


## Article

# Organizational Culture and Environmental Performance

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**Abstract:** Because it has become more and more urgent for organizations to implement environmental strategies with the support of organizational culture, this study considers it necessary to conduct an empirical study to examine the impact of organizational culture on environmental performance. Synthesizing the perspectives of organizational culture and environmental performance, we applied a theoretical model in the manufacturing industry of Pakistan linking an organizational culture that supports environmental practices for better environmental performance. Based on a survey of 314 manufacturing firms, using Smart-PLS, the current study found that adaptability, mission and consistency positively affect environmental performance. However, involvement does not have an effect on environmental performance. Additionally, organizational culture as a latent variable has a strong impact on environmental performance. The study is one of the first, to the author's knowledge that links OC and EP in a developing economy, in this case Pakistan.

**Keywords:** organizational culture; environmental performance; manufacturing industry; sustainability

## 1. Introduction

The rapid development of industries in recent years has created problems of environmental degradation. To understand and quantify the relation between industrial development and environmental deterioration, many researchers have developed different theoretical frameworks and models including studies concerning organizational culture (OC) and environmental performance. However, it is important to substantiate these frameworks with empirical evidence [1]. Previous researchers have emphasized the organizational culture (OC) and its significance to many aspects related to a firm's performance in terms of job satisfaction, productivity, employee turnover, adoption of environmental activity management [2,3], or effect on performance measurement systems [4]. However, there has been less emphasis on the importance of organizational culture in developing a firm's environmental performance. Current literature on OC and sustainability has largely been based on case studies rather than on empirical data. This study, however, intends to fill the existing gap by adopting an approach with a quantitative framework based on resource-based view (RBV) theory to address the importance of OC regarding environmental performance.

These days, firms are facing environmental regulations because of their activities creating serious environmental issues. Many firms are forced to manage and reduce their ecological footprint to enhance their environmental performance. In this sense, there is little research on the antecedents of environmental performance of companies [5–7]. The above-mentioned studies confirm that increasing market share, improving the corporate reputation, leveraging production costs and competitive pressure can result in environmental strategy. They also are mostly grounded on

the institutional and internationalization theories to explain the factors urging firms to increase their environmental performance. In this regard, one area of weakness in the literature is the lack of research connecting organizational culture to environmental performance: in other words, organizational phenomena (e.g., norms and values) not explicitly considered by environmental management researchers [8,9]. Moreover, there is limited theoretical explanation using OC as an internal leading factor of environmental performance.

The theories developed hitherto, as mentioned above, have their focus more at the macro level. However, for greater micro-level understanding, research must be grounded on theories that mostly center on individual internal firm factors and their contribution to the companies' objectives. Furthermore, the previous studies mostly have established their results by combining different levels of analysis in their empirical research. These studies have not provided sound results in terms of empirical research because their findings do not include micro firm-level analyses and research. Therefore, there is a need to study at the firm level using the company and employee norms and values relating to green practices. It is important for companies to consider the internal micro-level factors that guarantee the firms' enhanced environmental performance. As such, OC role must be more empirically tested [10,11]. Existing research confirms that, based on the RBV, OC helps to organize resources in achieving firms' environmental management goals. Despite growing research interest in the importance of environmental performance that brings efficiency, however, the understanding of the relationship between OC and environmental performance is still very limited.

OC plays a fundamental part in the shift towards sustainability and environmental practices. Implementation of sustainable practices needs proper embedding of OC [12]. Based on this viewpoint, followers of resource-based view (RBV) theory, OC strategically provides an appropriate source of competitive advantage [13–15] and lead to the environmental performance of the firm. Extending this notion, RBV theory predicts it as a resource-bundle—valuable, rare and inimitable—that can be deployed through organizational capabilities [16,17]. From the perspective of RBV theory, an organizational culture that supports the environmental performance is not a common in the market and if the environmental aspect is added to the culture, therefore it can be a source of competitive advantage.

Pakistan's economy mostly depends on agriculture. However, recently, manufacturing and services have also emerged as major contributing sectors in the GDP. The manufacturing sector constitutes 13.3 percent of Pakistan's GDP and 14.2 percent of its total employed labor force [18]. With increasing industrial and agricultural events, energy demands, expansion of the population in cities, traffic concentration and population growth, degradation of all segments of the environment (air, water and land) is increasing at an alarming rate and remains a grave concern. The unsound management of chemicals, specifically in the manufacturing sector, has further compounded environmental issues [19]. The manufacturing sector in Pakistan generates significant environmental pollution that is reducing the quality of life. Such pollution includes a significant amount of fine and ultrafine particulate matter [20]. However, in the absence of environmental practices, manufacturing activities will create a significant amount of waste, exploit natural resources and overconsume energy. This calls for the development of OC that addresses the environmental issues in the manufacturing industry.

