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Research Article

Green Supply Chain Management and Sustainable Performance: The Mediating Role of Green Corporate Social Responsibility in Pakistani Firms.

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ABSTRACT

Aim/purpose: The aim of the study was to find the mediating role of green corporate social responsibility (GCSR) on the relationship between green supply chain management (GSCM) practices and sustainable performance**.**

Design/Methodology/Approach: Non-probability sampling technique was used. Using cross-sectional data, PLS-SEM was used to analyze the results. Confirmatory factor analysis (CFA) is run to investigate the reliability and validity of measurement model while bootstrapping was used to test the hypotheses.

Findings: Shows that there is direct positive and significant effect of GSCM and GCSR upon sustainable performance and GCSR mediate between GSCM practices and environmental sustainable performance. Moreover, insignificant association among GSCM, CSR and social and economic performance.

Originality: By studying the mediating role of GCSR on the relationship between green GSCM practices and sustainable performance this study has extended the body of knowledge of NRBV and stakeholder theory in developing countries**.** Moreover, indirect effect of GCSR provides new insights and open doors for sustainability in the manufacturing firms.

KEYWORDS: GSCM, GCSR, Sustainable performance, PLS-SEM, NRBV

1 | INTRODUCTION

Last two decades, which is causing the severe adverse effects upon the ecological system of our planet. The major problems related to the environmental issues are increasing very rapidly therefore it is very important for organizations, firms, different communities and even governments to take precautionary measures and take this serious matter in their consideration (Azam, et al 2022; Malik, et al 2021).

According to the publication of the Brundtland report in 1987 about sustainability, the publication emphasizes upon the elements of sustainability which are social, economic and environmental performance. The literature suggests it is very essential for the businesses to maintain a balance in all the three elements of sustainability and it is very difficult to achieve the balance and achieve success (Abbas, et al 2022). In this way, sustainable performance is also called triple bottom line principle which "meeting demands of current without compromising needs of future

generations"(Brundtland report, 1987).A substantial approach to corporate environmental management has emerged as a result of increased attention being paid to adverse environmental situations such as changing climate and environmental degradation. Environment-protection requirements are becoming increasingly stringent, which has had a significant impact on the corporate management (Azam, et al., 2022). The natural resource-based view (NRBV) concludes that environmental regulations have major benefits for businesses (Hart, 1995). Reduced energy and material use, enhanced stakeholder participation, lower costs, and improved product quality can all be achieved through the implementation of sustainable business practices.

The pursuit of environmental sustainability has become a strategy for businesses seeking to gain a competitive edge while also demonstrating the environmental stewardship that modern society requires (Chuang, &Huang 2018). In response to widespread public and government criticism, environmentally corporations have been pushed to reassess their manufacturing processes and supply chains. To be environmentally friendly through supply chain management is becoming increasingly popular because of the adoption of corporate responsibility for its supply chain operations by businesses (Adriana, 2009). The need for the idea of Green Supply Chain Management (GSCM) was created to include the environmental approach related to supply chains, which includes all phases of product development and its life cycle (Srivastava, 2007). GSCM "can also be categorized into a series of practices focused on collaboration and evaluation to meet environmental and economic objectives" (Azam et al., 2022).As can be seen from its definition, GSCM has a large number of expected applications in several fields. However, most studies on GSCM in its initial periods concentrated on a specific functional element, like green procurement or reverse logistics (Sarkis, 1999). The number of research examining the various stages of the supply chain from an environmentalist perspective has increased over time as well (e.g. Zhu & Sarkis, 2004; Rao & Holt, 2005; Shang Lu & Li, 2010; Kung, Huang, & Cheng, 2012; Zhu, Feng, Choi, 2017; Luthra, Garg, & Haleem, 2016; Younis, Sunadarakani, Vel, 2016;Vanalle, Ganga, Godinho, Filho, Lucato, 2017; Schmidt, Forestl, Schaltenbrand, 2017). As indicated by Diabat and Govindan(2011), GSCM might be a helpful instrument for adjusting ecological, financial, and social advantages. An environmentally friendly supply chain is vital for obtaining sustainable development (Green Zelbst, Meacham, Bhadauria, 2012; Rao & Holt, 2005; Sarkis Zhu, Lai, 2011). There is relatively little study on the influence of GSCM practices upon the components of sustainability that has been done in the literature. Thus, this paper uses eight dimensions of GSCM and to examine the direct effect of these dimensions on the elements of sustainable performance to contribute to the literature in this issue.

Furthermore, firms that seek to improve their environmental performance must consider their strategies and their talent. Most businesses must assess and adapt their core principles, aims, goals, structures and stakeholder relationships to address ecological social and economic concerns and overcome them. Increasing emphasis has been paid to corporate social responsibility (CSR) and how these factors influence business performance in recent decades. Both from academics and from businesses, green CSR can be defined as obligation of firms to reduce waste and maximize efficiency of their inputs and minimize negative influence of the firms' operation on the environment without compromising future of future generations. More studies are focusing on the factors that motivate organizations to participate in CSR adding the environmental concern to this concept (Mughal, Jehangir, Khan, & Saeed, 2020; Malik et al., 2021). So, green SCR is developing in a critical way to cover CSR in a broad sense,

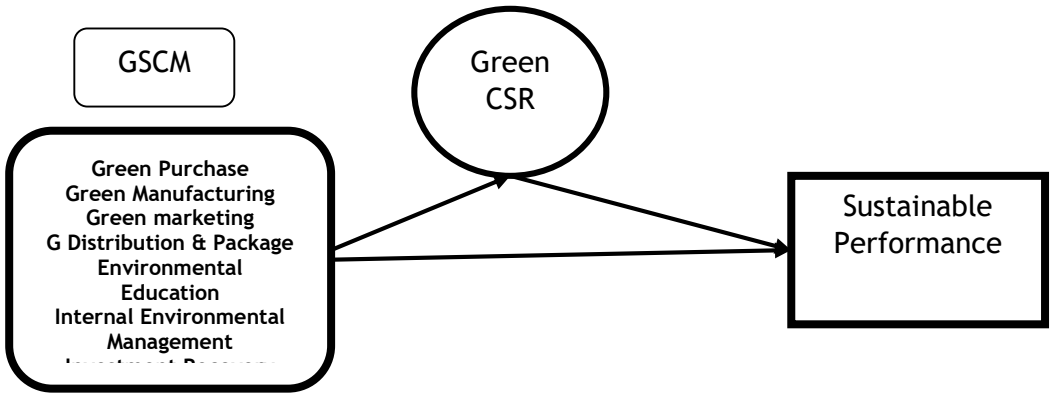
explaining in a better way interaction and competitiveness for businesses. Moreover, in this research green SCR play a mediator role between GSCM and sustainable performance because green CSR enhance the image of firms in eye of stakeholder, increase profits and help firms to reduce cost in their operations (Malik et al., 2021).

