Mediating Role of Environmental Commitment between Green Organizational Identity and Green Innovation Performance

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Abstract

Integrating environmental goals in a company's mission and strategies not only improves the company's image as a socially responsible organization but also help in gaining a leading position of first mover advantage. In today's era, due to the increasing pressures towards sustainability and pro-environment policies, organizations as well as governments are making efforts in this direction. The purpose of this study is to find out the role of organizations in following green practices such as green organizational identity and green innovation performance. The current study investigates the association between green organizational identity, environmental commitment, and green innovation performance. Moreover, we also investigate how environmental commitment mediates the relationship between green organizational identity and green innovation performance. Data from manufacturing organizations is taken, these are the companies registered with WWF Green office project. Following a quantitative approach, the hypotheses developed in the light of literature are tested using structural equation modeling (SEM). Result indicates that a complementary partial mediation exists between green organizational identity, environmental commitment, and green innovation performance. Moreover, this study also aims to help in comprehending to what extent organizations are focusing on the environment and how much they value both the environment and making their operations green.

Keywords: green innovation performance, environmental commitment, environmental vision, competitive advantage, green organizational identity, PLS-SEM.

1. Introduction

The depletion and scarcity of natural resources has been brought to the attention of various governments and legislative bodies. Those bodies now seek to protect the environment by regulating organizations and by managing their carbon and ecological footprints. Manufacturing and service sectors are now under pressure to proactively seek alternatives to scarce resources in their organizational processes. This, in turn, encourages the production of bio-mimicked products and a reduction in the use of natural resources. In this regard, the International Organization for Standardization, Kyoto protocol and sustainable development goals play an important role in prioritizing environmental management systems.

The Kyoto Protocol pays attention to changes in the climate, requiring its stakeholder to set targets and meet them annually. Whereas, sustainable development goals developed by the UN focus on improvising responsible production in organizations for the purpose of overcoming negative impacts on the environment during the consumption process (United Nations Sustainable Development, 2016). World Commission on Environment and Development (WCED) remarked earlier that societal, financial and environmental issues are those interconnected matters which are hard to be ignored (WCED, 1987). After 1987, the Western European region emerged as a leader in reduced greenhouse gas emission (GHE) compared to the Asian region. However, during the nineties, the entire Western European territory was recorded to be in excess of their required emissions because of increased population, and energy requirements, which consequently catalyzed climate change and pollution (United Nations Environment Programme, 2007).

Keeping the global issues associated with the environment in view, Pakistan is no exception. Pakistan's environmental issues i.e. air pollution; climate change, deforestation, and water pollution are escalating alarmingly due to an expanding economy and thriving population. Pakistan is currently experiencing the worst level of deforestation as forests are shrinking at the rate of 1 percent each year (Asgher, 2018). Significantly, on the other hand, improper sterilization and hygiene conditions constitute about 30 percent of the cost of environmental damages (Janjua, 2014). It is important to ensure the preservation of the environment and natural resources when moving towards economic growth, ignoring such issues will not only incur extra costs but will also destabilize countries who in the long run are aiming towards economic success (Michael et al., 2000).

A strategic fit between environmental goals and company's mission not only strengthens its image but also enables it to capitalize on its first mover advantage (Hardcastle, 2015). Such integration is being advocated by WWF Pakistan with the initiative of Green Office. Green Office intends to bring the benefits of environmental stability; cost savings (in terms of securing organizations from regulatory penalties); the lowering of 'global warming'; the education of employees on the benefits of being green; and the creation of a sense of security among organizational members. It asserts, in doing so, that these ideals are of more importance than economic gains. This initiative also helps in understanding how an organization interacts and collaborates with its surrounding environment (Green Office, 2010).