## 2. Literature Review

### *Organizational Culture and Environmental Performance*

OC is a very important variable that has an impact on the overall performance of the firm and impacts on firm's strategy and additionally its procedures, and, subsequently, the result of new product advancement ventures [21]. Denison and his research fellows [22–24] distinguished and validated four measurements of OC that are helpful for organizational performance: adaptability, consistency, involvement and mission. Adaptability suggests to the extent to which an organization can adjust conduct, structures and frameworks acquired in the wake of environmental changes. Consistency alludes to the degree to which beliefs, values and desires are held reliably by individuals. Involvement

alludes to the level of interest by an organization's individuals in the decision-making process. Mission alludes to the presence of a mutual meaning of the organization's purpose.

Many researchers have examined the relationship between OC and performance [2,25–28]. However, much uncertainty still exists about the relation between OC and EMCS and no previous study has investigated this phenomenon especially in the developing countries context. The main purpose of this study is to develop an understanding of OC values with the relationship of environmental performance. Mujeeb et al. [29] highlighted that the statistical examination demonstrates that participation of employees is highly associated with consistency and adaptability. Additionally, alternate measurements of OC have a positive association with performance measurement system.

Likewise, researchers have empirically demonstrated that OC is predictive of company performance [30]. For instance, Hartnell et al. [30] performed a meta-analysis of 84 studies and examined OC and employee attitudes, operational performance and financial performance. Hartnell et al. [30] found that OC was statistically significantly and positively correlated with operational and financial performance. Drawing on the resource-based view of the firm, environmental performance and economic performance are positively linked [31], current study argues that the relationship between OC also lead to the environmental performance.

The OC must be considered in this type of research to ensure the effective use of an environmental management system [32,33]. This is particularly true in the case of profit-driven firms and those that consider “green” or environmental tools for the purpose of legitimacy [34]. In this scenario, management that wishes to move toward improved environmental performance must have a learning environment in the organization that can adapt to changing conditions and information [32]. Two key elements in acquiring cultural change are top management commitment and the building of the staff's capacity and sense of ownership of the change. The change needed can come through top-down, bottom-up, or middle-up-down drivers. The style and ability of the leader will be helpful in allowing the change to happen in a way that is quite suited to the company at the time [34]. Researchers have discovered that change that happens slowly and incrementally may be more successful [35,36]. If the values of the company are shared by the employees, the latter will have a larger sense of job satisfaction. This has positive effects for the endorsement of environmental improvements through appropriate behavior.

Given the paucity of literature in this area, the aim of this research is to investigate the relationship between OC and environmental performance. The context for studying the relationship between OC and environmental performance is the manufacturing industry of developing countries. In the context of Pakistan, environmental performance is essential in the manufacturing industry.

### 3. Hypothesis Development

The importance of environmental practices in the company's culture demonstrates environmental values exist throughout the organization, which [37] defines as an element of business and environmental excellence. While focusing on the environmental strategy it is necessary, the strategy needs to be embedded into the firm's culture and daily practices [38]. Focusing on OC that supports the environmental practices will help manufacturing industry to improve the performance and gain the competitive advantage. Improved industrial environmental performance is essential for manufacturing industry to be competitive in export markets like the EU in which business customers demand high environmental compliance from their suppliers and often require certification to international standards, such as ISO 14001. Pakistan is behind its competitors in export markets with respect to environmental management.

Researchers have regarded inattention to OC as the prime reason for the implementation failure of organizational change programs [39]. Many have argued that despite changes in technology and systems, the fundamental cultures of organizations remain the same [40]. However, the cultural values of an organization supporting environmental practices help firms to develop the culture that supports such practices. A proactive approach would help firms to support environmental practices and to

apply newly developed OC. Firms that fail to develop sustainable values in culture may perform poorly. Therefore, proactivity helps organizations to translate an environmental strategy into an action. This needs a high degree of employee involvement, adaptability, consistency and a clear mission to guide the behavior of employees. Firms that have environmental supportive culture are better placed to perform well and to apply environmental OC values, thereby leading to an increased environmental performance. In summary, based on RBV theory, the current study used the sustainability approach [41] to test the relationship between OC and environmental performance in the manufacturing industry of Pakistan as an important factor in the success of efforts to reduce the company's environmental impact, which has been under-researched to date. Figure 1 explains the relations tested in current study. The remaining part of this section explains the hypotheses development.