Our central claim is therefore that GSCM encourage the sustainable (environmental, social and economic) performance in Pakistani firms. Despite the fact that these studies were primarily concerned with economic performance, little by little environmental topic has been included. However, little attention to the social component of sustainability has been paid (Azam et al., 2022). Since most examinations on the connection among GSCM and sustainability are completed principally in industrialized nations, there is a gap in research in emerging nations (Geng, Mansouri & Aktas, 2017). In light of those issues, eight GSCM components will be created and decided to investigate the outcomes of these GSCM components on sustainability. Furthermore, this gap is even bigger around the green CSR in developing economies; so we want to see to what extent it can play an important role in moving all countries towards sustainability and the well-being of their citizens.

After explaining the importance and originality of the subject and describing the theoretical framework, we present the theoretical foundations and hypotheses. These are followed by description of the methodology used: sample and procedure, measurement instruments and path analysis. We then present the results and, finally, the corresponding conclusions, practical implications and limitations of this study.

2 | LITERATURE REVIEW

Figure 1.Hypothesised Model



1.1.Theoretical Foundations and Hypotheses

1.2.Framework of GSCM & sustainable performance: an NRBY & stakeholder theory perspective

Resource based view theory (RBV) (Barney, 1991) is used to explain the impact of GSCM on sustainable organizational performance. Internal resources of the firms are most valuable, rare and cannot be imitate by competitors thus help organization to obtain competitive advantage and sustainable performance (Cankaya & Sezen, 2019).

Hart (1995) observed that there is high increase in depletion of natural resources, pollution and environmental issues which are considered as threat to firms' capabilities. Thus, keeping in view these issues, Hart (1995) expanded the scope of RBV to NRBV natural resource-based view, claiming that firms can get competitive advantage by implementing green strategies such as GSCM. These practices can be a strategic resource that can improve firm performance due to they are difficult to imitate as they are based on experience, time and knowledge. For example, green reputation and good will can be achieved by the firm with passage of time.

The current scenario, with increment in competition and huge industrial revolution, which has damaged the natural environment, contributing to focus on quality of life which was led by social responsibility (Malik et al., 2021). With emergence of social responsibility's importance, the concept of stakeholder theory was emerged. Stakeholder theory was given by Freeman (1994) defined it as group or person who influence business achievements of its goals or get influenced internal and external by those goals. This theory argued that stronger the relationship will be with these stakeholders it will be easier for firms to achieve the competitive advantage and sustainable performance (Azam et al., 2022) and accepted practices such GSCM.

The changes experiences by societies due to earth threatening activities of manufacturing industries have forced researchers' scholars and practitioners' to modify industry process. These processes are the main reason of air pollution, liquid and solid trash, global warming, water pollution, renewable energy resources. Due to raising concerns from consumers and other stakeholders' sustainability expectations are the some of the motivation of this study to use both theories by bridging them to have deeper and better understanding of the problems faced by firms as well as communities; and how these problems of pollution, sustainability can be solved by conducting social responsibility activities to win the confidence of stakeholders. In addition, how firms can take benefits by initiating green activities in their supply chain. The current study would get new insights of natural issues and issues faced by firms to achieve sustainability.

1.3.GSCM and Sustainable Performance

GSCM is defined as effectiveness, efficiency and responsiveness of the system to buy raw material, manufacturing methods and deliver goods and services to end-user (Shekarian, Ijadi, Zare&Majava, 2022).It is measured by green purchase, green manufacturing, green marketing, and green distribution and packaging, internal environmental management; environmental education and investment recovery (Azam et al., 2022; Cankaya&Sezen, 2019). Apart from this, all researchers agreed to measure sustainable performance through environmental, economic and social performance (Cankaya & Sezen, 2019; Azam et al., 2022; Malik et al., 2021). Sustainability is defined as "use of natural resources without compromising the needs of future generations" (Liz, Suudolska, Tamanek, 2020).

Later, sustainability was given another name: triple bottom line principle (TBP) with 3 dimensions (Paul, Shukla, Paul & Trianni, 2021). Finally, these concepts could encourage each other, thus is GSCM could boost the three dimensions of sustainable performance.

Environmental performance relates with the effects on environment caused by firm manufacturing process. For the firms, it is essential first identify the potential sources of environmental issues such as production, manufacturing, transport. Firms produce products and services to meet the needs of society which cause pollution, release of CO_2, waste of energy, air, water etc. (Shekarian et al., 2022). Number of researchers and studies argued that environmental performance of the firm is assessed by ability of firm to reduce waste of energy, water, carbon gas and efficiently and effectively reduce use of natural resources (Yusliza et al., 2020; Yong et al., 2020). On the other hand, economic performance of firm is aimed at reducing cost. Cost in terms of purchase of raw material, transport, production of goods and waste of money on environmental accidents in form of fines (Anwar et al., 2020).To initiate the green strategies, it incurs a huge cost to firms. Some authors argued that green purchase could increase the cost for the firm while second point of view argues that GSCM could affect the firms' economic performance in appositive manner. Firms by implementing green activities could enhance the increase their reputation which would increase their economic performance on the other side firms can reduce waste of energy, water and other resources and can save lot of cost (Azam et al., 2022: Cankaya & Sezen, 2019).