1.1 Key Concepts of Green Innovation Performance (GIP), Green Organizational Identity (GI) and Environmental Commitment (EC)

When it comes to the twofold objective of sustainability acquisition for the environment and business, it is important to bring innovation into the organizational processes and products. Hence, organizations have introduced various strategies in the form of green processes and green products which bear the capability of placing organizations into innovative and green positions (Yung et al., 2011). In regard to understanding the concept of environment and an enterprise, it has been identified that eco-sustainable products and services are handled by those organizations who are ecopreneurs, as described by Kirkwood & Walton (2014) that ecopreneurs are those who run their businesses in a "green style" by possessing green deliverables and services. They also undertake the green functions of reuse, waste reduction, energy preservation, and recycling (into their business activities). Kirkwood and Walton (2014) also explained that ecopreneurs are communicating with buyers and users through their deliverables and services and that their products are causing less damage to the environment**.**

Moving on to the second concept, innovation in organizations, Kemp and Pearson (2008) defined environmental innovations in products and procedures as the need to adopt newness for significantly bringing forward the purpose to reduce hazardous impacts on the environment. Kammerer (2009), on the other hand, elaborated it as controlling environmental impacts in every phase of the product life-cycle. Kammerer (2009) further defined 'technical environmental innovations' into two branches; product and process environmental innovation. Meanwhile, in the literature, scholars argued that less environmental degradation occurs in a process compared to the product itself, because disposing of a product in the right way is a bigger issue on another level, for example, the leakage of heavy metals from batteries. Organizations' internal factors i.e. corporate environmental ethics and external pressures are both important for inflating green innovations (Chang, 2011).

With regard to organizational identity theory, green organizational identity is defined as *"an interpretive scheme about environmental management and protection that members collectively construct to provide meaning to their behaviors"* (Albert & Whetten, 1985).

1.2 Research Objectives

In understanding and witnessing the evidence, whether all constructs -GI, EC, and GIP- are associated positively or not, this study has used a quantitative approach, i.e. a questionnaire survey method, for testing the research hypotheses. This study has selected those organizations which are practicing green management, green innovation, environmental commitment, and corporate social responsibility – or those at least claiming to do so – as the research object. Precisely, this study aims to validate the findings of the model proposed by Chang and Chen (2013) in the context of Pakistan. Precisely, following are the objectives of this study:

➢ To find out the relation between green identity and green innovation performance.
➢ To explore the role of green identity towards environmental commitment.
➢ To identify the relationship between environmental commitment and green innovation performance.

➢ To test the mediating role of environmental commitment towards the relationship between organizational identity and green innovation performance.

1.3 Significance

The features that differentiate this study from previous research are that this research is applied and has been carried out in the context of Pakistan. Also, there is dearth of research that have been conducted on green management perspective so far by taking into account the theoretical perspective in the context of Pakistan. Importantly, this study will help in comprehending to what extent organizations are focusing on the environment and how much they value both the environment and making their operations green. It identifies green marketing aspects, green promotions, and perceptions about images and identities. Results from this research not only test a phenomenon but give a reflection of Pakistan's manufacturing sector in terms of sustainable development and green management. With the increasing global pressure on environmental sustainability, Pakistan has also started to work on this initiative with firm determination. However, there is still a strong opportunity to lead this way to make organizations feel more green and sustainable and if top management starts to think this way then this may inculcate the green vision into middle and low level employees as well, eventually taking the organization to a whole new green level. Furthermore, this study empirically investigates the link between each variable, identifying their strength amid other variables being studied.

2. Literature Review

2.1 Organizational Identity from Viewpoint of Management and Stakeholders

To understand organizational identity, it is important to first define it in a singular frame. Many researchers claim that organizational identity and individual identity are in close association with each other (Scott & Lane, 2000). So, Scholars have defined it as the perception and understanding of an enterprise formed in an individual's brain (Dutton et al., 1994). Earlier researchers commented that 'organizational identity' and 'organizational image' are two different terms on the basis of a framework perspective, i.e. organizational image is identified as an assessment made about the organization from its outer frame, whereas organizational identity is defined as a cognition made about the organization from an inside party working in the organization (Gioia & Thomas, 1996).

The organizational image is defined by Dowling (2004) as the tendency of a firm to instill positive perceptions in its stakeholders. Lately, however, it has been identified and proposed that organizational identity comes in a collective frame with the passage of time from the dealings of groups inside and outside the organization. The stakeholder-manager perspective argues that organizational identity comes into existence from the collaboration of groups (managers and stakeholders) who are internal and external to the organization (Scott & Lane, 2000). Being focused on image and identity, Cronin et al. (2011) shed light on the importance of acquiring green practices for the enhancement of a company's image and loyalty. The extent of the company's focus on its green image depends upon the environment in which it is carrying out its operations. Many organizations re-established and revived their businesses through the incorporation of green practices. Louis Vuitton is an example of that revival. Nevertheless, it is more accurate to concede that organizations have survived by taking advantage of staying

environmentally focused (Dodes & Schechner, 2009).

