

# Sustainable Supply Chain Management Practices and Firm Performance: Evidence from Small and Medium Enterprises of Pakistan

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**Abstract:** The purpose of this research is to demonstrate if sustainable supply chain practices can lead to a positive corporate performance. Usually in literature, research has emphasized internal efficiency over external effectiveness. This research explores two internal and two external management variables. Furthermore, the implications of Sustainable Supply Chain Management incorporation as regards to its related internal and external practices have not been explored in the literature with regards to developing countries and small and medium enterprises context. It is also noted that recognition of the economic benefits obtained from sustainability programs implemented can have great managerial and practical implications but needs more evidences. SEM PLS approach is used for analysis whereby a theoretical model is adapted from previously published research. A purposive multi-industry approach to sampling was adopted to select environmental friendly firms. After validity and reliability of data, the sample was analysed using structural equation modelling for relationship effects. Firms can learn from the results to align their stance towards sustainable advancements as a competitive advantage.

**Keywords:** Sustainable supply chain management, structural equation modelling, sustainable advancement, competitive advancement, Small and Medium Enterprises.

## 1. Introduction

Sustainability is “a method that produces long-term investor value through possibilities and risk management derived from economic, environmental and social progress” [1]. “Sustainable supply chain management handles inventory, information, capital flow, and the collaboration between companies across the supply chain, while at the same time pursuing sustainable development goals from all three dimensions” [2]. It is not just a single financial accountability [3]. In today’s world, industrialization is important part of progress, but renewable resources should not be over exploited by companies while trying to maximize production, in doing so there are negative consequences [4]. Fast growth and development are now paired with by rising certain risks [5]. Supply chain’s role is therefore becoming more important, because they handle operation and production [6]. Businesses now know that it is time to better align supply chains [7].

These sustainable businesses utilize as few resources and re-use as well [8]. For solution of the problem of over-exploitation and over-production activities, businesses can apply triple bottom line accountability. This concept creates harmony between the three dimensions of sustainability. Now numerous businesses publish sustainability reports of environmental and eco-friendly managerial performance [9]. But little is known if sustainability truly pays. There is more need to figure out what are the outcomes of sustainability for businesses. Thus, this research examines sustainability in two subsections of management internal and external management activities in relation with a triple bottom line variable.

## 2. Literature Review

The literature points to a lot of attention on environmental problems [10]. And Sustainable supply chain can help reduce environmental damage and stimulate economic growth and good corporate image [11]. Due to environmental issues, stakeholders hold companies accountable for their actions [12] and in return these companies are seeking goods that are less harmful for the environment. Thus, these external pressures from stakeholders implore firms to use activities that are not destructive but instead they are sustainable and are looking into circular economies [13].

We can state from the study that the firms adopted the Sustainable Supply Chain, when demands like curbing harmful actions and making efforts for the betterment of the environment are increased. This pressure takes effect when governments make the employment of the environmental standards compulsory. But a sustainable supply chain also needs internal commitment from businesses [14]. Previous research hints that embracing sustainability can deliver environmental efficacy and economic benefits. Researchers are also exploring to whether adoption of sustainability is paying off for firms [15]. The implications of sustainability on firm performance have been researched but sometimes the results are not unanimous [16].

We assume that previous work in sustainability is extensive but there is ambiguity in establishing relation among the application of sustainability strategies along with the success

state of a firm, especially in the perspective of developing countries.

### 3. Theory and Hypotheses Development

#### 3.1 Stakeholder Theory

Stakeholder theory states that certain stakeholders are responsible towards the distribution of sustainability in the supply chain such as demands of the consumers or the pressures from the governments [17]. This contributes in the growth of the defensible supply chain [18].

#### 3.2 Resource-Based View

The Resource-Based View positions in the Sustainable Supply Chain Management that sustainability related proficiency and information results in economic welfare of the companies [19]. This theory makes the base of our constructs namely “supplier collaboration” and “supplier monitoring and assessment”.

#### 3.3 Resource Dependence Theory

In the previous publications, it has been indicated that there is an immediate effect of the interdependence of the buyers and suppliers and the effectiveness that they show in their activities. The aggregate performance of Sustainable Supply Chain has been largely affected by this relation and dependency [20]. This provides us with an important information about the usage of sustainability in the supply chains of many firms.

#### 3.4 Transaction Cost Economics

According to this theory, the charges, expenses and the impact of the supplier practices (whether ill or well practices) must be put into consideration by the firms as it might compromise their integrity. This theory offers base to implement the variable “supplier monitoring and assessment” in our research.