Furthermore, social performance is related with well-being of employees, society and other stakeholders. A firm operates in the societies where human beings are living (Koberg & Longoni, 2019). Due to manufacturing procedures of the firms and negligence of human behaviour have raised many issues which are harmful for not only environment but for the health of human as well. It is the responsibility of the firms to take care of issues of environment as well as health and well-being of their employees, suppliers, creditors, and people living around (Nilsson & Goransson, 2021). For this purpose, firms have to incorporate green policies in their supply chain so that the material they buy for manufacturing or production process should meet the environmental standards set by firms and which help firms to produce eco-friendly products which are less harmful for environment and societies. Proper safety training and equipment must be provided to workers during working hours (Pimenta, Balls, Salonitis, 2021). This is the social responsibility of the firms to help society in which they are operating because the firms are using the resources of that society. This gives rise to social sustainability and corporate sustainability. There is significant positive relationship found between GSCM and sustainable performance (Famiyeh et al., 2018). On the basis of above discussions following hypotheses are developed:

H_1: GSCM is positively and significantly related with sustainable performance.

1.4.The Mediating Effect of GCSR on the relationship between GSCM and Sustainable Performance

It is the legal and ethical responsibility of the firms to take care of the communities, societies and stakeholders. The interest of all stakeholders should be taken into consideration. Initiating green activities and conducting GCSR shows ethical behaviour of firms, employees feel proud to be part of the firms and production of good quality cost effective products and giving complete details of the products to customers and consumers, listen to issue and problems of not only customers but all stakeholders and keeping long term good relationships with suppliers

and creditors would help firms to achieve competitive advantage and better sustainable performance (Farrukh, Sajid, Lee, Shahzad, 2019; Agudelo, Johannsdottir, Davidsdottir, 2019; Oukouei, 2018). However, no studies so far have tried to examine the relationship between GCSR and green supply chain management, only some of the researchers have identified that implementing CSR policies would be beneficial to gain trust between businesses and social relationships(Lu, 2018).Innovation in the business which can be beneficial for the society in general is the way of achieving involvement of the society, develop innovative ideology in the company can play an essential role to achieve economical victory and sustainable enhancement. Supply chain is considered to be the relation and alliance of the humans in real which will develop a strong bonding and cooperation in business activities of same nature(Cousins, Lawson & Peterson, 2019).So, GSCM practices have also positive effect on GCSR.

GCSR has positive effect in firms' performance (Mughal et al., 2020) and sustainable performance (Malik et al., 2020). Although some studies reported negative influence of GCSR on sustainable performance, the reason why it is negative because investors think GCSR activities reduces their percentage of profits so they are reluctant to invest in those firms who conduct GCSR at regular intervals (Malik et al., 2021). GCSR is held responsible to increase the image of the firms, reputation and help firms to attract investors and talented staff. In addition, GCSR help firms to attain competitive advantage and sustainable performance. The research in recent years have highlighted the importance of sustainable innovation and green technologies and social responsibility (Kavacova & Lazaroiu, 2021).

The idea of GCSR is attractive in terms of exchanging the information and transformation of managerial decisions and, in this way, it enhances the production process while forming the innovative business model with societal development (Afsar, et al, 2020). The researchers have identified in the recent years that customers have a demand of sustainable products and services, and there is also a pressure on the companies from the government, clients, employees and their rivals according to their interest regarding sustainability (Mazirir, 2020). The companies that are more concerned about their customers' demands and expectations definitely gain a competitive advantage among their competitors, thus GCSR is linked with the green practices of the company to involve in those creative ideas that are beneficial for the society, because corporate social responsibility improves the image of the organisations therefore it helps organisations to improve and achieve sustainable performance as well as competitive advantage therefore it creates a link between green supply chain management practices and sustainable performance(Suler, Palmer, & Bilan, 2021).

Some studies have reported the positive and significant relationship between GCSR, GSCM and sustainable performance (Koberg & Longoni, 2019; Chung et al., 2019; Cheema et al., 2019; Malik et al., 2021), and study proposes these new hypothesis based on above discussions:

H_2: GSCM is positively associated with GCSR.

H_3: GCSR is positively associated with sustainable performance.

H_4: GCSR significantly mediate between GSCM and sustainable performance.

3 | RESEARCH METHODS

3.1. Measures

The construction of the instrument is based on the dimensions discussed in this proposal with the help of literature review. The instrument designed for the research purpose has been approved by the expert academicians and from different industry experts for obtaining better results through its design, readable material, complexity and completeness in all respects (Dillman, 2000). The assessment of the components is based on a seven point Likert-type scale 1= strongly disagree to 7=strongly agree. The instrument of green supply chain management practices is adopted from Azam et al., (2022), sustainable performance scale is adopted form (Malik et al., 2020) green corporate social responsibility is adopted form (Malik et al., 2021). Green supply chain management practices has 26 items, 3 items for green purchasing and 3 for green manufacturing, 4 items for green distribution and packaging, 4 items for internal environment management, 6 for green marketing, 4 items for environmental educational and 2 for investment recovery. In addition sustainable performance has 15 items, five items for each construct (economic, social and environmental performance). Green corporate social responsibility has been adopted from (Malik et al., 2020).

3.1.2 Population and Sample

Organizations listed at Pakistan stock exchange (PSX); Security Exchange Commission of Pakistan (SECP); Small and Medium Enterprises development Authority (SMEDA) and State Bank of Pakistan (SBP) were selected. According to Malik et al (2020) there are 3.2 million small and medium firms are registered in which 19.72% are manufacturing firms. The interest to consider these companies in study is that "As manufacturing industries are considered as major contributor towards economy of a country on the other side manufacturing companies are also more responsible for increasing pollution, waste of energy and natural resources that is why these companies are included (Malik et al., 2020; 2021). In Pakistan manufacturing firms with 1—250 workers and annual sales of two fifty million Pakistani rupees were selected (Malik et al., 2021). Director HR, Manager HR and concerned officials were contacted and were asked by the researcher about green initiatives upon their information as well as come information provided at companies' websites also help researcher to confirm about this matter. As population is so big it is not possible to collect the data from all manufacturing firms' therefore non probability convenience sampling technique was used. Malik et al (2020; 2021) distributed 800 questionnaires and received 510 responses which is very high response rate. As researcher/author agree to use convenience sampling therefore studies which used same type of sampling are Yusliza et al (2019;2020); Anwar et al., (2020), Malik et al., (2020;2021); Azam et al., (2022); Garavan et al., (2022). In this study researcher has used convenience technique. The population of this research is based on 280 manufacturing companies i.e. cement, textile, sugar, wood, food, beverages, pharmaceutical, agriculture (FFC) furniture, leather and response of complete 215 questionnaires is received with a response rate of 76.78 %. Directors of human resources, managers and assistant managers participated in this study.

