustainable practices throughout the entire supply chain network. GSCM literature recognizes that environmental responsibility is not only a moral obligation but also a strategic imperative for businesses operating in an increasingly environmentally conscious world linked to large topics such as green knowledge management, green innovation, adopting blockchain technology and green performance with profitability (i.e. [Abbas & Khan, 2023](#); [Al-Hakimi et al., 2022](#); [Borazon et al., 2022](#); [Hong et al., 2022](#); [Istriari & Murwaningsari, 2023](#); [Long et al., 2023](#); [Rizzi et al., 2023](#)).

The academic interest of the present research is to add academic evidence of how cultural factors influence the implementation of green supply chain initiatives and empirically close the research gaps. Therefore, the main objective of this paper was to investigate the relationship between organizational, national cultures and GSCM implementation in the manufacturing industry of Morocco. Our research question is a relationship question that is concerned with examine three variables: What is the impact of national culture and organizational culture on GSCM practices? Methodologically, the study used a quantitative Web-based survey. Ultimately, our contribution in this paper was twofold, assessing the direct effects between national culture, organizational culture and GSCM, and assessing the control variables' role on GSCM levels of implementation to ascertain whether there is a relationship between the firms' characteristics and the application level of GSCM initiatives.

While various studies have examined the impact of formal institutions on GSCM (e.g. [Chu, Wang, & Lai, 2018](#); [Delmas & Toffel, 2004](#); [Dubey et al., 2015](#); [Saeed et al., 2018](#); [Sinha & Akoorie, 2010](#)), the paucity of works dealing with informal institutions and how they shape GSCM implementation motivated our thesis. Ultimately, we mobilized the institutional theory and competing value framework (CVF) as well as the RBV theory.

Our paper is structured as follows. Section 2 reviews the relevant literature surrounding the research topic. Section 3 describes and justifies the methodology used in this article.

Section 4 discusses the findings of the study. Finally, Section 5 revisits the research objectives and summarizes the findings of this study with research limitations and recommended future directions.

2. Literature review

2.1 National culture

Ever since, it was coined in the late 1980s, the national culture is defined as “the collective programming of the mind, which helps to distinguish the members of one group from those of another” (Hofstede, 1980, p. 25). Schwartz (1994) defined values as “desirable trans situational goals, varying in importance that serve as guiding principles in the life of a person or other social entity” (p. 21). This brings us to the national culture different models that exist in the literature, namely, the project of Hofstede (1980), Lloyd, & Trompenaars, (1993), Schwartz Model (1999), T Hall (1960), the GLOBE project (2004) and Kluckhohn and Strodtbeck (1961).

In this paper, we are interested in the GLOBE project developed by House et al. (2001) based on Hofstede’s studies. This project maintained five dimensions from the Hofstede dimensional paradigm. Even though, the authors have changed the labels of some of them. For instance, power distance and uncertainty avoidance were kept with no changes. Collectivism was divided into institutional collectivism (INCOL), and in-group collectivism; long-term orientation has changed to future orientation, while assertiveness and gender egalitarianism (GE) substituted masculinity-femininity dimensions. Two more dimensions were added to the original five, namely, human orientation and performance orientation (PO). The GLOBE project used 18 scores in total, 9 dimensions for “As is” and 9 for “Should be.” The “As is” or cultural practices refer to the current perception of a specific culture, while the “Should be” values inform us about the aspirations that an organization wishes to hold and develop (Waldman et al., 2006). In particular, the GLOBE project differentiates between cultural practices “As is” and the cultural values “Should be” based on Segall et al. (1998), who suggested that culture should be measured as interpreted by its members and Kluckhohn and Strodtbeck (1961) who studied respondents’ values based on their reported ideal behaviors, respectively.

2.2 Organizational culture

Similar to national culture, the corporate or organizational culture (used in this paper as synonyms) is considered the glue that holds organizations and the foundation of organizational systems. Numerous studies have attempted to measure organizational culture. Subsequently, a large body of tools and instruments were developed for this reason, such as Hofstede et al. (1990), Harrison model (1993) and Cameron and Quinn (1989). In this paper, we adopt the CVF proposed by Quinn and Rohrbaugh (1981, 1983) and later adapted by Cameron and Quinn (1999, 2011) to determine the culture of an organization. The competing values framework is chosen to be a measurement tool of organizational culture for several reasons. Compared with other frameworks, the competing values framework is a widely used framework and the most recommended by scholars such as Chu et al. (2018); until today, it is used in a variety of organizational issues, including leadership, decision-making and strategic management. More importantly, the CVF classifies culture into two major dimensions, which are organized into four main clusters: internal/external orientation and flexibility/control orientation.

2.3 Green supply chain management

Srivastava (2007) had defined GSCM as:

Integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the customers as well as end-of-life management of the product after its useful life (p. 54).

The supply chain practices were defined as “the set of activities undertaken in an organization to promote effective downstream and upstream linkages of the SC” (Gorane & Kant, 2016, p. 2). The green supply chain practices refer to “the set of actions and decisions necessary to mitigate the negative impact on the environment deriving from the activities carried out by a 37 company” (Evangelista et al., 2017, p. 354). The term GSCP is commonly used in the literature and will be used to refer to the green supply chain practices throughout this paper. Partly due to the lack of a unified definition for GSCP (Vachon & Klassen, 2008), these practices have been widely identified in prior studies with various number of definitions and categorizations.