Dougherty (1990) explains that organizational identity has the power to bring a likeness among individuals in the organization which results in the enthusiasm to innovate in satisfying customers. Albert et al. (2000) upgraded the concept in which organizational identity serves as a route for the understanding of partners and 'internal and external' shareholders about the functioning and interaction of an enterprise. As per organizational identity theory, organizations play an important role in making employees more aware of organizational activities and goals and with the increased emphasize on green management practices at global level, organizations have started to focus more on green identity principles (Albert et al., 2000; Xing et al., 2019). Green organizational identity proposes a concept in which organizational members maintain and align their conduct with environmental concerns and protection, and Chen (2011) states that green organizational identity is pivotal in understanding environmental concerns. Corley et al. (2006) suggest that organizational identity influences every activity of an individual employed in an organization, and it serves as a symbol for recognizing specific businesses. Identity and innovation are those concepts in eco-sustainability which helps organizations, businesses, and entrepreneurs to develop an understanding that being green does pay off in the form of survival for future generations. Fundamentally, Green Innovation conceptualizes those practices which exhibit concerns for the environment. Nonetheless, green practices involve costs. But the costs are negligible compared to the economic and social benefits which are achieved by organizations and the society in which an organization is operating (World Business Council for Sustainable Development, 1997).

Green innovation is a novelty in firm's actual processes which are more closely connected to the development of green products (Chen et al., 2006). Chen et al. (2006) split "green innovation performance" into "green product innovation performance" and "green process innovation performance". Thereby, elaborating "green product innovation performance" involves the embodiment of newness in a product, helping in the management and protection of the environment. In the same way, "green process innovation performance" incorporates novelty in the procedure, operation or technique which consequently leads towards environmental management. Talke et al. (2006) claim that firms who are willing to bring novelty into their organizations need to enhance their knowledge, skills, abilities, proficiencies and expertise as well. Hence, proficiencies and expertise are proven to affect "innovation success". Chen (2008) argued that environmental initiatives implemented by organizations to preserve the environment had a positive impact on their respective green identities. According to Song and Yu (2017), GI also mediates the relationship between green innovation and green innovation strategy. Thus, it is argued that GI could positively affect GIP. Moreover, according to Soewarno et al. (2019), organization identity play important role in improving the green innovative performance. The following hypothesis is suggested:

> **H₁:** Organizations with green identity innovate more in terms of green performance.

2.2 Interdependence of Green Organizational Identity and Environmental Commitment

Zelezny & Schultz (2000) identified environmental commitment as the ability and tendency of an individual to indulge in pro-environmental activities. McAllister and Studlar (1999) described it as the activities of an organization done with the intention of protecting the environment. Henriques and Sadorsky (1999) state that an organization is accepted as environmentally committed when it utilizes all of its sources and resources in protecting the environment. Companies are expected to work for the environment by solely devising activities and processes of production that are environmentally friendly, instead of only focusing on revenues and profit creation (Figge & Hahn, 2012). Net margins associated with environmental activities are dependent upon cultural aspects, industrial characteristics, and customers' willingness to pay for environmentally friendly products and services (Schaltegger & Synnestvedt, 2002).

Chen (2011) stressed that organizations must place emphasis on developing an organizational culture that promotes environmental concerns and acknowledges environmental importance. Anderson and Bateman (2000) state that these organizations are more likely to indulge in environment-saving activities with an increased level of environmental commitment in their organization. Wagner (2001) made it clear that it is wrong to say that bad environmental performance will not lead to extra costs upon the organization. Schaltegger and Synnestvedt (2002) came to the conclusion that in order to optimize environmental activities, organizations need to choose practices which do not exceed the cost of eco-friendly initiatives. Also, it is hard to ignore environmental impact if a company has incorporated environmental concerns in their identity (Sharma et al., 1999). Meeting the regulations of regulatory and legislative bodies is essential for organizations to keep their procedures and processes in check and helps in answering questions on how much and to what extent their processes are influencing environment (Hutchinson, 1992).