Table.1 **Demographic Information**

Variables	Characteristics	n	%
Size of organization	Large	4	1.9
	Medium	86	40.0
	Micro	3	1.4
	Small	122	56.7
Sector	Public	4	1.86
	Private	211	98.13
Areaofoperation	Local	81	37.7
	National	26	12.1
	Regional	108	50.2

3.2. Data Collection and Analysis Techniques

The manufacturing industries were mainly targeted to collect data. Survey has been done to receive the maximum accurate data from different manufacturing industries. Survey data is collected using two methods: online survey and face-to-face surveys (Zhu et al., 2013). The questioners have been distributed among different manufacturing industries to obtain the optimal accurate results in form of the response provided on those questioners, the distribution of questioners has been done after targeting the relevant manufacturing industries and receiving of the feedback is ensured to record the data. The questioner data is collected from different manufacturing industries of Pakistan at local, regional, and national level for this research purpose.The model designed for this research study is analyzed with the help of 2nd generation statistical software smart PLS which was introduced and developed by Ringle, Wende, Becker, Smartpls 3; SmartPLS GmbH: Boenningstedt, Germany, 2015; Hair, Hollingsworth, Randolph, Chong, Data Syst. 2017. The model formation of this study has second-order construct for sustainability. Therefore this study has first examined the first-order factor which is followed by second-order factors. Scale validations of complex and complicated constructs have been analyzed by using first and second –order factor.

Pre-Test/Pilot Testing

Before proceeding to the further analysis pilot test was conducted. According to Connelly (2008), extant literature suggests that a pilot study sample should be 10% of the sample projected for the larger parent study. However, Isaac and Michael (1995) suggested 10 – 30 participants; Hill (1998) suggested 10 to 30 participants for pilots in survey research; Julious (2005), and van Belle (2002) suggested 12; Treece and Treece (1982) suggested 10% of the project sample size however, Nunnally, 1978, did recommend having 10 times as many participants as variables). Kass and Tinsley (1979) recommended having between 5 and 10 participants per variable to investigate the reliability and validity of the scales. The reliability of the scale was checked through cronbachalpha and it was found that values of all constructs met threshold i.e. >0.70 (field, 2013).

Common method Bias

Herman Single factor analysis was run to check the common method bias in the data. It was revealed that total variance explained by all items of GSCM, GCSR and sustainable performance is 27.641% less than 50%

therefore; it is assumed that common method bias is not an issue in the data. Researcher can proceed for further analysis (Podsakoff et al., 2003).

3.3. Measurement and Structural Model

According to Ramayah, et al (2018), initially factor loadings, composite reliability, average variance extracted (AVE) and Cronbach alpha are investigated which is then followed by discriminant validity. After the analysis of data the results from different sources the reliability and validity test has been done. To check the reliability and validity of the data it has been done through its two types such as convergent validity and discriminant validity. The convergent validity interrogate and highlight the components of the instrument with the same opinion and this has been done with the help of convergent validity tools like extraction of average variance, complete reliability and factor loading. Discriminant validity interrogate and highlight the components of the instrument with difference related to their constructs and the tools used to check the discriminant validity are Fornell & Larker Criterion and Heterotrait-Monotrait ratio. Henseler et al., (2015, 2016), Hair et al., (2011).

Table 2: Measurement Model Convergent Validity and Reliability

Variables	Items	Loadings	AVE	CR	α
Green Manufacturing	GM1	0.92			
	GM3	0.934	0.857	0.947	0.917
	GM5	0.923			
Green Marketing	GM1	0.839			
	GM2	0.89			
	GM3	0.844	0.694	0.931	0.911
	GM4	0.706			
	GM5	0.878			
	GM6	0.828			
Green Purchasing	GP3	0.853	0.703	0.876	0.789
	GP4	0.777			
	GP5	0.883			
Internal EnvironmentalManagement	IEM3	0.891			
	IEM4	0.934	0.826	0.934	0.895
	IEM5	0.901			
Investment Recovery	IR1	0.887			
	IR2	0.923	0.891	0.900	0.781
Green Distribute & Packaging	GDP1	0.873			
	GDP2	0.81			
	GDP3	0.901	0.717	0.938	0.921
	GDP4	0.81			
	GDP5	0.858			
	GDP6	0.824			
Environmental Education	EE1	0.845			
	EE2	0.873			
	EE3	0.854	0.715	0.909	0.867
	EE4	0.808			
Green CSR	GCSR1	0.754			
	GCSR2	0.869			
	GCSR3	0.853	0.668	0.889	0.833
	GCSR4	0.788			
Sustainable Performance	ECP1	0.762			
	ECP2	0.851			
	ECP3	0.881	0.726	0.930	0.906
	ECP4	0.889			
	ECP5	0.87			
	ENP2	0.94			
	ENP3	0.928	0.866	0.951	0.923
	ENP5	0.924			
	SCP1	0.857			
	SCP2	0.904	0.772	0.944	0.926
	SCP3	0.89			
	SCP4	0.878			
	SCP5	0.863			

3.4. Measurement model

This study is based on the data collected from 215 manufacturing firms, the data was collected from

all major manufacturing firms, and the responses were collected on the basis of criteria set for the respondents which were chosen on set measures who have idea about GSCM, sustainability and green corporate social responsibility. PLS-SEM statistical tool is used for the data analysis, measurement model was developed after the execution of confirmatory factor analysis (CFA), the results obtained from the findings are shown in (**Table 1**) starting from green manufacturing two items were removed due to low factor loadings (GM2 and GM4), two items of green purchasing (GP1 and GP2), two items of internal environmental management (IEM1 and IEM2) and two items of environmental performance (ENP1 and ENP4) were excluded from the analysis due to factor loading lower than 0.7, all other items of the variables were included with the factor loading greater than 0.7 as suggested by Hair et al. (2014), furthermore results obtained shows that AVEs and CRs of all constructs meet the threshold values, such as, >0.50 and > 0.70, (see **Table 2**) Sarstedt et al. 2019.