### 3.1. *Involvement and Environmental Performance*

Denison et al. [24] found that high involvement of employees creates a sense of ownership and responsibility. This sense of ownership grows a greater commitment to the organization. The greater commitment increases firm productivity. Employee involvement practices not only enhance efficiency but also help to maintain the flow of sustainable practices for the firm. The high involvement of employees also provides useful ideas regarding the environmental strategy's routine tasks and activities. Thus, it leads to the environmental performance of firm [42–44]. As a result, the following research hypothesis is advanced

**Hypothesis 1 (H1).** *Involvement positively influences the environmental performance.*

### 3.2. *Adaptability and Environmental Performance*

In today's dynamic world, every firm is trying to cope with the frame of inconsistencies but it rapidly changes itself before the change will affect it. Adaptability is, thus, an important cultural variable. Schein [45,46] proposed that culture addresses two fundamental issues confronting firms: "the need to adapt to external changes and the need to provide internal integration. To promote adaptability, the norms that define OC need to promote flexibility, risk-taking and experimentation within the firm." Several studies have shown that OC with the characteristics of environmental values can enhance a firm's innovation and adaptation in that context [47]. Adaptability as a cultural value helps organizational members to promote their environmental-related responsibility capability, especially in a changing environment. It is argued that organizational adaptability is likely to impact the sustainability of a firm in the context of the manufacturing industry. In the socialization mode, the sharing of ideas among colleagues may increase when a firm welcomes new ideas regarding environmental performance and tries new approaches to sustainability. As a result, we develop the following hypothesis:

**Hypothesis 2 (H2).** *Adaptability positively influences the environmental performance.*

### 3.3. *Consistency and Environmental Performance*

According to Saffold [48], organizational effectiveness may be related to consistent and well-integrated internal governance systems. If the governance system reflects the environmental strategy, it creates a very well-established control system. Therefore, organizational consistency is measured as an important tool that can manage strength and internal integration through escalating environmental values, beliefs and assumptions [24]. The extant literature also found that organizational long-term sustainability is based on the achievement of organizational goals that require tangible and intangible resources that reflect sustainable practices. In addition, the consistency is a basis for a strong culture in which a firm builds an EMCS-based governance system on consensual support [49,50]. Based on these arguments, we advance this hypothesis:

**Hypothesis 3 (H3).** *Consistency positively influences the environmental performance.*

### 3.4. Mission and Environmental Performance

Another important aspect of the firm for sustainability is a mission. To align firm employees with the core idea about the environmental strategy and shared principles, the firm's mission can be an influential document that creates balance between the components of a formal system of corporations. It helps to drive the activities of firm employees and can be used to direct, evaluate and monitor their performance. (Bryson [51], p. 11) indicated that "mission statements, if not integrated into a rational practice or set of practices along with mental activities, strategic activities, tacit knowledge and emotions are 'things' or 'artifacts' that do not necessarily produce positive results." Hence, this argument categorically endorsed our conviction to suggest a hypothesis that the firm mission has a statistically significant impact on the environmental performance of the firm. Because firms design their mission statements in line with employees' mental activities and this interconnectivity leads them to produce environmental, social and economic performance [9]. Therefore, this lead to following hypothesis:

**Hypothesis 4 (H4).** *Mission positively influences the environmental performance.*

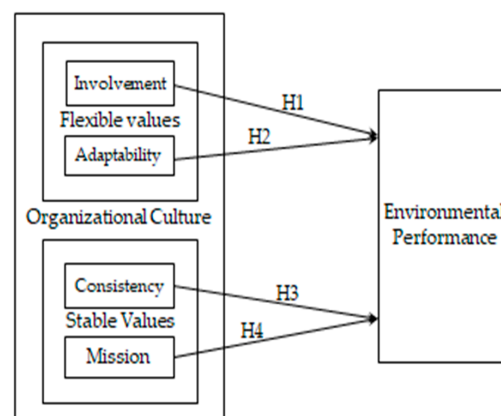


Figure 1. Research Model.

## 4. Materials and Methods

### 4.1. Data Collection

Pakistan's economy mostly depends on agriculture. However, recently, manufacturing and services have also emerged as major contributing sectors in GDP. The manufacturing sector constitutes 13.3 percent of Pakistan's GDP and 14.2 percent of its total employed labor force [18]. With increasing industrial and agricultural events, energy demands, expansion of population in cities, traffic concentration and population growth, degradation of all segments of the environment (air, water and land) is increasing at an alarming rate and remains a grave concern. The unsound management of chemicals, specifically in the manufacturing sector, has further compounded environmental issues [19]. The manufacturing sector in Pakistan generates significant environmental pollution that is reducing the quality of life. Such pollution includes a significant amount of fine and ultrafine particulate matter [20]. However, in the absence of environmental practices, manufacturing activities will create a significant amount of waste, exploit natural resources and overconsume energy. This calls for the development of OC which addresses the environmental issues in the manufacturing industry.