Surprisingly, organizational image has become crucial for customers and other shareholders in deciding brand loyalty, which has, in turn, forced organizations to not only legitimize their businesses for regulatory bodies but also to show commitment towards environment for satisfying considerate customers. Customers possess the ability to disown the services and products of any company (Chang & Chen, 2013). Oftentimes, an organization's claims of being an eco-friendly enterprise are not in accord with their organizational activities, which is adequately explained by Pillai and Patel (2012) that the term "greenwashing" is used in circumstances whereby companies assert that a product is eco-friendly while it fails to yield the expected eco-protective performance. Nyilasy et al. (2014) further elaborate that a difference in the claimed and actual performance of eco-friendly products has created hesitation among consumers, affecting their buying behavior.

When it comes to exhibiting and supporting pro-environmental concerns, organization members are more willing to control their enterprise's damaging aspects on the environment when they possess increased awareness of ongoing environmental problems (Gadenne et al., 2009). Zilahy (2003) states that amongst all other important aspects, one condition is very significant in identifying the capacity of an organization to take part in pro-environmental activities, i.e. employees have an environmental commitment in them. Therefore, Perron et al. (2006) suggest that it is nearly impossible to solve any eco-issue

or implement any environmental plan when employees are not willing to exhibit commitment towards the environment. Moreover, according to Song, Ren and Yu (2019), green organizational identity also get affected by corporate social responsibility through new green product success. Thus, it is proposed that GI positively affects EC and the following hypothesis is recommended:

> **H₂:** Organizations with green identity are more committed to the environment.

2.3 Green Innovation Performance towards Competitive Advantage

Innovation in the manufacturing sector mainly concerns the improvement of organizational processes, involving traditional procedures for cost reduction that may in turn help many organizations in gaining success (Bessant & Tidd, 2007). Chen (2008) defined green innovation in terms of newness and improvements that are focused and ensured in organizational processes and activities. In the previous studies, green innovation has been mostly used as a dependent variable. There is more work to be done for further clarification of its role in the theoretical framework (Morant et al., 2017). Many organizations adopted new concepts and strategies involving the incorporation of innovation in their respective industries. Similarly, green innovation embodies improvements in manufacturing processes, i.e. the use of fewer resources, Environmental Management System (EMS) certifications, and pollution aversion (Eiadat et al., 2008).

Taylor et al. (2013) explained that many companies became successful after transforming their conventional ways of doing businesses to green systems and practices. The World Business Council for Sustainable Development (WBCSD) report asserts that environmental management requires firms and organizations to carefully and proactively use natural resources in production processes (WBCSD, 1996). Researchers have argued that sometimes it is hard to use less energy in the manufacturing stages and that relying only on strategies without innovative technology will not lead to sustainability. But its usage can be controlled by incorporating energy efficient technologies and changes in behavior, which deliberately results in less energy consumption (Figge & Hahn, 2012). Saxena and Khandelwal (2012) made it clear that being green brings revenue to the organization involving those practices of 'green product' and green technology that can aid in conserving the environment. Kearins et al. (2010) investigated that few organizational management teams decided to lessen their organization's impact on the environment by focusing on downsizing instead of development.

As argued by Chen et al. (2006) a positive relationship exists between green innovation and competitiveness which entices an organization towards the integration of green innovation in management and business handling, resultantly helping enterprises in becoming market leaders and gaining a competitive edge over competitors. Gürlek and Tuna (2018) concluded that in order to experience competitive advantage, organizations need to spend on, and contribute more to, those tasks which strengthen green innovation. Porter and Van der Linde (1995) assert in the same way that green innovation has the capability to increase the worth of any product and process, resultantly decreasing the costs being invested in preserving the environment. This effortlessly enhances the image of an environmental corporation. Green innovation is that construct which not only attracts entities outside but within an organization. Customers, suppliers, retailers,

marketers, employees, organizational management and other stakeholders perceive innovation substantial for improvement, possessing the capability of impacting commitment towards the environment. Such stakeholder's perception of organizational commitment and innovative performance about environmental sustainability grants organizations an identifiable image and position (Chen et al., 2006).