Results obtained from Discriminant validity **Table 3**—HTMT criterion also shows that all the constructs are different from each other. Based on the above results it was concluded that convergent and discriminant validities are confirmed authentic and scales used in this study are found valid and reliable.

Table 3. Discriminant Validity (HTMT Ratios)

	EcoPerform	EnvirEducati	EnvirPerfor	GCSR	GreenDistrib	GreenManuf	GreenMk	GreenPurch	InternalEnvM	InvestReturn	SocPerform
EcoPerform											
EnvirEducati	0,104										
EnvirPerfor	0,266	0,141									
GCSR	0,312	0,139	0,644								
GreenDistrib	0,197	0,081	0,713	0,449							
GreenManuf	0,234	0,095	0,789	0,558	0,753						
GreenMk	0,265	0,22	0,574	0,243	0,715	0,631					
GreenPurch	0,071	0,551	0,246	0,192	0,485	0,259	0,46				
InternalEnvM	0,248	0,357	0,25	0,134	0,465	0,337	0,563	0,462			
InvestReturn	0,112	0,612	0,033	0,083	0,288	0,059	0,201	0,627	0,187		
SocPerform	0,108	0,131	0,262	0,208	0,276	0,245	0,312	0,528	0,273	0,259	

4 | DATA ANALYSIS AND RESULTS

To test the hypothesis bootstrapping with resample rate of 5,000 was run in PLS-SEM. Structural model is shown in **Table 3**. For obtaining beta, standard error, t-statistics, significance values, BCIUL and BCILL bootstrapping was suggested by Hair et al. (2014). It is evident from the results that GSCM has positive effect on environmental performance $\beta=0.643$, $t=10.286$, $p<0.05$, moreover, GSCM has positive effect on GCSR $\beta=0.506$, $t= 8.966$, $p<0.05$ and furthermore, GCSR has positive effect on environmental performance $\beta=0.250$, $t=3.646$, $p<0.05$, hence hypotheses 1, 2 & 3 are substantiated. Furthermore indirect effect of green corporate social responsibility was also investigated between GSCM and environmental performance and it was found that GCSR mediates between GSCM and environmental performance $\beta=0.127$, $t=3.281$, $p<0.05$ level, it means GCSR has complimentary mediating effects between GSCM and EP.

Table4. Direct Effects

Hypotheses	β	S.E	t	p
GSCMP→ENVP	0.643	0.063	10.286	0.000
GSCMP→GCSR	0.506	0.058	8.966	0.000
GCSR→SP	0.250	0.069	3.646	0.000

Table 5. Indirect Effects (Mediation Effects)

Hypotheses	β	S.E	t	p
GSCMP→GCSR→ENVP	0.127	0.039	3.281	0.001

Discussion

This study investigates whether GSCM practices help Pakistani manufacturing firms to obtain sustainable (economic, social and environmental) performance or not. Furthermore, it looks into if CSR encourage the previous relationship, due to it is to meet the needs of the society by keeping in a sustainable view. This study aims to ascertain the moderating effect of corporate social responsibility (CSR) on the relationship between green supply chain management practices and sustainable performance.

According to Agudelo *et al.* (2019) in late 1990s corporate sector was given a huge responsibility by the society because manufacturing firms only concern with economic benefits at that time. In late 2000s private sector Corporation as called upon by international community to significantly play their role for society. For example, United States established departments to meet the environmental and social needs of business (Mughal *et al.* 2020). In developing economies stakeholders' involvement, ethics are the key factors of CSR. One can easily understand shared values concept and expectations of the community and society form the corporation. This study helps readers to understand why CSR is beneficial for firms in emerging countries.

Findings of the current study revealed that GSCM practices have insignificant relation with economic and social performance. The reason for such insignificant association is that it is difficult for Pakistani firms to initiate and implement green initiatives because of cost and limited financial resources. Likewise Pakistani firms have to take care of the social well being of all stakeholder especially employees, societies and suppliers. There is lack of awareness about benefits of

economic sustainability and social sustainable performance found among Pakistani manufacturing firms. Management of the firms has to raise awareness about GSCM practices and CSR benefits. It could be beneficial for firms in the long run.

It was found that GSCM practices are positively related with environmental performance. Moreover, relationship between GSCM practices, CSR and environmental sustainable performance are also found significant, which are in line with findings of the past studies (Edsand & broich, 2020; Galbraith & Podhorska, 2021; Cankaya & Sezen, 2019; Ionescu, 2021). Firms taking into consideration the needs of the society as well as customers and stakeholders attracted the investors. By producing eco-friendly products and getting supply from those suppliers who are aware about environmental issues can have better image as well as by conducting socially responsible activities help the societies in leveraging the living standard. This implies that corporation in Pakistan shows ethical behavior by conducting socially responsible activities at regular time. The findings of the current study got support from the past studies (Malik *et al.* 2021; Azam *et al.* 2022; Mughal *et al.* 2020). Those firms who conducted CSR activities can attract talented and hardworking employees. Employees feel proud to be part of the ethical and socially responsible firms. The positive relationship between variables also explained the cost-effective production of goods and services, detailed information of goods and services provided to consumers and customers, listening carefully to complaints of customers, producing eco-friendly products, using less packaging and using cost effective methods of distribution of goods, creating long term relationship with customers, suppliers, and stakeholders is the reason of better environmental performance. Socially responsible firms can attract investors (Mughal, et al. 2020). These firms can improve the image and reputations of the firm in eyes of stakeholders. Firms can have better financial performance and obtain competitive advantage over competitors and enjoy benefits of CSR (Ionescu, 2021). Moreover, firms have to select that supplier who fulfils the green objectives and criteria of the manufacturing firms (Khan & Qianli, 2017; Khan, Zhang, Anees, Golpira, Lahmar, & Qianli, 2018). Suppliers must be aware about the environmental concerns and supply such material which is eco-friendly and less harmful for the environment.