2.4 Research gaps

The key matter that arises from the literature assessment is that numerous studies focused on one aspect of culture, either the national culture or the organizational culture to influence the firms' response, to environmental sustainability issues. In spite of the reviews published so far, the national and organizational cultures are not studied sufficiently in the environmental management literature. More importantly, the interconnection between the national and organizational cultures remains highly fragmented in environmental sustainability literature. One reason for this fragmentation is that scholars study environmental sustainability from a one-dimensional level of culture at a time, either the organizational or the societal-national level at another. So far, this intersection has only been applied in the study of Durach and Wiengarten (2017), even if this work takes a different form from what is proposed in the present paper. Apart from Durach and Wiengarten (2017) there is a general lack of research in combining national and organizational culture with GSCM. Accordingly, there is a need for academic work in which the diverse conceptualization of culture can be integrated. Little doubt remains on the intensity of the uptake of environmental initiatives within the developing countries' industries, many efforts are needed to achieve a high level of clarity about the circumstances of investing in such initiatives. The impact of national culture at the same level of analysis as the corporate culture, drawing upon the managers' accounts within 93 developing countries, is empirically overlooked, which justifies the standing of our research. Importantly, the articles focusing on national culture use mostly Hofstede's framework, and among these papers, only the original four dimensions are mostly investigated, i.e. power distance, individualism, masculinity and uncertainty avoidance. That is to say, the other dimensions have not been tested nor analyzed due to their novelty, e.g. long-term orientation, indulgence/restraint, pragmatism/normativism, while the papers using the GLOBE project focus on all the dimensions.

2.5 Hypotheses development

The interaction between our basic constructs revealed specific hypotheses based on two major effects, the impact of national culture on the implementation of green supply chain initiatives (*H1*) and the impact of organizational culture on the implementation of green supply chain initiatives (*H2*). A detailed summary of the two sets of hypotheses and the subhypotheses is provided in the following:

- H1*. National culture influences significantly the green supply chain practices implementation.

3. Methodology

3.1 Research design

The culture literature endorses methodological dilemmas regarding accountability or nonaccountability of culture (Martin, 2002), among other debatable issues, e.g. subjectivity, generalization of results, etc. The use of qualitative methods based on participant observation was, for a while, the primary method of social researchers. However, several attempts to quantify culture can be traced further back in time. Daun (1988) demonstrated the necessity of quantitative studies approaching national culture, for instance. The difficulty of studying culture has been pointed out to devise an appropriate research paradigm, research design and suitable methodological instruments to accomplish the task and answer appropriately the research questions. This model requires validation using empirical data gathered through a Web-based survey questionnaire for the statistical testing.

This study aims to survey the Moroccan context based on the leading sectors of the Moroccan economy with a focus on the traditional polluting industrial sectors, namely, chemical, electronic, automobile, textile, aeronautics and the transportation sectors. Hence, the population of the study comprised 130 manufacturing and transportation firms. The unit of analysis is the firm, with the managers as the key informants. We focused on the top management since, according to previous works, the managers' role is relevant in shaping the corporate culture as well as determining the overall strategic directions of the firms (Chu et al., 2018).

3.2 Data collection

The survey questionnaire consisted of four sections. First, the national culture section, second, the organizational culture section. Third, the green supply chain initiatives, and fourth, the firms and respondents' information. In the first part of the questionnaire, the respondents were asked to identify the organizational values and practices they had perceived within their firms based on a seven-point Likert scale using the framework from House et al. (2004). Next, to measure the organizational culture, respondents were given four culture types that have been recognized as the dominant cultures developed by Cameron and Quinn (1989). The measurement of green supply chain practices is based on previous works (Zhu et al., 2011); this study adopted their method and measurement items. In the fourth and final section, the respondents were asked to give their demographic information (e.g. age, gender, employment level, seniority within the firm, etc.). For an appropriate understanding, the survey questionnaire underwent translation. The time-period of data collection was March to August 2020.

The project Globe was adopted to measure the construct of national culture. The items used were taken from House et al. (2004). These items were designed to obtain data about organizational cultural variables. Respondents were asked to rate the items on a seven-point Likert-type scale. For some scales, the response indicators ranged from 1, indicating high agreement to 7 indicating high disagreement. For other scales, the verbal anchors in the seven-point scale reflected the endpoints on a continuum (e.g. 1 = assertive, 7 = nonassertive). All culture scales, however, were seven-point scales. The items were written across the organizational level of analysis and across the two culture manifestations (As Is) and (Should Be) which makes it more suitable for our research aims. The responses to As Is questions

reveal the perceptions of middle managers concerning current practices in their organizations. The questions are based on value dimensions instead of preferred because what we need to know is what they currently held as values rather than utopian values away from the actual behavior (Dahl, 2002). The responses to “Should Be” questions reveal managers’ values with respect to what they believe relates to the practices in their organizations. The table grouping the items chosen to measure the three variables of the theoretical model with the control variables is in [Appendix 1](#).

3.3 Data analysis

The data analysis has been performed through two stages. First, an exploratory factor analysis is conducted, the collected data was input and analyzed using SPSS application 25.0. The set of constructs and their measurement items used are an in-depth review of literature. The data was analyzed in SmartPLS 3.