#### 3.5 Diffusion of Innovation

The theory of diffusion of innovation states that the Sustainable Supply Chain Management (SSCM) can be diffused by considering the activities of probable owners, acceptance of environment activities and its accomplishment. As an example, dissemination of ISO 14001 proves to be an effective and efficient pre-emptive and strategic progress [21].

### 4. Conceptualizing Research Framework

Researchers in [22] define certain management actions labelled as internal and external associating Sustainable Supply Chain with the firm’s performance. They conclude that employing Sustainable Supply Chain Management positively influences the businesses’ performance. To be exact, a variety of not only internal but also external practices of management as monitoring and collaboration that generates a system that enables utilization towards sustainability in Supply Chain Management.

### 5. Defining the Constructs

#### 5.1 Internal Management Practices Dimension

This research defines social and environmental aspects of firm’s internal practices. An efficient Supply Chain Management deems accomplishment of these factors to be very necessary.

##### 5.1.1 Environmental Management Practices Construct

Certain environmental practices are quality control, recycling of products and employing green design. [23-24] have shown that the implementation of environmental practices results on improved environmental proficiency. This construct has a necessary connection with the better performance results of firms. Hence, our first hypothesis can be defined as:

H1. The environmental management practices have a positive impact on social, environment, and economic performance of the firm.

##### 5.1.2 Social Management Practices Construct

We describe ‘Social Practices’ as a set of social activities such as SA8000. This construct is important because the concept of accountability and responsibility has become a significant issue of the society and it implies to firms and businesses as well. Thus, the compliance of these social activities ensures the welfare of the community and ensure social responsibility. An example of such activities is giving primary education to the community and health care services.

The operative presentation of companies can be increased, and risks can be lowered to make strengthen internal management so also social activities [25]. The effective implementation of the sustainable internal management actions guarantees success and evades solemn incidences of negligence of social responsibility. Hence, second hypothesis is:

H2. The Social management practice of firms has a positive impact on social so also environmental and economic performance.

#### 5.2 External Management Practices Dimension

The most significant external member of Supply Chain Management is the supplier. The activities of this member disturb the firm performances the most. Hence, supplier assessment programs and entities are now being deployed in businesses to ensure long-term success.

##### 5.2.1 Supplier Collaboration Construct

Suppliers are being pressured now-a-days to cooperate with the firms and provide information about their activities. [26] clarify significant areas of supplier collaboration such as commitment, mutual respect, interaction and moral demeanor. One significant aspect of collaboration in sustainable supply chain management is making long-term relations between firms and their suppliers. [27] stated that firms can encourage making better ties with the suppliers if

supplier collaboration and management becomes one of the aspects of their strategic planning. It is noted that efficient supplier management is connected with substantial business advantage and profit of a firm [28]. By understanding this concept, we put forward our third hypothesis as:

H3. The collaboration of firm's suppliers has a positive effect on the social, environmental and also economic performance.

### 5.2.2 Supplier Monitoring and Assessment Construct

"Supplier management is an autonomous yet interconnected mechanism that parallels the process of selecting of suppliers" [29]. It should be emphasized that the suppliers must thoroughly describe their practices and it must be ensured that they comply with SA8000 which is about worker rights and their well-being. Certain studies investigated and theorized the agendas and concepts needed to promote the way suppliers and providers are to be chosen [30-31]. Thus, we define our fourth hypothesis as:

H4. The assessment and monitoring of supplier have a favorable influence on social, economic and environmental performance of the firms.

### 5.3 Sustainable Supply Chain Management Performance Construct as a Dependent Variable

Conventional performance evaluation criteria of a firm are unsatisfactory because they only measure the firm's financial well-being. In contrast, the Sustainable Supply Chain Management related performance measure criteria seems to be novel and offers a new prospect into performance evaluation [32]. In this environmentally degrading world, it has become imperative to assess the environmental proficiency as well as to limit the harmful effects businesses have on our environment. The same is highlighted by the notion in sustainable supply chain management as well as it emphasizes that along with economic evaluation the environmental proficiency of a firm must also be measures and assessed. The authors in [33] confirm that the practices in firm's Sustainable Supply Chain Management are positively connected towards their economic performance and [34] studied the productive businesses in thriving economies as well as infer the SSCM initiatives will definitely construct successful reverse logistics outcomes and also promote the productivity.

It is suggested that businesses must incorporate strategies to verify their processes and the evaluation of how sustainable supply chain management of a firms have been one of these evaluations. The successful Sustainable Supply Chain Management depends on how efficient supply chain of a firm is [35]. There should be sustainable partnerships to enhance the environmental productivity and capability. The literature shows the positive economic and social relations and effects when Sustainable Supply Chain Management related activities are deployed [36]. Thus, the enforcement of practices in Sustainable Supply Chain Management will improve environmental efficiency [37].