This study has targeted the manufacturing sector of Pakistan which, according to the Pakistan Federal Bureau of Statistics, is 6417 firms. According to the Census conducted by Federal Bureau of Statistics, there are 6417 manufacturing firms existed in Pakistan. These comprised of 72 districts in

four provinces across Pakistan. Among them, ten districts contain the major clusters of manufacturing industry with 3906 firms (61%), namely, Karachi, Hyderabad, Faisalabad, Lahore, Shiekhupura, Sialkot, Peshawar, Lasbela. Using the cluster sampling technique, previously adopted by such as [52], these ten major districts were selected for this study. Table 1 provides demographic data about the sample structure.

A simple random used to collect data. Random sampling provides each firm with an equal chance to be selected as the sample object of the study [53]. In addition to that, systematic random sampling offers generalizability and less bias [53]. 1500 firms were selected from 3906, because it was expected to get 20% response rate, as it common for social science studies [54], as well as fulfill the number of 300 sample size recommended by Hair et al. [55] to proceed with SEM. Hair, Hult, Ringle, & Sarstedt [56] and Hair, Celsi, Ortinau, & Bush [57] suggested that the sample size should be increased in order to reduce error [54] and to handle the non-response issue.

Out of 1500 questionnaires, 354 questionnaires were received and the final sample was 314 used for analysis. Thus, the final response rate was 20.9% which is similar to other management accounting studies [58]. Data were collected through the questionnaire survey by targeting key informants, a technique consistent with the literature [59]. The targeted respondents were Chief Executive Officer (CEO), Chief Financial Officer (CFO) and Finance Director. These informants normally control overall environmental activities in the firm and were likely to be well informed about their firm's strategies.

**Table 1.** Demographic data ( $n = 314$ ).

Demographic Variables	Category	Frequency	Percentage (%)
Type of Industry	Textile	130	41.4
	Leather	26	8.3
	Chemicals	35	11.1
	Automobile	11	3.5
	Steel	6	1.9
	Food and Beverage	31	9.9
	Others	75	23.9
Number of years since establishment	1–5 years	18	5.7
	6–10 years	34	10.8
	11–20 years	84	26.8
	21–50 years	162	51.6
	51 years and above	16	5.1
Number of full-time employees	50–100	53	16.9
	101–200	53	16.9
	201–300	35	11.1
	301–400	41	13.1
	401–500	22	7.0
	More than 500	110	35.0

#### 4.2. Measures

We measured the variables through adopting existing scales that have been validated in previous studies. All the measures were undertaken using seven-point Likert scales as follows: OC: 1 (strongly disagree), 4 (neutral) and 7 (strongly agree); and Environmental Performance: 1 (much worse), 4 (neutral) and 7 (much better). OC was used as an independent variable, measured with the four traits initially developed by Denison and Mishra [54] and further used in a study by Fey and Denison [23]. OC comprises flexibility (involvement and adaptability) and stability (consistency and mission), which is the premise for the model based on the Denison OC Survey. The instrument contained 36 items. Environmental performance, comprising 14 items adapted from an instrument initially developed by Sharma and Vredenburg [60] and later used by Henri and Journeault [61] (see questionnaire in Appendix A).



## 5. Results

### 5.1. Analysis

In general, there are two approaches to estimating the parameters of an SEM. One is the covariance-based approach (CB-SEM) and the other is the variance based (components-based) approach. During the last two decades, CB-SEM has received much attention to be modeled by different software such as COSAN, AMOS and LISREL. CB-SEM uses a maximum likelihood (ML) function to minimize the difference between the sample covariance and those predicted by the theoretical model when the data distribution is normal [62]. CB-SEM endeavors to estimate the parameters of the model through loadings and the path values to minimize the difference between sample covariance and those anticipated by the theoretical model [63]. Therefore, the stated parameter estimation process attempts to minimize the covariance matrix of the observed measures' overall fit [64]. Thus, based on that point of view, it can be mentioned that the focus of CB-SEM is more oriented towards testing a theory and best suited for confirmatory research [56].

On the other hand, another approach to SEM is variance-based Partial Least Square (PLS-SEM). PLS-SEM is particularly appealing when the research objectives focus on prediction and explaining the variance of key target constructs by different explanatory constructs [64]. PLS-SEM focuses on maximizing the variance of the dependent variable explained by the independent variable [65] rather than covariance (explanation of the relationship between items).

PLS-SEM is well-known to be used on highly skewed, nominal, ordinal and ration scale variables (Reinartz et al., 2009). In PLS-SEM, small number of sample size can be used [66]. Another important characteristic which can differentiate PLS-SEM from CB-SEM is that PLS-SEM readily incorporates both reflective and formative measures [56], whereas, for CB-SEM, measure should be reflective [67]. Lastly, based on the prediction, the philosophical distinction between the two SEM approaches is that CB-SEM is only applicable for theory testing, whereas PLS-SEM is applicable both for theory testing/confirmation and theory development [68]. Using partial least squares (PLS) Graph Version 3.2.6 [56], the authors obtained PLS estimates for both a measurement and a structural equation model (SEM). In this way, SEM has been decided for current study to look at the relationship of the path and loading between these variables. The PLS approach additionally is more proper for models that contain complex connections (i.e., numerous indicators, constructs and the relationship among variables). PLS concentrates on the forecast of a particular arrangement of hypothesized connections that amplifies the clarified fluctuation in the endogenous variables, like OLS regression models [66].