The Moroccan firms have been recently more interested in sustainability, facing escalating pressures from external and internal sources. The sample is composed of firms from different geographical areas (e.g. east, west and south) in different industries to maximize generalization and variability. The selection of the firms, which formed our sample, was based on collected information covering green logistics reporting from various data sources, including company websites, sustainability reports, websites of governmental and nongovernmental organizations and other sources. Several industries were represented, including agro-industry, automotive, aeronautics, wood and furniture, electronics and electricals, chemical industry, metal and mechanical, mining industry, packaging and conditioning, construction industry, cement, plastics industry and transportation sector. The sample firms included large, small and medium companies. To make our sample representative, we mainly included the target firms from different cities, as we take into consideration that the diverse industries selected might influence the study results.

The respondents were asked to state the type of firms’ ownership. Consequently, 64 entities are foreign subsidiaries (49.2%) purely international firms. We measured the firm size based on the number of employees. There are four types of enterprises in Morocco, namely, micro firms, small firms, medium firms and large firms. The majority of responding firms are large companies (49.3%; $n = 67$), the medium-sized companies represented 30% ($n = 40$), 17 are small firms (13%), with 6 micro firms (5%). Most firms participating in this study operate in the agro-industry (28%; $n = 44$), followed by the automotive industry (15%; $n = 26$), then aeronautics (8%; $n = 8$).

3.4 Reliability of measures

The reliability of national culture dimensions was calculated to ensure the constructs possess internal consistency. The national culture results for reliability are presented. The Cronbach’s alpha values are above the accepted value of 0.6 and generally range between 0.616 and 0.853.

The Cronbach’s alpha was carried out for organizational culture; the α of the organizational culture construct showed a value higher than 0.7 ($\alpha = 0.952$), which is generally accepted as satisfactory.

GSCM Similarly, for GSCM, the same approach of measuring reliability was adopted, which is the internal consistency reliability using Cronbach’s alpha. As the agreed lower value of α is 0.6 or 0.7, the GSCM reliability value was 0.970, which indicated high reliability.

3.5 PLS results

The factor loadings, as shown in the SPSS output for national culture, are 0.70 or higher, which indicates adequate convergent validity. However, it was deemed suitable to exclude some dimensions measuring national culture. The reasoning behind this may be due to the fact that the respondents may not have a clear understanding of the concept and multicollinearity issues in the original model. At first, there were nine dimensions in the conceptual model. However, after rotation, items have been deleted which eliminated three variables from a data set of PO, GE and INCOL. For more details, please check Appendix 2–4.

The Kaiser–Meyer–Olkin (KMO) value was 0.905 exceeding the recommended level of 0.60 and Bartlett’s test of sphericity reached statistical significance as well. Thus, the KMO confirmed sampling adequacy for PCA for organizational culture.

The measurement model is satisfactory; the next step is to evaluate the structural model, also called the inner model. To assess the structural model, the bootstrapping procedure (5,000 resamples) was used following Hair, Hult, Ringle, and Sarstedt (2016). The five-step procedure for structural model assessment was followed: assessing the path coefficient, assessing the level of R-square, assessing the effect size F², and finally assessing the predictive relevance Q².

3.5.1 Path coefficient. In sum, the principal hypotheses testing is summarized in Table 1. Organizational culture is found to have a significant impact (H2), whereas national culture has no significant impact on the endogenous variable (H1), as shown in Table 1.

3.5.2 Coefficient of determination R². The independent variables jointly explain 45% of the dependent variable as shown in Table 2. The overall R² is found to be moderate since R² ranges between 0.33 and 0.67 (Chin, 1989), and is acceptable since, according to Falk and Miller (1992), it is above 0.10.

3.5.3 Effect size F². The effect size measures the contribution of each exogenous construct on the construct (Hair et al., 2014). According to Cohen (1988), if F² is between 0.15 and 0.35, it is considered a medium effect size. While if it is less than 0,02, it is considered with no effect size as for national culture (see Table 3).

3.5.4 Predictive relevance Q². Q² for the endogenous variable indicated an acceptable predictive relevance. Using the blindfolding procedure in PLS, we measured the construct prediction capability, a Q² greater than 0 indicates that the model tested has a predictive relevance as shown in Table 4.

3.5.5 Control variables. This study has hypothesized that firms’ characteristics would have an impact on the GSCM level of application. The effect of the firm type on GSCM is positively significant (β = 0.261; p < 0.01), and the effect of the firm size is positively significant as well (β = 0.205; p < 0.01), as depicted in Figure 1. While the industry sector’s effect is not significant (β = 0.006; p > 0.01). Hence, H3 was partially accepted, see Table 5.