Previous studies demonstrate that the negative impact of the harmful environmental activities can be lowered by use of certain measures such as control on the usage of resources,

reduction of the usage of energy, inhibition of toxic products and limited waste product removal [38].

It should be noted that the ESE Performance construct of this research work not only characterizes the economic and environmental performance but also the social well-being and the safety of the workforces. Social performance is also taken account in the shape of certain scenarios such as corporate social responsibility, prospects representing the well-being of the community in terms of health and education.

## 6. Methodology

### 6.1 Sample and Data Collection

Self-reporting survey was used for data collection. Instruments were developed from previously validated instruments made by these authors [22], [23] and [37]. The respondents of this study were SME employees. An independent samples t-test was carried out to test bias errors, and the study did not have any issues, as well as a Harman factor analysis done which was well under 50% variance for 1<sup>st</sup> factor hence no issues with common method bias were detected.

### 6.2 Data Analysis

To assess the relationships between variables Structural Equation Modelling (SEM) was used to determine the connectivity between the hypothesized variables. Specifically, SmartPLS tool was used.

## 7. Results and Discussion

### 7.1 Measurement Assessment of the Model

To get answer from questions, if measurement errors are under control, which measurement model was examined? The data quality was assessed and validity so also reliability, in addition to that before analysis into hypotheses is done. The measurement model in the table 1 indicates validity analysis of data.

"The loadings of reflective indicator a indicate if item is a measure of goodness of the latent construct [38]. "Cronbach alphac evaluates uni-dimensionality of a set of scale items. It's a measure of extent to which all variables in scale are positively related to each other" [40].

The evaluation of Convergent reliability through average variance expected (AVE)b alike variance described into the factor analysis. Internal stability has been examined in similar way of the Composite Reliability (CR)d; "it measures the reliability of indicators" [41].

Table.1. Validity and Reliability

Construct	Items	Loadings <sup>a</sup>	AV E <sup>b</sup>	CR <sup>d</sup>	Rho _A <sup>c</sup>	Cronbach's Alpha <sup>c</sup>
<b>ESE Performance</b>	EcPer1	0.700	0.497	0.854	0.816	0.802
	EcPer2	0.708				
	EcPer5	0.544				
	EcPer6	0.701				
	EnPer4	0.800				
	SPer2	0.752				
<b>Environmental Practices</b>	EP1	0.589	0.565	0.865	0.816	0.805
	EP2	0.844				
	EP3	0.804				
	EP4	0.750				
	EP5	0.746				
<b>Social Practices</b>	SP1	0.801	0.533	0.819	0.714	0.705
	SP2	0.760				
	SP3	0.633				
	SP4	0.717				
<b>Supplier Collaboration</b>	C1	0.690	0.552	0.88	0.847	0.837
	C2	0.779				
	C3	0.663				
	C4	0.783				
	C5	0.805				
	C6	0.727				
<b>Supplier Monitoring</b>	M1	0.655	0.515	0.841	0.762	0.762
	M2	0.722				
	M3	0.769				
	M4	0.766				
	M5	0.666				

Cross Loading criterion [42] subjective independence can support to reduce the existence of multicollinearity in number of the latent variables. Cross loadings (in bold) concerning an accompanying loading of construct has to be significant in each and every row of the item. The presence of cross loadings that exceed the indicators outer loadings identified as a discriminant validity issue [43]. The indicator item in table 2 shows Cross Loading.