### 5.2. Descriptive Statistics

The mean value of all five variables ranged from 4.615 to 4.878 on a seven-point Likert scale, with the standard deviation ranging from 1.230 to 1.464. The mean values of all the variables were above the scale midpoint of 4 based on a one sample z-test. The Mission had the highest mean value of 4.815, while the Adaptability had the lowest mean value of 4.615. Dispersion values reported by the standard deviation indicated that the highest value of 1.464 was shown by adaptability and that the lowest value of 1.230 was shown by Consistency.

### 5.3. Measurement Model

The measurement model explains the relations between the variables and the indicators that make up each latent variable. In this study, reflective indicators are used in the measurement model. Using convergent and discriminant validity, construct validity was performed for reflective indicators to determine whether the indicators reflect the underlying construct.

The convergent validity of the reflective indicators used in the measurement model can be determined from the indicators' item loadings, composite reliability and average variance extracted (AVE), as shown in Table 2. Table 2 indicates that all the constructs in the measurement model fulfill the criteria for composite reliability when the value for each construct is greater than 0.70. The item

loadings of the reflective indicators exceed the minimum cut-off requirement of 0.60. The AVE of each construct is more than the 0.50 value recommended by Hair et al. [56].

After convergent validity, authors tested the discriminant validity using the Fornell and Larcker (1981) [69] criterion. The discriminant validity examines the correlations between constructs and identifies the potentially overlapping constructs. As described in Table 3, the current study found that the square roots of AVEs are greater in all cases than the off-diagonal elements in their corresponding row and column, signifying that the necessary discriminant validity has been accomplished. In sum, the measurement model confirmed the satisfactory requirements of convergent validity and discriminant validity (see Appendix B).

**Table 2.** Descriptive statistics.

Constructs	Items	Mean	Standard Deviation	Kurtosis	Skewness
Involvement	9	4.795	1.375	−0.38711	−0.197667
Adaptability	9	4.615	1.464	−0.63256	−0.210333
Consistency	9	4.681	1.230	−0.48133	0.09400
Mission	9	4.815	1.344	−0.76122	0.05878
Environmental Performance	14	4.624	1.461	−0.70592	0.03214

**Table 3.** Discriminant validity.

Construct		1	2	3	4	5
1	Adaptability	<b>0.885</b>				
2	Consistency	0.698	<b>0.844</b>			
3	Environmental Performance	0.643	0.767	<b>0.859</b>		
4	Involvement	0.685	0.843	0.736	<b>0.905</b>	
5	Mission	0.703	0.835	0.791	0.838	<b>0.902</b>

Note: diagonals (in bold) represent the square root of the average variance extracted (AVE), while the other entries represent the correlations.

#### 5.4. Structure Model

The structural model indicates the causal relations between the model's constructs, including the estimation of the path coefficients and the  $R^2$  value. The  $R^2$  value also verifies that the OC is an important precursor for the environmental performance, explaining 60.7 percent of the variance. The result for H1 ( $\beta = 0.063$ ,  $t$ -value = 0.925) indicates that involvement is not significantly related to environmental performance. However, H2 ( $\beta = 0.102$ ,  $t$ -value = 2.176), H3 ( $\beta = 0.283$ ,  $t$ -value = 3.699) and H4 ( $\beta = 0.423$ ,  $t$ -value = 5.249) have a positive, significant relation with environmental performance (see Table 4).

**Table 4.** Structure model.

Hypothesis	Relationship	Std. Beta	Std. Error	t-Value	$f^2$	$R^2$	Decision
H1	Involvement → Environmental Performance	0.063	0.068	0.925	0.004	0.670	Not Accepted
H2	Adapt → Environmental performance	0.102	0.047	2.176	0.013		Accepted
H3	Consistency → Environmental performance	0.283	0.077	3.699	0.053		Accepted
H4	Mission → Environmental performance	0.423	0.081	5.249	0.127		Accepted

#### Organizational Culture as Latent Variable

The introduction of OC as latent variable in the model strengthens the relationship between OC and environmental performance. The results proved that the OC has significant impact on environmental performance. Table 5 presents the strong impact and significant relationship of OC with environmental performance ( $\beta = 0.81$ ,  $t$ -value = 38.935).