Relationship	β	Sample mean (M)	Std. dev (STDEV)	Confidence interval		T-statistics	p-values
				2.5%	97.5%		
H1. National Culture → GSCM	-0.018	-0.024	0.078	-0.222	0.100	0.234	0.815
H2. Organizational Culture → GSCM	0.402	0.405	0.092	0.174	0.547	4.390	0.000***

Table 1.
Path coefficient

Note: ***Path is significant at p < 0.01
Source: Table by author

4. Discussion and future research

This study seeks to advance our understanding of the relationship between national culture and GSCM in first subsection, organizational culture and GSCM in the second subsection and the role of firms' characteristics in the third subsection. We sought to discuss the findings as follows:

4.1 *The relationship between national culture and green supply chain management*

The first hypopaper postulated a direct and significant effect between national culture and the GSCM within Moroccan-based firms. However, the observed relationship was not significant. Past literature has reported mixed results on the relationship between national culture and environmental initiatives, with some reporting a positive and significant impact and others indicating no relationship between culture and sustainability practices. The two main national culture frameworks – Hofstede and Globe – were largely found related to sustainability literature. However, few papers only used the Globe cultural dimensions. The strength of this study lies in this fact; however, the scholars who have looked at the Globe cultural framework are [Calza et al. \(2016\)](#), [Miska et al. \(2018\)](#) and [Parboteeah, Addae, and Cullen \(2012\)](#). The established model reveals a statistically insignificant direct link between national culture and GSCM. There are similarities between the attitudes expressed in this study and those described by earlier studies. For instance, in comparison with the model developed by [Cox, Friedman, and Tribunella \(2011\)](#), national culture has no significant effect except for power distance that negatively 189 impacts the environmental sustainability adoption, which partly confirms our findings. The understanding is critical due to the individual perception of cultural values and practices, which vary across managers. The results seem to contradict the

Construct relation	R^2	Result
GSCM practices	0.450	Moderate

Source: Table by author

Table 2.
R-square of the latent variable

	GSCM	Result
National culture	0.016	Small effect size
Organizational culture	0.279	Medium effect size

Source: Table by author

Table 3.
Effect size F^2

	SSO	SSE	$Q^2 (=1 - SSE/sso)$
GSCM	390	175.271	0.551
National culture	260	168.713	0.351
Organizational culture	390	237.26	0.392

Source: Table by author

Table 4.
Construct cross-validated communality

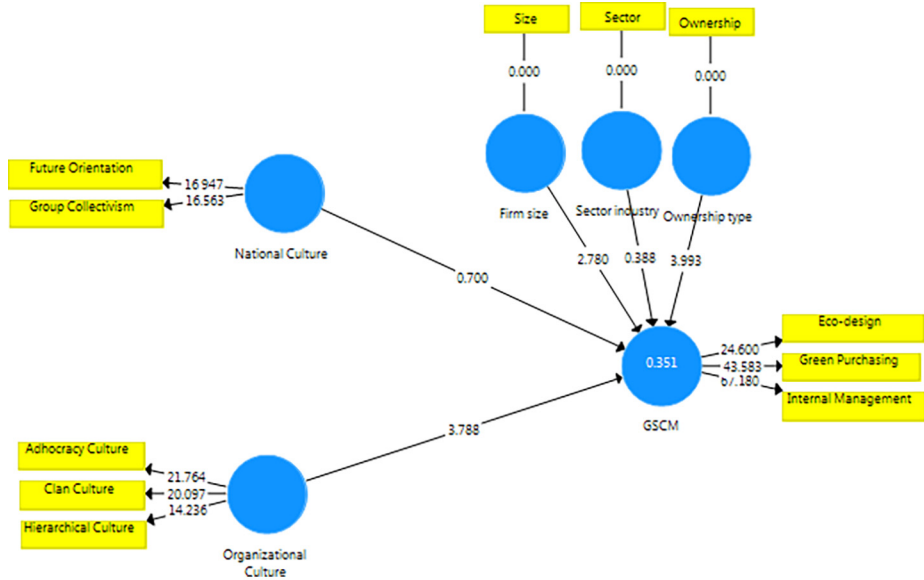


Figure 1.
Structural model:
control variables'
effects

Source: Figure by authors from Smart PLS

	Original sample (O)	Sample mean (M)	Std. dev (STDEV)	T statistics ((O/STDEV))	p-values
Sector industry → GSCM	0.006	0.009	0.073	0.082	0.935
Firm size → GSCM	0.205	0.204	0.074	2.767	0.006***
Ownership type → GSCM	0.261	0.265	0.073	3.559	0.000***

Table 5.
Control variables

Note: ***Path is significant at $p < 0.01$
Source: Table by author

findings of [Calza, Cannavale, and Tutore \(2016\)](#), who claim that the values of in-group collectivism, PO, assertiveness, and uncertainty avoidance negatively affect firms' environmental proactivity and future orientation, GE have a positive effect. These results match those observed in another study in which [Parboteeah et al. \(2012\)](#) researched the manufacturing industry within 33 countries and identifies a relationship between the propensity to support sustainability practices and national culture using the GLOBE project. The results do not support our observation; the authors found future orientation and collectivism to have a positive impact on firms' propensity to support sustainability. The findings of [Miska, Szócs, and Schiffinger \(2018\)](#) based on a sample of 1,924 companies in 36 countries using project GLOBE contradict our findings. Future orientation was found to be positively associated to sustainable practices along with GE, uncertainty avoidance and power distance. However, in our study, national culture was found to have no influence on any green initiative. Consistent with [Caprar and Neville \(2012\)](#), perceiving and valuing sustainable and environmental initiatives do not necessarily mean implementing them; it depends on the other level's capacity and

responsibility. The dual effect model of culture (norming-conforming) explains the variation between the existence of the sustainability norms and regulations and the response for its acceptance by firms. The findings of [Branzei, Vertinsky, Takahashi, and Zhang \(2001\)](#) indicate these dimensions to be varied and influenced by cross cultural differences, which may be justified by the similarities or compatibility existing between culture and sustainability initiatives. [Roy & Goll \(2014\)](#) elaborated and validated a similar model using Globe cultural practices in relationship with a country's social and institutional capacity for implementing sustainability. The paper of [Husted \(2005\)](#) argued that culture must be included in the discussion of environmental sustainability. Using Hofstede's framework, the author conceived a model based 190 on cross-cultural management literature. Based on the findings, in fact, [Vachon \(2010\)](#) assesses the linkage between national culture and corporate sustainability development practices in 55 countries, the results suggest that two of Hofstede's national culture dimensions are linked to a higher degree of sustainable initiatives. Another important application of Hofstede's national culture framework demonstrated the significance of culture in relationship with environmental sustainability ([Park et al., 2007](#)).