Table.2. Item Cross Loading

Items	ESE Perf.	Env. Prac.	Social Practices	Supplier Collab.	Supplier Mon. & Assess.
Ecper 1	<b>0.700</b>	0.359	0.451	0.554	0.541
Ecper 2	<b>0.708</b>	0.411	0.423	0.412	0.482
Ecper 5	<b>0.544</b>	0.109	0.226	0.185	0.157
Ecper 6	<b>0.701</b>	0.407	0.230	0.218	0.250
Enper 4	<b>0.800</b>	0.438	0.286	0.391	0.385
Sper2	<b>0.752</b>	0.350	0.596	0.393	0.393
EP1	0.339	<b>0.589</b>	0.305	0.436	0.322
EP2	0.374	<b>0.844</b>	0.416	0.518	0.460
EP3	0.439	<b>0.804</b>	0.347	0.423	0.436
EP4	0.445	<b>0.750</b>	0.341	0.438	0.496
EP5	0.279	<b>0.746</b>	0.272	0.562	0.466
SP1	0.461	0.431	<b>0.801</b>	0.514	0.581
SP2	0.399	0.426	<b>0.760</b>	0.632	0.587
SP3	0.375	0.262	<b>0.633</b>	0.168	0.183
SP4	0.389	0.186	<b>0.717</b>	0.468	0.403
C1	0.351	0.575	0.356	<b>0.690</b>	0.553
C2	0.511	0.473	0.549	<b>0.779</b>	0.593
C3	0.364	0.350	0.477	<b>0.663</b>	0.450
C4	0.412	0.337	0.549	<b>0.783</b>	0.639
C5	0.383	0.524	0.450	<b>0.805</b>	0.667
C6	0.390	0.534	0.339	<b>0.727</b>	0.603
M1	0.429	0.435	0.547	0.494	<b>0.655</b>
M2	0.384	0.420	0.366	0.613	<b>0.722</b>
M3	0.391	0.457	0.395	0.583	<b>0.769</b>

M4	0.422	0.454	0.434	0.612	<b>0.766</b>
M5	0.393	0.318	0.435	0.519	<b>0.666</b>

“The diagonals are the Square root of the average variance extracted and should be highest in any row or column”. The vertical collinearity or even discriminant validity of variables are used to find in this test [39 ,42]. The correlations of the Latent Variable as well as square roots of the average variance have been taken out in Table 3.

Table.3. Fornell and Larcker Criterion

	ESE Perf.	Env. Prac.	Social Prac.	Supplier Collab.	Supplier Monit.
ESE Performance	<b>0.705</b>				
Environmental Practices	0.513	<b>0.752</b>			
Social Practices	0.558	0.453	<b>0.730</b>		
Supplier Collaboration	0.549	0.623	0.618	<b>0.743</b>	
Supplier Monitoring	0.566	0.584	0.612	0.787	<b>0.717</b>

7.2 Assessment of the Structural Model

The path coefficients have been examined to assess the PLS structural model and their statistical significance. Furthermore, Variance Inflation Factor, Cross Loading criterion, and Average Variance Extracted were assessed. To assess whether factors are correlated to each other the Variance Inflation Factor (VIF) have been used. VIF has to be <5. The Variance Inflation Factor (VIF) of 10 on greatest size of VIF [43] and 5 as the highest level of VIF [44]. “The occurrence of a VIF greater than 3.3 is proposed as an indication of collinearity, or common method bias issues”. Table 4 mentioned the collinearity figures in the inner model.

Table.4. Collinearity Statistics

Environmental Practices	1.705
Social Practices	1.741
Supplier Collaboration	3.135
Supplier Monitoring	2.906

The variance of 43% has been explained in the model. The higher quantity of sample size is required in the model and additional variables need to be included in future studies. Table 5 shows R<sup>2</sup> values.

Table.5. Coefficient of Determination

Endogenous Variable	R <sup>2</sup>
ESE Performance	0.43 or 43%

H1 highlights the T-value and P-value such as (2.936) and (0.003) respectively, which are significant to take alternative hypothesis, that is the Environmental practices (EP) along with ESE Performance indicates a positive correlation between the variables, with an extent effect (0.03) slightly.

The H2 highlights T-value and P-value such as (3.954) and (0.00) respectively, in which impact of Social Practices (SP) the independent variable on ESE Performance the dependent variable is significant positively to accept alternative hypothesis that is a relationship is of feeble magnitude between the variables (0.08). Empirically, it is worth noting that SMEs are exceptionally aware of social so also environmental activities and sustain these practices. Table 6 shows the direct effect relationship observation of Hypothesis 1 and 2.

Table.6. Direct Effects of Relationships between Hypothesis 1 and 2

Hy p.	Relation	Std Beta	Std Err.	t-value	P-value	Decision	5% CI LL	95% CI UL
H <sub>1</sub>	EP ->							
	ESE Perf.	0.221	0.073	2.936**	0.003	Supported	0.098	0.337
H <sub>2</sub>	SP ->							
	ESE Perf.	0.294	0.073	3.954**	0.00	Supported	0.175	0.415

H3 indicates T-value (0.66) and P-value (0.511) in which a non-significant relationship between the Supplier collaboration (C) independent variable and ESE Performance. The alternative hypothesis was not achieved successfully in this study. The results of hypothesis show lack of business collaboration strategically on issues of the environmental and social practices, consequently, insufficient in diffusion in practices of Sustainable Supply Chain Management.