**Table 5.** Structure Model (Organizational Culture (OC) as Latent Variable).

Hypothesis	Relationship	Std. Beta	Std. Error	t-Value	f <sup>2</sup>	R <sup>2</sup>	Decision
H	Organizational Culture → Environmental Performance	0.81	0.021	38.935	0.81	0.655	Accepted

## 6. Discussion

Several studies have confirmed the relationship between OC and firm performance, the present study extends this knowledge to determine the effect of four traits of OC on environmental performance. The most interesting finding was that out of four traits of OC, three showed significant positive association with the environmental performance. One unanticipated finding was that the impact of involvement on environmental performance which is contrary to the findings of Hanna et al. [70]. This research argues that employee involvement is vital environmental related activities; however, the relationship between involvement and environmental performance is not significant. The possible explanation could be the less involvement of employees in environmental related decisions. In order explain it further, Hofstede [71,72] explained the phenomenon of Pakistani national culture. Pakistan scores 55 on the power distance list, which demonstrates that management may not involve the lower level employees in environmental related decisions that lead to the insignificant result of involvement and environmental performance Overall, these findings may support one of the basic questions of many researchers: That the OC has an important influence on environmental performance. Empirically, this study is the first one to provide evidence for the impact of OC on environmental performance covering a large sample size of the firm from manufacturing industry of Pakistan.

However, adaptability supports firms to develop norms and beliefs that support environmental performance. Likewise, adaptability helps firms to change norms and beliefs that support environmentally friendly practices and translate firm performance. Adaptability proved to be a significant factor especially for developing countries, specifically in Pakistan. It explains the changes in the business environment would push the industry to adopt the environmental strategies. This would only be possible when firms are willing to adapt and avoid the uncertainty. Therefore, it can be concluded that employee adaptability representing the flexible values of OC is effective and strengthens the performance of a firm. The firm's mission can influence the formal corporate settings. It helps the firm to guide, direct, evaluate and monitor the activities of the employees. The results of the third and fourth hypotheses revealed that stable values of OC also relate to the environmental performance. This concept has been used previously in the research, however, in environmental accounting, this study empirically proved this phenomenon. Results affirm that consistency trait helps people to alter their behavior for better environmental practices. Moreover, it defines that strong environmental strategy can be the main control within the firm. The consistency helps the firm to adopt the environmental values, which may become the effective control system in terms of rules, procedures and regulations. The mission offers a path for employees regarding environmental strategy. The results further show that sharing the mission and vision of environmental strategy among the staff has a significant impact on its implementations and is an important OC factor for the better environmental practices. The clear vision gives employees a path to follow and understand the OC in a better way.

The positive relationship between OC and environmental performance implies that there is a strong and consistent set of beliefs with ethical codes that guide staff's behavior for environmental strategy in the manufacturing industry. The empirical evidence suggested that the internally consistent culture facilitates the structure of environmental practices, if the leadership of the firm support and encourage environmental practices and transfer the firm path into sustainability. Accordingly, goals, values and norms allow employees to access the key information and data regarding the environmental strategy, which is mandatory in the structured environmental control system. Therefore, the findings of current study infer that the 'guiding principle' or 'code of conduct' in the shape of core values also helps management in environmental strategy implementation by providing a clear direction for sustainability as a core strategy of the firm.

The coordination and integration of environmental strategy in Pakistani industry is very important phenomenon. The current study shows that coordinated tasks and activities do not only have an impact on the performance but it also activates workplace socialization in which people can easily record unorganized decisions into better environmental ideas. This would lead to better information, bridges between the old and traditional way of doing business into new and enhanced environmental friendly production process. The information which is easily accessible and culture that supports the environmental strategy not only encourages coordination and integration within all functional departments of the firm but it also improves the interaction and coordination within the firm.

Based on the RBV, organizational culture is hard to imitate; resources can hinder or foster the effect of other resources on the goals and objectives of companies. This integrated model can explain the relationships of predictors and environmental performance. Also, Denison's model of OC including involvement, adaptability, consistency and mission was used in this study. The results of this study confirm past research in the area of organizational green practices, which have mostly used the RBV as their main theoretical basis [73–75], and, with a contribution to theory, this study integrates RBV as a more comprehensive model that explains the relationship between all the studied variables of this research with a company's perceived environmental performance. Moreover, this integrated model using the RBV approach can explain the role of OC on the relationships proposed in the research framework. RBV states that the organizational related resource (i.e., organizational culture) has the potential to foster or hinder the accomplishment of specific programs to achieve the goals and objectives [41].

This research highlights on a quantitative analysis of the proposed model of Denison's OC for implementation of environmental management system using SEM. The PLS approach is an appropriate method for testing multi-path model. Methodologically it reduces the risk of common method bias by the implementation of Harman's single factor as suggested by Podsakoff et al. [76]. The study therefore also offers contributions to the literature on the use of PLS in studies of manufacturing industries of Pakistan.