4.2 The relationship between organizational culture and green supply chain management

The second direct effect measured in this paper postulates that organizational culture has a direct and significant impact on the GSCM. Our results indicate that adhocracy culture, clan culture and hierarchical culture have a positive impact on the implementation of GSCM initiatives. In accordance with the present study, previous studies have demonstrated that organizational culture is an important driver of sustainability implementation. It is important to mention that the competing values framework can be studied as well using two dimensions: flexibility-oriented culture and control-oriented culture. For instance, [Chu et al. \(2018\)](#) analyzed the moderating role of organizational culture by means of flexibility-oriented organizational culture and control-oriented organizational culture at the third-party logistics industry. According to the authors, the flexibility-oriented cultures strengthen the effect of customer pressure, green innovation and financial performance, while control-oriented corporate cultures weaken these effects. It is encouraging to compare this result with the findings of [Dai, Chan, and Yee \(2018\)](#), who studied the moderating effect of organizational culture on the relationship between market pressure and corporate environmental strategy. This study confirms that clan culture is associated with GSCM practices, which corroborates the idea of [Miao, Cai, and Xu \(2012\)](#), who suggested that clan culture is an important antecedent of logistics social responsibility (LSR). These results are consistent with [Muduli et al. \(2013\)](#) as well who identified work culture and top management support as strong behavioral factors with a weak dependence power in GSCM implementation in Indian mining industries. [Muduli et al. \(2019\)](#) studied equally work culture's impact on GSCM performance in the Indian mining industry. Organizational work culture includes rules framed by a group and does encourage employees and positively affects their motivation toward environmental initiatives through relevant training and relevant reward scheme. [Chan, He, Chan, and Wang \(2012\)](#) has been able to empirically confirm the significant relationship between internal and external environmental orientation and GSCM, i.e. green purchase, customer cooperation and investment recovery based on responses from 194 Chinese firms in light and heavy industries. These results seem to be congruent with [Ambekar, Prakash, and Patyal \(2019\)](#) who have studied the role of organizational culture in low-carbon supply chain capabilities. [Abdul-Rashid, Sakundarini, Ariffin, and Ramayah \(2017\)](#) empirically proved company culture to be a

main driver that positively affects sustainable manufacturing practices in Malaysia. These results also seem to be partly congruent with [Sugita & Takahashi \(2015\)](#), who revealed that adhocracy culture has statistically significant positive relationships with environmental management. Yet, according to the authors, an excessive hierarchy culture has a negative relationship with the overall score of environmental management while we have found a positive support for the link between hierarchy culture and GSCM. A possible explanation for this may be related to the Moroccan perception of hierarchical culture as a culture with very formalized procedures with their leaders as good organizers that appreciate sustainability objectives and vision besides the smooth-running organization and predictability. For instance, [Abbett, Coldham, and Whisnant \(2010\)](#) suggested matching sustainable initiatives with organizational culture types using various tactics at different levels. In collaborative cultures, firms may facilitate group brainstorming sessions, develop internal collaboration platforms, improve employee's suggestions and feedback, and create cross-functional working groups to facilitate idea sharing and assessing the success of teams in implementing sustainability initiatives. In the hierarchical culture, control tactics were suggested explaining how initiatives begin by means of analyzing and auditing the existing processes and environmental impacts. Control tactics equally illustrate how initiatives start by setting expectations for employees to reduce system waste, emphasizing system optimization and smooth-running efficiency, and setting track adherence to environmental regulations as well as creating metrics focused on ongoing reduction of the firms' environmental footprint. The market culture supposes compete tactics including establishing goals and measures based on firms' vision, benchmarking performance and keeping assessing how the GSCM initiatives contribute to the competitiveness of firms. Market culture was not considered in the analysis due to collinearity issues. However, based on operations management literature and various analytics models, [Lin et al. \(2001\)](#) addressed corporate culture as a behavioral dimension explaining environmentally conscious business practices. [Setthasakko \(2009\)](#) investigated the barriers to implement corporate environmental responsibility in Thailand using a qualitative approach. The study revealed three critical barriers, including the absence of top management commitment and cultural diversity within the seafood processing companies. Similarly, [Kumar et al. \(2019\)](#) categorized organizational culture as human resource soft dimensions together with top management commitment, teamwork and employee involvement were highly prioritized as main drivers for an efficient GSCM implementation based on the best worst method and decision-making trial and evolution laboratory approach. While exploring the antecedents of LSR within the Chinese context, clan culture was supported to have a significant and positive impact on all the studied dimensions of LSR: supplier selection, product delivery to customers, environmental protection, humanity to employees and philanthropy/community ([Miao et al., 2012](#)). Surprisingly, the pressures from competitors, suppliers and customers had no impact on the LSR implementation. Relatedly, in his study, [Chu et al. \(2018\)](#) investigated how customer pressures impact green innovation implementation and the moderator role of organizational culture based on survey data collected from 165 third-party logistics providers (TPLs) in China. Thus, to maximize the robustness of the results, we included three control variables at the firm level of analysis to be tested separately, i.e. firm size, ownership type and industry sector. The test of control variables showed firm size and ownership type to have an effect on the dependent variable. Based on the arguments advanced in prior literature, the firm size does, as expected, exert a significant control