Moreover, organizations tend to behave environment friendly due to the various pressures. Many scholars are currently using institutional theory at organizational level in order to explain environmental protection procedures (Moon et al., 2014; Albertini, 2017). According to these researchers, institutional pressures influence the mindset of organizations towards environment. However, there are mixed findings regarding institutional pressures on environment protection. Few studies concluded that institutional pressure plays key role in making organizations think towards environment protection with positive significant results (Roxas & Coetzer, 2012; Colwell & Joshi, 2013) and others highlight the insignificant finding as far as environment protection is concerned (Nygaard & Biong, 2010). Hence, it can be concluded that organizations play different role if provided with same institutional pressures. This basically raises the need of identifying the mediator between green organizational identity and green innovative performance i.e. environmental commitment as explored in this study. Furthermore, Resource-Based View argues that organizations need to have sufficient resources to respond to anomalies or complexities. Hence, institutional pressures can be taken as anomalies and treated as external factor whereas environmental commitment can be considered as internal factor to respond to these complexities in shape of institutional pressures as top-tier management commits to respond to these institutional pressures (Wang et al., 2018).

Peattie (1992) explained that organizations can gain a competitive edge by incorporating green innovation into their products while designing, packaging and labeling their products. Environmental commitment and green innovation are related to each other because any effort and improvement made to one aspect results in the improvement of another (Keogh & Polonsky, 1998).

Thus, it is argued from the literature review that EC positively affects GIP. Moreover, EC also mediates the relationship between GI and GIP and the following hypothesis are proposed:

- ➢ **H₃:** Organizations with a commitment towards environment innovate more in terms of green performance.
- ➢ **H₄:** Environmental commitment mediates the relationship between green organizational identity and green innovation performance.
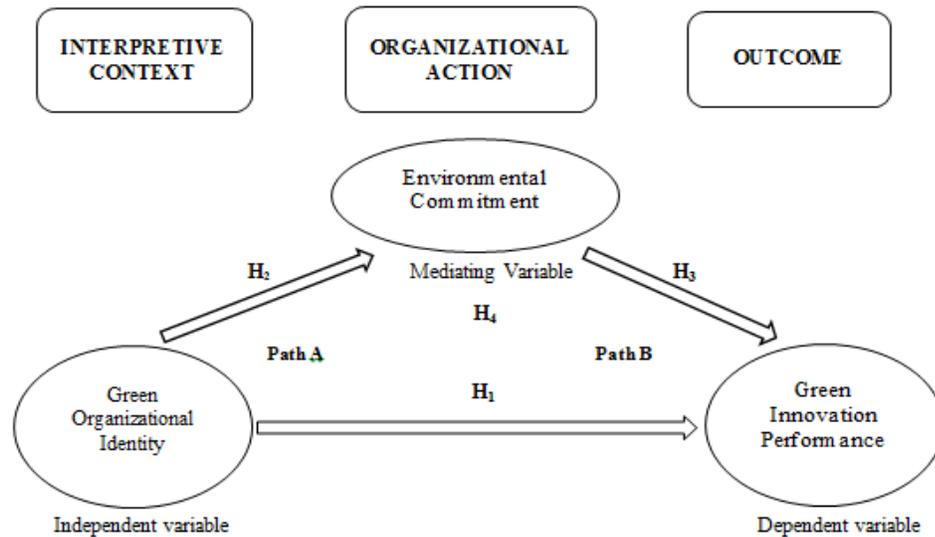
2.4 Conceptual Framework Model

Figure 1:   Conceptual Model of Research (Source: Chang and Chen, 2013)

With reference to Figure 1, researchers have adapted the model used by Chang and Chen in 2013 in order to meet the objectives of the study and have used "interpretive context-organizational action-outcome" scheme in accordance with GI to identify the impact of GI on GIP by considering the mediating role of "environmental commitment" by using "organizational identity theory" (Soewarno et al., 2019). As per this theory, researchers have used GI as part of "interpretive context" and the independent variable that will affect EC as part of organizational action which is mediator in the current study and will lead to the outcome i.e. GIP, also used as dependent variable in the study. GI relation with GIP has been examined separately and along with EC as a mediator. Moreover, institutional theory is used to explain the institutional pressures explained through organizational commitment (Wang et al., 2018) and organization identity.