## 7. Conclusions

This study makes three contributions. First, it demonstrates how companies align OC to develop an environmental culture that supports the environmental performance. Based on resource-based view theory, this study provides evidence that OC can be a distinct advantage, as literature suggested that for environmental practices it is essential to have a support from OC [13]. The importance of environmental practices in the company's culture demonstrates environmental values exist throughout the organization, which Štok, Markič, & Bertoneclj [37] defines as an element of business and environmental excellence. While focusing on the environmental strategy it is necessary, the strategy needs to be embedded into the firm's culture and daily practices [38]. The results indicated that when environmental issues are considered in OC, an environmental strategy is developed. Although these results seem to be intuitive, other studies have indicated that environmental strategies and external reporting are not always linked with firm changes that reflect such a strategy for example, [77], impact environmental strategies, demonstrating the importance of culture with regard to environmental performance. The result of current study suggests that OC may indeed have an impact on environmental performance.

Moreover, this research tested empirically the RBV idea of the role of OC to increase or decrease the effectiveness of an environmental strategy. Additionally, it has practical implications for practitioners in how to use their OC to improve their environmental performance.

**Author Contributions:** All authors contributed equally to this work. H.B.M. collected and drafted the paper; O.T.S. analyzed the data; H.J.A. and, A.F.S.H. reviewed related studies. All authors wrote, reviewed and commented on the manuscript. All authors have read and approved the final manuscript.

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**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

### PART 1

#### A: Questionnaire

1. My organization is engaged in:  
☐ Textile    ☐ Leather    ☐ Chemical  
☐ Automobile    ☐ Steel    ☐ Others (please specify)\_\_\_\_\_
2. Number of years since its establishment: \_\_\_\_\_
3. Number of full time employees: \_\_\_\_\_
4. ISO 14001 Certification: \_\_\_\_\_
5. Which category of ownership best fits your business?  
☐ Listed in Pakistan Stock Exchange    ☐ Privately owned in Pakistan  
☐ Multinational Corporation
6. In which area your firm is located: \_\_\_\_\_

#### B. Personal Information

1. Gender:  
☐ Male    ☐ Female
2. Age: \_\_\_\_\_
3. Education level: \_\_\_\_\_
4. Tenure of service:  
☐ Less than 1 year    ☐ 1–5 years  
☐ More than 5 years
5. You are engaged in the department related to:  
☐ Accounting and Finance    ☐ Environment    ☐ Others \_\_\_\_\_
6. What is title of your role: \_\_\_\_\_

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### PART 2: Organizational Culture

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The following sections consist of statements refers to perceptions concerning the cultural values within your organizations. To what extend you agree or disagree with the following statements.

(1 = strongly disagree; 4 = neutral and 7 = strongly agree).

#### A. INVOLVEMENT

##### I. Empowerment

Decisions are usually made at the level where the best information is available.	7	6	5	4	3	2	1
Information is widely shared so that everyone can get the information he or she needs when it is needed.	7	6	5	4	3	2	1
Everyone believes that he or she can have a positive impact.	7	6	5	4	3	2	1

##### II. Team Orientation

People work like they are part of a team.	7	6	5	4	3	2	1
This organization relies on team work, rather than hierarchy.	7	6	5	4	3	2	1
Teams are our primary building blocks.	7	6	5	4	3	2	1

##### III. Capability Development

This organization is constantly improving in practices compared with its competitors in many dimensions.	7	6	5	4	3	2	1
This organization continuous invests in the skills of employees.	7	6	5	4	3	2	1
The capability of people in this organization is viewed as an important source of competitive advantage.	7	6	5	4	3	2	1