over the adoption of GSCM initiatives, e.g. [Testa and Iraldo \(2010\)](#) and [Zhu and Sarkis \(2004\)](#). The firm size was measured based on the number of employees. In fact, previous research revealed the impact of the firm size on sustainability practices. For instance, [Zhu, Sarkis, and Lai \(2008\)](#) studied the role of organizational size in the adoption of GSCM practices in China and revealed using a survey data collected from over 200 China-based firms. Their study revealed that medium- and large-sized firms are more advanced in some aspects of GSCM more than small ones. Earlier, [Zhu, Sarkis, and Lai \(2007\)](#) confirmed that eco-design implementation differs from a large firm than to a small firm.

[Eltayeb & Zailani \(2009\)](#) also reached the same conclusion that firm size is a relevant condition for sustainability implementation, and that is thanks to the greater availability of resources and competences ([Jabbour et al., 2014](#)). To a large extent, the firm size matters as an important contributor to the corporate environmental sustainability reporting CESR practices, according to [Gallego-Álvarez & Ortas \(2017\)](#). Similar to the firm size, we invoke that ownership type positively relates to such support for GSCM. Regarding the issue, the ownership type of the firm is measured using three categories, 196, namely, Moroccan-fully owned firms, wholly foreign firms and joint ventures. Based on the findings, the current study shows that the ownership type displayed predictive value in the model. This means that there are variations in implementing environmental sustainability initiatives based on the ownership type, foreign or local entities. These findings do support previous research. For instance, [Abdul-Rashid et al. \(2017\)](#) identified the impact of ownership type and type of industry as control variables and confirmed that there are variations between different sector industries and ownership types in implementing sustainable manufacturing practices. The firm ownership structure was used as a controlling variable in [Gallo and Christensen \(2011\)](#) to examine whether publicly-traded firms are more likely than privately-owned firms to incorporate sustainability and report sustainability policies. Based on the arguments provided, prior works relate to environmental management systems' incorporation which indicate that public-traded firms have greater chances and capabilities than private ones. We controlled the industry type by hypothesizing that the industrial sectors may differ in terms of the levels of adoption of GSCM. However, contrary to expectations, this study found a nonsignificant control of the industry type over the adoption of GSCM initiatives. We included 13 industry sectors in the study to examine the industry affiliation. The 13 sectors were coded into 13 dummy variables, taking the value of 1 if the firm belongs to the industry and 0 if it is outside the industry. In prior works, scholars focus on analyzing GSCM incorporating within one determined industry while others go for across industry studies. Our doctoral study examines both manufacturing and transportation sectors as the omitted industries in our study. For this reason, we control the GSCM for this factor to indicate the extent to which the industry type has a direct and positive influence on GSCM. Though the firm size and ownership type have a significant impact on incorporating GSCM practices, the industry sector seems to be insignificant in the model. [Zhu and Sarkis's \(2006\)](#) intersectoral comparison study of GSCM in China partially contradicted our results. The absence of the relationship between GSCM level of adoption and industry type could be explained in the case of this study by the fact that all the industries are concerned with environmental solutions and firms in each industry face all same interests regarding sustainability issues and regulatory legislations.

5. Conclusion

An important result of this paper was to explore the Moroccan context in terms of adopting GSCM practices and the influence of national and organizational culture. To assess the measurement and structural models, confirmatory factor analysis and 204 structural equation modeling were used. The measurement model consisted of three main multidimensional constructs, each measured with items adopted from previous literature. Three control variables are associated with the GSCM adoption, and therefore, in this paper, we used the firm size, the firm type and the industry sector. Consequently, and drawing on the quantitative approach, the present paper examines the direct effect between national culture and GSCM (*H1*) and the direct effect between organizational culture and GSCM (*H2*). In fact, organizational culture was found to be a significant predictor of GSCM operations in Moroccan organizations. This result corroborates prior studies of [Chu et al. \(2018\)](#). Furthermore, the findings indicate that national culture is not statistically a significant variable in explaining the implementation of GSCM practices. This finding is in line with previous studies of [Cox et al. \(2011\)](#), who empirically showed national culture to be insignificant. The reasons for the absence of a significance relationship between national culture and GSCM may be explained by various facts, including [Miska et al. \(2018\)](#). There were three main control variables, including industry type, firm size and ownership type. With regard to the industry type, previous studies, e.g. [Wong et al. \(2012\)](#) and [Zhu et al. \(2007\)](#), outlined that the automotive industry, for instance, is a leading industry in implementing GSCM initiatives. However, our results indicated that the second direct effect measured in this paper postulated that organizational culture has a direct and significant impact on GSCM. Our results indicate that adhocracy culture, clan culture and hierarchical culture have a positive impact on the implementation of GSCM initiatives. The study also found the adoption of GSCM initiatives to be influenced by the firm size and the firms' ownership type. In other words, large firms tend to implement green practices more than small firms do. These results corroborate the results reported by [Abdul-Rashid et al. \(2017\)](#) and [Gallo and Christensen \(2011\)](#), who found firm size and ownership type as important control variables. However, this research was not able to establish an empirical support for *H1*. Hence, further study of various aspects of this relationship is recommended.