H4, is significant enough that is T-value (1.652\* one tail data) and P-value (0.049) to indicate the impact of the independent variable the Supplier monitoring(M) on the ESP Performance the dependent variable that is significant to accept alternative hypothesis, there is a little magnitude relationship between variables (0.028). Table 7 indicates the direct impact relationship observation of 3 and 4 Hypothesis.

Table.7. Direct Effects of Relationships between Hypothesis 3 and 4

Hyp.	Relation	Std Beta	Std Error	t-value	P-value	Decision	5% CI LL	95% CI UL
H <sub>3</sub>	C -> ESE Performance	0.099	0.115	0.66	0.51	Not Supported	-0.085	0.292
H <sub>4</sub>	M -> ESE Performance	0.205	0.123	1.652	0.049	Supported	-0.016	0.391

7.3 PLS Structural Model Results

Research model in SEM PLS, shows 4 exogenous variables, (Environmental Practices), (Social Practices), (Supplier Collaboration) and (Supplier Monitoring & Assessment) and one endogenous variable (ESE Performance). Figure 1 shows the outer model shows item loadings and t-values in parenthesis, inner model values are path coefficients and p-values in parenthesis.

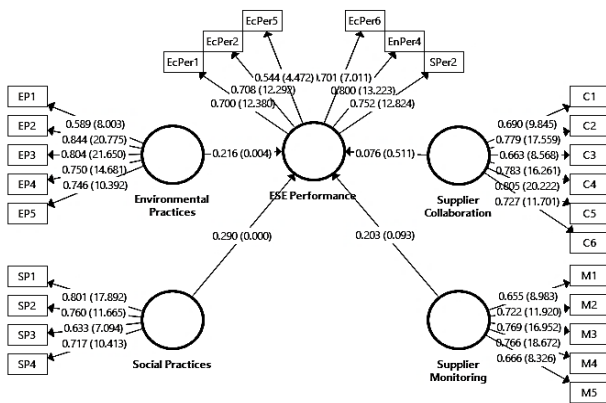


Figure.1. SEM PLS Model

7.4 Discussion

Environmental performance results show that it is increased by environmental practices [37], [41], [23], [45-48]. [49] demonstrates that an environmental strategy plays important role in sustainability. [50] shows that recycle and return and reuse of materials has relation to competitive advantage. [51] studied environmental and economic associations are positive and reflect same as this research’s results. From empirical results social management practices are positively associated with corporate performance and it is same result for [37] and [17]. Authors in [52] suggested that social activities are positively related to social performance. The results in this study is also that social activities and practices are positively related to corporate performance. Our findings confirm the same. According to authors in [53] collaboration improves environmental performance. The small and medium enterprises that we studied, lack evidences that collaboration is positively associated with corporate performance.

8. Conclusions and Future Work

The goal of our research was evaluating what should be the impacts of overall (internal and external) practices that a firm carries out and what becomes of its sustainable activities. We employed the concept of triple bottom line in this study. We

studied if sustainable practices pay off or in other terms, if adoption of sustainability had any influence on corporate performance. It is seen in this work that the sustainable management practices of SMEs eventually suggest improvement in firm’s success evaluation. It was found that internal environmental as well as social management practices of the firms have been a positive impact on the environmental capability of the firm. It is proved from this research that the environmentally friendly products and services promote corporate performance and operational efficiency and that social responsibility produces a good corporate image, and sustainable firms even promote health and education within the surrounding community as well for employees, which in turn gives a boost to firm’s performance in economic and intangible benefits. With regards to external management practices, it is noted that companies must perceive a mutual responsibility to one another, and the supplier monitoring as well as assessment has a positive impact on corporate performance, employee safety and community welfare. Having supplier’s actions accountable for environmental and social damage also translates to firm performance in the long run. Changing suppliers is costly, and firm performance is increased by selecting environmentally and socially responsible suppliers. Sustainable supply chain attracts global investors and hence also increases firm performance. There were suggestions that firm size affects adoption of sustainability, this study shows that even smaller companies have the awareness and will to be sustainable. These small and medium enterprises can also play a role in sustainability achievement and it was noted that they were also involved in recycling, re-use and reverse logistics. They also considered the implementation of social and economic aspects in their business processes. Enhanced firm performance has been seen and that too for small and medium enterprises in a developing country. Thus, this research work provides solutions to many environmental problems and contribute to sustainable development goals. It improves the decision-making capability of a firm. It assists in creating a comprehensive strategy by taking into account all the required environmental and social activities and aids in developing, enhancing and disseminating the newly thriving theory of Sustainable Supply Chain Management in businesses. For future work, sustainability study needs to explore new 4.0 industry and circular economy dimensions.

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