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<b>B. CONSISTENCY</b>							
<b>I. Core Values</b>							
The leaders and managers follow the guidelines that they set for the rest of the organization.	7	6	5	4	3	2	1
There is a clear and consistent set of values in this organization that governs the way we do business.	7	6	5	4	3	2	1
This organization has an ethical code that guides our behavior and tells us right from wrong.	7	6	5	4	3	2	1
<b>II. Agreement</b>							
When disagreements occur, we work hard to achieve solutions that benefit both parties in the disagreement.	7	6	5	4	3	2	1
It is easy to reach consensus, even on difficult issues.	7	6	5	4	3	2	1
We often have trouble reaching agreement on key issues *.	7	6	5	4	3	2	1
<b>III. Coordination &amp; Integration</b>							
People from different organizational units still share a common perspective.	7	6	5	4	3	2	1
It is easy to coordinate projects across functional units in this organization.	7	6	5	4	3	2	1
There is good alignment of goals across levels of this organization.	7	6	5	4	3	2	1
<b>C: ADAPTABILITY</b>							
<b>I. Creating Change</b>							
This organization is very responsive and changes easily.	7	6	5	4	3	2	1
This organization responds well to competitors and other changes in the business environment.	7	6	5	4	3	2	1
This organization continually adopts new and improved ways to do work.	7	6	5	4	3	2	1
<b>II. Customer Focus</b>							
Customer comments and recommendations often lead to changes.	7	6	5	4	3	2	1
Customer input directly influences our decisions.	7	6	5	4	3	2	1
The interests of the customer seldom get ignored in our decisions. *	7	6	5	4	3	2	1
<b>III. Organizational Learning</b>							
We view failure as an opportunity for learning and improvement.	7	6	5	4	3	2	1
This organization encourages and rewards those who take risk.	7	6	5	4	3	2	1
We make certain that we coordinate our actions and efforts between different units in this organization.	7	6	5	4	3	2	1
<b>D: MISSION</b>							
<b>I. Strategic Direction &amp; Intent</b>							
This organization has long-term purpose and direction.	7	6	5	4	3	2	1
This organization has a clear mission that gives meaning and direction to our work.	7	6	5	4	3	2	1
This organization has a clear strategy for the future.	7	6	5	4	3	2	1
<b>II. Goals &amp; Objectives</b>							
There is widespread agreement about goals of this organization.	7	6	5	4	3	2	1
Leaders of this organization set goals that are ambitious but realistic.	7	6	5	4	3	2	1
The leadership has clearly stated the objectives we are trying to meet.	7	6	5	4	3	2	1
<b>III. Vision</b>							
We have a shared vision of what this organization will be like in the future.	7	6	5	4	3	2	1
Leaders of this organization have a long-term orientation.	7	6	5	4	3	2	1
Our vision creates excitement and motivation for our employees	7	6	5	4	3	2	1

**PART 3: Environmental Performance**

The following sections consist of statements refers to environmental performance with the support of organizational culture. To what extent you agree or disagree with the following statements. In comparison with the industry average, how would you describe the environmental performance of your business unit in terms of the following indicators?

(1 = much worse, 4 = Neutral, 7 = much better)

**Section A: Environmental Performance**

Reduction in material costs	7	6	5	4	3	2	1
Reduction in process/production costs	7	6	5	4	3	2	1
Reduction in costs of regulatory compliance	7	6	5	4	3	2	1
Increased process/production efficiency	7	6	5	4	3	2	1
Increased in productivity	7	6	5	4	3	2	1
Increased knowledge about effective ways of managing operations	7	6	5	4	3	2	1
Improved process innovations	7	6	5	4	3	2	1
Improved product quality	7	6	5	4	3	2	1
Improved product innovations	7	6	5	4	3	2	1
Organizational-wide learning among employees	7	6	5	4	3	2	1
Better relationships with stakeholders such as local communities, regulators and environmental groups	7	6	5	4	3	2	1
Improved employee morale	7	6	5	4	3	2	1
Overall improved company reputation or goodwill	7	6	5	4	3	2	1
Filters and controls on emissions and discharges	7	6	5	4	3	2	1

**Appendix B****Table A1.** Convergent validity.

Constructs	Measurement Items	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Involvement	INV1	0.930	0.972	0.976	0.819
	INV2	0.927			
	INV3	0.908			
	INV4	0.914			
	INV5	0.876			
	INV6	0.925			
	INV7	0.897			
	INV8	0.884			
	INV9	0.882			
Adaptability	ADP1	0.837	0.965	0.970	0.783
	ADP2	0.902			
	ADP3	0.920			
	ADP4	0.906			
	ADP5	0.880			
	ADP6	0.859			
	ADP7	0.890			
	ADP8	0.878			
	ADP9	0.890			
Consistency	CON1	0.845	0.949	0.957	0.712
	CON2	0.870			
	CON3	0.895			
	CON4	0.876			
	CON5	0.877			
	CON6	0.819			
	CON7	0.799			
	CON8	0.850			
	CON9	0.754			

Table A1. Cont.

Constructs	Measurement Items	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Mission	MIS1	0.925	0.971	0.975	0.813
	MIS2	0.912			
	MIS3	0.924			
	MIS4	0.888			
	MIS5	0.884			
	MIS6	0.896			
	MIS7	0.93			
	MIS8	0.891			
	MIS9	0.863			
Environmental Performance	ENP1	0.844	0.972	0.975	0.738
	ENP2	0.881			
	ENP3	0.828			
	ENP4	0.905			
	ENP5	0.906			
	ENP6	0.885			
	ENP7	0.872			
	ENP8	0.892			
	ENP9	0.905			
	ENP10	0.858			
	ENP11	0.799			
	ENP12	0.797			
	ENP13	0.834			
	ENP14	0.805			

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