5 | Conclusion

It is concluded that manufacturing firms have to select those suppliers who met the green initiatives criteria set by the firms. Initiating green activities help firms to save transportation, production, marketing, purchasing raw material cost; reduce environmental issues, save natural

resources, production of environmentally friendly products. On the other hand, initiating green activities need huge capital which would be burden for firms, but in future it would have advantages for all stakeholders. By doing so firms should be able to attract, investors, loyal customers, potential suppliers and talented employees. Attracting investors help firms to expand their business and capture market and attain competitive advantage. As consumers are willing to pay more for eco-friendly goods and services, thus firms must initiate green activities to meet the needs of customers and societies by conducting social responsible activities.

Theoretical Implications

Emerging economies find it difficult to implement green initiatives because it involve huge cost but in future manufacturing industries can save transportation cost, production cost, packaging and distribution cost which is the sustainable economic performance. Moreover, through green initiatives emerging economies can save the natural environment and resources, by doing this obtaining sustainable environmental performance would have a positive impact on economy, environment and business. The current study has contributed to the body of the knowledge of GSCM practices, environmental performances and CSR. The findings of the current study, positive relationship between constructs and significant mediating effects of CSR on the relationship between GSCM practices and environmental performance through lens of natural resource based view (NRBV) shows that NRBV are helpful for obtaining competitive advantage and environmental sustainable performance.

Managerial Implications

This study has offered implications for manufacturing firms, policy makers and practitioners and environmentalists. Policy makers cannot ignore environment while formulating policy for manufacturing sector. This study has offered win-win situation for societies, firms and the environment. Management of the firms must conduct cost-benefit analysis. At initial stages cost on training, operating cost, investment and procurement would be required but in the future firms can enjoy economic benefits such as green purchasing, manufacturing, packaging, distribution, offers some economic advantages to the manufacturing firms. Implementing GSCM practices could have synergistic effects on economic performance. This could lead towards super economic, financial, environmental, market related and social performance. Managers can promote ecocentricity (eco system partners) and forming supply chain traceability. According to Skilton and Robinson (2009) ecocentricity means firms learning from external stakeholder to

achieve sustainability while tracking and tracing the origin, history, characteristics, of specific product, and the ability to verify and identify the components of products. In addition knowing about the raw material, ingredients used in the product and getting all supply chain information is called traceability. Environmental performance could be enhanced through GSCM ecocentricity. It may not have direct effects but indirectly it help firms to enhance environmental performance. GSCM traceability could be improved through monitoring system, better monitoring system help in reducing risk and improve pollution prevention strategies.

Limitations and Future Research Directions

Offering several theoretical and managerial contributions the current study has some limitations which are essential to report here. First limitation is manufacturing sector, one must be careful while generalizing the findings to other sectors. Second limitation is nature of data is cross-sectional. It is recommended to use mix methods in future and qualitative studies along with quantitative would help the readers to understand the subject matter in depth. Moreover longitudinal data can also be collected. Third limitation, single mediator is used. It is recommended for future studies to use multiple mediators such as organizational citizenship behavior towards environment (OCBE), green intellectual capital, green human resource management practices, green inclusive leadership, green culture in future studies. Testing and extending the model used in this study beyond Pakistani firms into other contexts and perspective such as role of public sector hospitals in procurement requirement could be beneficial. Moreover, future studies could use secondary data.

REFERENCES

Abbas, A., Chengang Y, Zhuo, S., Bilal, Manzoor, S., Ullah I., Hayat, M, Y., (2022). Role of responsible leadership for organizational citizenship behavior for the environment in light of psychological ownership and employee environmental commitment: A moderated mediation model. *Frontiers in Psychology*,2 https://.doi.10.3389/fpsyg.2021.756570

Adriana, B. (2009), "Environmental supply chain management in tourism: the case of large tour operators", *Journal of Cleaner Production*, Vol. 17 No. 16, pp. 1385-1392.

Afsar, B., Maqsoom, A., Shahjehan, A., Afridi, S. A., Nawaz, A., and Fazliani, H. (2020). Responsible leadership and employee's proenvironmental behavior: the role of organizational commitment, green shared vision, and internal environmental locus of control. *Corporate Social Responsibility and Environmental Management*. 27, 297–312. doi: 10.1002/csr.1806

Agudelo, M. A. L., Jóhannsdóttir, L., Davídsdóttir, B. (2019). "A literature review of the history and evolution of corporate social responsibility," *International Journal of Corporate Social Responsibility*, Springer, vol. 4(1), pages 1-23, December.

Anwar, N., Mahmood, N. H. N., Yusliza, M. Y., Ramayah, T., Faezah, J. N., and Khalid, W. (2020). Green Human Resource Management for organisational citizenship behaviour towards the environment and environmental performance on a university campus *Journal of Cleaner Production*, 256, 120401.doi: 10.1016/j.jclepro.2020.120401

Azam T, Malik SY, Ren D, Yuan W, Mughal YH, Ullah I, Fiaz M and Riaz S (2022) The Moderating Role of Organizational Citizenship Behavior Toward Environment on Relationship Between Green Supply Chain Management Practices and Sustainable Performance. *Frontier Psychology*. 13:876516. doi: 10.3389/fpsyg.2022.876516

Barney, J.B. (1991), "Firm resources and sustained competitive advantage", *Journal of Management*, Vol. 17 No. 1, pp. 99-56.

Çankaya, S. Y., and Sezen, B. (2019). Effects of green supply chain management practices on sustainability performance. *Journal of Manufacturing Technology. Management*. 30, 98–121. doi: 10.1108/JMTM-03-2018-0099

Cheema, S., Afsar, B., & Javed, F. (2019). Employees' corporate social responsibility perceptions and organizational citizenship behaviors for the environment: The mediating roles of organizational identification and environmental orientation fit. *Corporate Social Responsibility and Environmental Management*, 27, 1–13. https://doi.org/10.1002/csr.1769

Chuang, Shun-Pin & Huang, Sun-Jen. (2018). The Effect of Environmental Corporate Social Responsibility on Environmental Performance and Business Competitiveness: The Mediation of Green Information Technology Capital. *Journal of Business Ethics*. 150. 10.1007/s10551-016-3167-x.