This study obtained 130 valid responses from Moroccan firms operating in cross industries, extending this research question to other industrial sectors in Morocco and other countries may bring more insights about how the GSCM practices are implemented and linked to cultural differences. Increasing the number of participating firms and comparing different countries is of great relevance. Another limitation of the study is related to the research methods. Approaching this study using different research methods will help clarify the links between culture and GSCM. A third limitation resides in the fact that this study was conducted in the manufacturing sector mostly; the service sector may be included in future studies. Likewise, this study is based on a quantitative survey and did not include any case studies to complement the results and add the mixed methods' value to the study. Not all the cultural dimensions were included in our study because of high multicollinearity leading to the exclusion of one or more national culture dimensions. Another limitation may be framed in the fact that our contribution is related to one dimension of sustainability, which is the environmental aspect, even if some social issues have been modestly investigated. Another potential limitation of this paper is that data was obtained from managers.

The abovementioned limitations broadly provide opportunities for further research. In fact, the outcomes of the analysis of this study open up for several future research directions.

First, it is suggested that further research should evaluate the role of both national and organizational culture using different frameworks. Moreover, another research direction is to include additional contextual dimensions specific to the Moroccan context, including religion, language and so forth. Knowing that religion plays an important role in ethical business and decision-making; language is also another important element due to the higher degree of multilingualism in Morocco. Ultimately, considering various measures for culture may be relevant to the research study in the Moroccan context. Other firms' characteristics may be studied and linked to GSCM implementation, including firms' age, certifications, localization and geographical dispersion. The age of a firm may influence the GSCM adoption. An older firm may largely differ from a younger one in terms of building resources and capabilities for sustainability implementation. Additional moderating and mediating effects on the relationship between GSCM and cultural factors remain scarce. Further studies may look at these relationships from various perspectives. Second, in view of other possible research methodologies to assess the developed conceptual model, further research is, consequently, recommended using different research methodologies, e.g. mixed methods to bring more insights into the topic, case studies to further explore the cultural and internal antecedents to adopt GSCM initiatives. Third, given that the unit of analysis in this paper is the individual from the top management to assess the organizational level, a further study should be carried out on the individual level by considering the employees' perspectives as well and going behind the top management perspectives.

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Appendix 1. Construct items

Predictor variables	Dimensions	Reference
National culture (globe)	Power distance (PD) Uncertainty avoidance (UA) Performance orientation (PO) Gender egalitarianism (GE) In-group collectivism (ING-COLL) Institutional collectivism (INS-COLL) Assertiveness (ASS) Humane orientation (HO) Future orientation (FO)	House <i>et al.</i> (2004)

Table A1.
Independent variable
(national culture) **Source:** Table by author

Dimensions	Items
Clan culture (CLAN)	<ol style="list-style-type: none"> 1. The climate inside firm emphasizes good employee relations. It is participative and supportive 2. The glue that holds firm together consists of loyalty and commitment 3. Firm's mission and vision statements promote an image of firm as an employee-focused company 4. Firm's general manager is generally considered to be a mentor, facilitator and team player 5. At firm, middle management encourages teamwork, consensus and participation 6. At firm, recognition and rewards are most often given to those who are cooperative and team players 7. At firm, recruitment and selection practices are geared to bring in employees who are courteous, friendly, supportive and fair
Adhocracy culture (ADHOC)	<ol style="list-style-type: none"> 1. The climate inside firm emphasizes dynamism, growth and readiness to meet new challenges 2. The glue that holds firm together is a focus on innovation and development 3. Firm's mission and vision statements promote an image of firm as an innovative and entrepreneurial company 4. Firm's general manager is generally considered to be an entrepreneur, innovator and risk-taker 5. At firm, middle management encourages individual initiative, innovation, freedom and uniqueness 6. At firm, recognition and rewards are most often given to those who take initiative and adapt to change 7. At firm, recruitment and selection practices are geared to bring in employees who are creative, autonomous and adaptable
	<i>Dimensions items</i>
	<i>Hierarchical culture (HIER)</i>
	<ol style="list-style-type: none"> 1. The climate inside firm emphasizes stability and predictability. Expectations regarding procedures are clear and enforced 2. The glue that holds firm together is its formal procedures, rules and policies 3. Firm's mission and vision statements promote an image of firm as a stable and rule-oriented company 4. Firm's general manager is generally considered to be a coordinator and organizer 5. At firm, middle management enforces rules, procedures and consistency 6. At firm, recognition and rewards are most often given to those who abide by the rules and express caution 7. At firm, recruitment and selection practices are geared to bring in employees who are conservative, logical and predictable
	<i>Market culture (MARK)</i>
	<ol style="list-style-type: none"> 1. The climate inside firm emphasizes competitive actions and achievement 2. The glue that holds firm together is an emphasis on productivity and goal accomplishment 3. Firm's mission and vision statements promote an image of firm as a competitive and achievement-oriented company 4. Firm's general manager is generally considered to be a hard driver, producer and competitor 5. At firm, middle management emphasizes hard-driving competitiveness, productivity and achievement of results 6. At firm, recognition and rewards are most often given to those who are hard-driving, productive and competitive 7. At firm, recruitment and selection practices are geared to bring in employees who are competitive and achievement-oriented