Chung, C., Jung, S., & Young, J. (2018). Do CSR activities increase firm value? Evidence from the Korean market. Sustainability, 10, 31–64.

Connelly, L.M. (2008) Pilot Studies. MEDSURG Nursing, 17, 411-412.

Cousins, P. D., Lawson, B., Petersen, K. J., and Fugate, B. (2019).Investigating green supply chain management practices and performance. *International Journal Operational Production Management*. 21, 1803–1815. doi: 10.1108/IJOPM-11-2018-0676

Diabat, A. and Govindan, K. (2011), "An analysis of the drivers affecting the implementation of green supply chain

management", *Resources, Conservation and Recycling*, Vol. 55 No. 6, pp. 659-667

Dillman, D.A. (2000), Mail and Internet Surveys: The Tailored Design Method, Wiley & Sons, New York, NY.

Famiyeh, S., Adaku, E., Kwasi, A.-G., Disraeli, A.-D.and Charles, T.A. (2018), "Environmental management practices, operational competitiveness and environmental performance: empirical evidence from a developing country", *Journal of Manufacturing Technology Management*, Vol. 29 No. 3, pp. 588-607.

Farrukh, M., Sajid, M.., Lee, Jason, Shahzad, Imran., (2019). The perception of corporate social responsibility and employee engagement: Examining the underlying mechanism. *Corporate Social Responsibility and Environmental Management.*27. 10.1002/csr.1842.

Freeman, R.E. (1994), "The politics of stakeholder theory: some future directions", *Business Ethics Quarterly*, Vol. 4 No. 4, pp. 409-421.

Garavan, T. Ullah, I. O'Brien, F. Darcy, C. Wisetsri, W Afshan, G & Mughal, Y. H (2022). Employee perceptions of individual green HRM practices and voluntary green work behavior: a signaling theory perspective. *Asia Pacific Journal of Human Resources.*1-25 https://.doi.org/10.1111/1744-7941.1234

Geng, R., Mansouri, S.A. and Aktas, E. (2017), "The relationship between green supply chain management and performance: a meta-analysis of empirical evidences in Asian emerging economies", *International Journal of Production Economics*, Vol. 183, Part A, pp. 245-258.

Green, K.W., Zelbst, P.J., Meacham, J. and Bhadauria, V.S. (2012), "Green supply chain management practices: impact on performance", *Supply Chain Management An International Journal, Vol*. 17 No. 3, pp. 290-305.

Hair, J. F. Jr., Sarstedt, M., Hopkins, L., and Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (pls-sem). Eur. Bus. Rev. 5, 105–115.

Hair, Joe & Hollingsworth, Carole & Randolph, Adriane & Chong, Alain. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management & Data Systems*. 117. 442-458. 10.1108/IMDS-04-2016-0130.

Hart, S. L. (1995). A natural-resource-based view of the firm. Acad. Manag. Rev. 20, 986–1014.doi: 10.5465/amr.1995.9512280033

Ionescu, L. (2021). Corporate environmental performance, climate change mitigation, and green innovation behavior in sustainable finance.Econ.Manag.Finan. Markets 16, 94–106. doi: 10.22381/emfm16320216

Julious, S.A. (2005) Sample Size of 12 per Group Rule of Thumb for a Pilot Study. Pharmaceutical Statistics, 4, 287-291. http://dx.doi.org/10.1002/pst.185

Khan, S. A. R., and Qianli, D. (2017). Impact of green supply chain management practices on firms' performance: an empirical study from the perspective of Pakistan. Environ. Sci. Pollut. Res. 24, 16829–16844. doi: 10.1007/s11356-017-9172-5

Khan, S. A. R., Zhang, Y., Anees, M., Golpîra, H., Lahmar, A., and Qianli, D. (2018). Green supply chain management, economic growth and environment: a GMM based evidence. *Journal of Cleaner Production*. 185, 588–599. doi: 10.1016/j.jclepro.2018.02.226

Koberg, E.; Longoni, A.A systematic review of sustainable supply chain management in global supply chains. *Journal of Cleaner Production*. 2019, 207, 1084–1098

Kovacova, M., and Lazˇ aroiu, G. (2021).Sustainable organizational performance, ˇ cyber-physical production networks, and deep learning-assisted smart process planning in industry 4, 0.-based manufacturing systems.

Economic Management Financial Markets. 16, 41–54. doi: 10.22381/emfm16320212

Kung, F.H., Huang, C.L. and Cheng, C.L. (2012), "Assessing the green value chain to improve environmental performance evidence from Taiwan's manufacturing industry", *International Journal of Development Issues*, Vol. 11 No. 2, pp. 111-128.

Luthra, S., Garg, D. and Haleem, A. (2016), "The impacts of critical success factors for implementing green supply chain management towards sustainability: an empirical investigation of Indian automobile industry", *Journal of Cleaner Production*, Vol. 121, pp. 142-158.

Luu, T. T (2018). Employees' green recovery performance: the roles of green HR practices and serving culture. J. Sustain. Tour. 26, 1308–1324. doi: 10.1080/09669582.2018.1443113

Malik, S. Y., Cao, Y., Mughal, Y. H., Kundi, G. M., Mughal, M. H., and Ramayah, T. (2020). Pathways towards sustainability in organizations: empirical evidence on the role of green human resource management practices and green intellectual capital. Sustainability.12, 3228.doi: 10.3390/su12083228

Malik, S. Y., Hayat Mughal, Y., Azam, T., Cao, Y., Wan, Z., and Zhu, H. (2021). Corporate social responsibility, green human resources management, and sustainable performance: is organizational citizenship behavior towards environment the missing link? Sustainability.13, 1044.doi: 10.3390/su13031044

Mardani, A., Kannan, D., Hooker, R. E., Ozkul, S., Alrasheedi, M., and Tirkolaee, E. B. (2020). Evaluation of green and sustainable supply chain management using structural equation modelling: a systematic review of the state of the art literature and recommendations for future research. *Journal of Cleaner Production*. 249, 119383.doi: 10.1016/j.jclepro.2019.119383

Maziriri, E. T. (2020). Green packaging and green advertising as precursors of competitive advantage and business performance among manufacturing small and medium enterprises in South Africa. *Cogent Business Management*.7, 1719586.doi: 10.1080/23311975.2020.1719586

Mughal, Y.H, Jehangir M, Khan M, Saeed M. (2020). Nexus between corporate social responsibility and firm's performance: A panel data approach. *International Journal of Finance & Economics*, 1–16. https://doi.org/10.1002/ijfe.1956

Nilsson, Fredrik & Göransson, Malin.(2021). Critical factors for the realization of sustainable supply chain innovations - Model development based on a systematic literature review. *Journal of Cleaner Production*. 296. 126471. 10.1016/j.jclepro.2021.126471.

Nunnally, J.C. (1978) Psychometric theory.2nd Edition, McGraw-Hill, New York.

Oskouei, Z. H. (2018) Linking social and economic responsibilities and financial performance: The assisting role of innovation for an oil engineering and development company. *International Journal of Finance & Economics* 24:1345–1354

Paul, A.; Shukla, N.; Paul, S.K.; Trianni, A. Sustainable Supply Chain Management and Multi-Criteria Decision-Making Methods: A Systematic Review. Sustainability 2021, 13, 7104. https:// doi.org/10.3390/su13137104

Pimenta, H. C. D., Ball, P., & Salonitis, K. (2021). Supply chain environmental and social sustainability practice diffusion: Bibliometrics, content analysis and conceptual framework. *Corporate Social Responsibility and Environmental Management*, 28(6), 1870– 1890. https://doi.org/10.1002/csr.2165

Podsakoff, P. M., Mackenzie, S. B., Lee, J.-Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied. Psychology*. 88, 879–903.

Podsakoff, P.M. and Organ, D. (1986), "Self-reports in organizational research: problems and prospects", *Journal of Management*, Vol. 12 No. 4, pp. 531-543.

Rao, P. and Holt, D. (2005), "Do green supply chains lead to competitiveness and economic performance?", *International Journal of Operations & Production Management*, Vol. 25 No. 9, pp. 898-916. https://doi.org/10.1108/01443570510613956

Ringle, C.M., Wende, S. and Becker, J.M. (2015) SmartPLS. SmartPLS GmbH, Boenningstedt.

Sarkis J (1999). "Methodological Framework for Evaluating Environmentally Conscious Manufacturing Programs." *Computers and Industrial Engineering* 36(4): 793-810.

Sarkis, J., Zhu, Q. and Lai, K.H. (2011), "An organizational theoretic review of green supply chain management literature", International Journal of Production Economics, Vol. 130 No. 1, pp. 1-15

Schmidt, C.G., Foerstl, K. and Schaltenbrand, B. (2017), "The supply chain position paradox: green practices and firm performance", *Journal of Supply Chain Management*, Vol. 53 No. 1, pp. 3-25

Shang, K., Lu, C. and Li, S. (2010), "Taxonomy of green supply chain management capability among electronics-related manufacturing firms in Taiwan", *Journal of Environmental Management*, Vol. 91 No. 5, pp. 1209-1217.

Shekarian E, Ijadi B, Zare A, Majava J. Sustainable Supply Chain Management: A Comprehensive Systematic Review of Industrial Practices. *Sustainability*. 2022; 14(13):7892. https://doi.org/10.3390/su14137892

Srivastava, S.K. (2007) Green Supply-Chain Management: A State-of-the-Art Literature Review. International *Journal of Management Reviews*, 9, 53-80. https://doi.org/10.1111/j.1468-2370.2007.00202.x

Suler, P., Palmer, L., and Bilan, S. (2021). Internet of things sensing networks, digitized mass production, and sustainable organizational performance in cyber-physical system-based smart factories. *Journal of Self-Gov. Management Economics*. 9, 42–51. doi: 10.22381/jsme9220214

Treece, E.W., &Treece, J.W. (1982). *Elements of research in nursing* (3rd ed.). St. Louis, MO: Mosby.

Van Belle, Gerald. (2008). Statistical Rules of Thumb.Wiley series in probability and statistics. 699. 10.1002/9780470377963.

Vanalle, R.M., Ganga, G.M.D., GodinhoFilho, M. and Lucato, W.C. (2017), "Green supply chain management: an investigation of pressures, practices, and performance within the Brazilian automotive supply chain", *Journal of Cleaner Production*, Vol. 151, pp. 250-259

Yong, J. Y., Yusliza, M. Y., Ramayah, T., Chiappetta Jabbour, C. J., Sehnem, S., and Mani, V. (2020). Pathways towards sustainability in manufacturing organizations: Empirical evidence on the role of green human resource management. *Business Strategy Environment.* 29, 212–228. doi: 10.1002/ bse.2359

Younis, H., Sundarakani, B. and Vel, P. (2016), "The impact of implementing green supply chain management practices on corporate performance", *Competitiveness Review*, Vol. 26 No. 3, pp. 216-245

Yusliza, M., Yong, J. Y., Tanveer, M. I., Ramayah, T., Faezah, J. N., and Muhammad, Z. (2020).A structural model of the impact of green intellectual capital on sustainable performance. *Journal of Cleaner Production*. 249, 119334.doi: 10.1016/j.jclepro.2019.119334

Zhu, Q., and Sarkis, J., and, Lai, K.-h. (2008). Confirmation of a measurement model for green supply chain management practices implementation. *International Journal Production Economic*. 111, 261–273. doi: 10.1016/j.ijpe.2006.11.029

Zhu, Q., Feng, Y. and Choi, S.B. (2017), "The role of customer relational governance in environmental and economic performance improvement through green supply chain management", *Journal of Cleaner Production*, Vol. 155, Part 2, pp. 46-53

Zhu, Q., Sarkis, J. and Lai, K.H. (2013), "Institutional-based antecedents and performance outcomes of internal and external green supply chain management practices", *Journal of Purchasing & Supply Management*, Vol. 19 No. 2, pp. 106-117.