Source: Table by author

Table A2. Independent variable (organizational culture)

Table A3.
Control variables
(firms'
characteristics)

Level of analysis	Control variables
Firms	1. Firm size 2. Industry sector 3. Firms ownership's type

Source: Table by author

Comp	Initial eigenvalues		Total variance explained		Extraction sums of squared loadings		Rotation sums of squared loadings	
	Total	(% of variance)	Total	(% of variance)	Total	(% of variance)	Total	(% of variance)
1	3.607	21.220	3.607	21.220	21.220	19.862	3.377	19.862
2	2.388	14.049	2.388	14.049	35.269	11.295	1.920	31.158
3	1.641	9.653	1.641	9.653	44.922	10.375	1.764	41.533
4	1.570	9.235	1.570	9.235	54.156	9.341	1.588	50.873
5	1.298	7.634	1.298	7.634	61.790	9.111	1.549	59.984
6	1.150	6.762	1.150	6.762	68.552	8.568	1.457	68.552

Source: Table by author

Table A4.
Total variance explanation of national culture

RAUSP
59,2

118

	Rotated component matrix ^a					
	Component					
	1	2	3	4	5	6
PD1		0.860				
PD3		0.861				
ASS3					0.839	
ASS4					0.803	
HO3				0.721		
HO4				0.808		
FO1	0.713					
FO2	0.715					
FO3	0.790					
GCOL3						0.776
GCOL4						0.834
UAV1			0.704			
UAV3			0.772			

Table A5.

Rotated factor matrix
of national culture

Notes: Extraction method = principal component analysis; rotation method = varimax with Kaiser normalization; ^aRotation converged in 16 iterations

Source: Table by author

Comp	Initial eigenvalues		Total variance explained				Rotation sums of squared loadings	
	Total	(%) of variance	Total	(%) of variance	Cumulative (%)	Total	(%) of variance	Cumulative (%)
1	10.490	52.448	10.490	52.448	52.448	4.357	21.787	21.787
2	2.209	11.047	2.209	11.047	63.495	3.919	19.593	41.380
3	1.531	7.656	1.531	7.656	71.151	3.715	18.577	59.957
4	1.318	6.589	1.318	6.589	77.740	3.557	17.783	77.740

Source: Table by author

Table A6. Total variance explained for organizational culture

RAUSP
59,2

120

		Rotated component matrix ^a			
		Component			
		1	2	3	4
HC1					0.834
HC2					0.618
HC3					0.776
HC4					0.816
MC1			0.780		
MC2			0.665		
MC3			0.850		
MC4			0.866		
MC5			0.811		
CC1	0.755				
CC2	0.830				
CC3	0.805				
CC4	0.880				
CC5	0.843				
AC1				0.751	
AC2				0.784	
AC3				0.822	
AC4				0.729	
AC5				0.699	

Table A7.

Rotated factor matrix
on organizational
culture

Notes: Extraction method = principal component analysis; rotation method = varimax with Kaiser normalization; ^aRotation converged in five iterations
Source: Table by author

Comp	Initial eigenvalues		Total variance explained		Extraction sums of squared loadings		Rotation sums of squared loadings	
	Total	(%) of variance	Total	(%) of variance	Total	(%) of variance	Total	(%) of variance
1	19.490	49.973	19.490	49.973	49.973	49.973	5.908	15.149
2	2.604	6.676	2.604	6.676	56.650	56.650	5.052	12.954
3	2.142	5.493	2.142	5.493	62.142	62.142	4.396	11.272
4	1.710	4.384	1.710	4.384	66.527	66.527	3.843	9.853
5	1.499	3.843	1.499	3.843	70.370	70.370	3.734	9.576
6	1.252	3.210	1.252	3.210	73.580	73.580	3.426	8.784
7	1.040	2.668	1.040	2.668	76.248	76.248	3.378	8.661

Source: Table by author

Table A8.
Total variance explained of GSCM

RAUSP
59,2

122

	Rotated component matrix ^a						
	1	2	3	4	5	6	7
IEM1			0.669				
IEM2			0.735				
IEM3			0.722				
IEM4			0.683				
GP1		0.619					
GP2		0.729					
GP3		0.742					
GP4		0.812					
GP5		0.762					
CCC1							0.816
CCC2							0.786
CCC3							0.732
IR1						0.751	
IR2						0.868	
IR3						0.839	
GPK1					0.658		
GPK2					0.676		
GPK3					0.617		
GL1	0.642						
GL2	0.767						
GL3	0.771						
GL4	0.573						
GL5	0.668						
GL6	0.724						
GL7	0.637						
GL8	0.755						
GL9	0.576						
RL1				0.628			
RL2				0.735			
RL3				0.767			
RL4				0.790			
RL5				0.743			

Table A9.
Rotated factor matrix
on GSCM

Notes: Extraction method = principal component analysis; rotation method = varimax with Kaiser normalization; ^aRotation converged in nine iterations
Source: Table by author

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