3. Methodology and Measurement

3.1 Instrument Development

This quantitative study is based on the work of Chang and Chen (2013). Three constructs have been adopted from their study. The questionnaire was designed by modifying and changing slightly the original questionnaire to address and measure the extent of organizational concerns on protecting and improving environmental performance. For measuring the construct of Green organizational identity, the instrument developed by Chen (2011) has been used. Work of Henriques & Sadorsky (1999) has been referred to measure "environmental commitment". In the same way, the work of Chen et al. (2006) has been referred to measure "green innovation performance". The cross-sectional study design has been selected concerning data collection for the measurement of selected variables at one point in time. Green Organizational Identity is an independent variable in

this study, which is stable and remains unaffected by the other variables being measured. Green Innovation Performance is a variable which is dependent on the others being measured. Similarly, Environmental Commitment is a mediating variable in the conceptual framework model.

3.2 Face Validity

As the questionnaire was adopted from a previous study, so it was important to check the face value of an instrument in the context of Pakistan. The survey was distributed through E-mail to 3 university professors. Face validity resulted in the deletion of fourteen questions. Questions were deleted on the basis of their lack of clarity and technical expressions which were hard to understand by work-level employees.

3.3 Sample Selection and Data Collection

For this study, only those manufacturing industries were considered who had enlisted themselves to the initiative of Green Office (GO) with worldwide fund-Pakistan (WWF-Pak). Out of forty-three Green-office certified organizations (mentioned on the website of wwfpak.org), seven organizations were randomly selected for data collection purposes on the basis of Lahore-based locality, whereas, convenient sampling has been used to select employees within the randomly selected organizations. The reason for opting convenience sampling was based on the importance of the location and researchers' constraints as Lahore is not just the second largest city of Pakistan but researchers were also Lahore based and had time, cost and logistics constraints. Samples for this study included employees from top management and middle management only.

A pilot study was performed in which 20 questionnaires were distributed to thirteen managerial employees of manufacturing firms to establish the scale validation. After successful completion of the pilot study, questionnaires were distributed to the whole sample by researchers through a self-administered questionnaire (SAQ) method to prevent any intervention. Twenty-one employees were approached from each of the seven organizations and data of 150 respondents was collected over a three-week period. As a total of 150 (N=150) employees were approached, out of them, 110 (N=110) completed the questionnaires with a response rate of 73.33%. Out of 110 responses, 10 were deleted because of incomplete responses. 60.9% respondents were Male and 39.1% were female. With reference to the designation of the respondents, 60.9% were managers and 39.1% Non-Managers. It needs to be taken care that often cited 10 times rule for sample size determination is not correct and Heir suggested the use of Cohen's sample size requirement table (heir *et al.*, 2013). Cohen's sample size table suggests the use of a minimum of 52 samples and a maximum of 110 samples at 0.1 and 0.2 R-square with 0.05 significance level to achieve the statistical power of 80%. Therefore, the use of 100 sample size in this study was valid for variance and effect assessment.

4. Data Analysis and Findings

After data collection, the input of data took place in SPSS software. Normality has been tested for the analysis of data distribution across the population. The normality test in Shapiro-Wilk provided with p- values of 0.001, 0.039 and 0.017 for GI, EC, and GIP respectively. It can be concluded from Shapiro-Wilk values that the data is non-normal because the above-mentioned values are less than Alpha (α=0.05).

As the data is concluded to be non-normal, non-parametric analysis is further applied to the data for hypotheses acceptance or rejection. Hence, structural equation modeling (partial least square) was more appropriate to use for further analysis. Because of the data characteristics of a small sample size, non-normal data were fulfilled (Hair *et al.*, 2013). The model under study is a Reflective-Measurement model, consequently PLS is also suitable for data analysis as this software is capable of handling both reflective and formative measurement models (Ringle *et al.*, 2015). So, hypotheses testing have been done with the help of Smart PLS version 3.2.6. When all paths had been allocated and every construct is assigned to its particular indicators, this model is complete to be used for further measurement and structural analysis.

4.1 Measurement Model

In order to validate the reliability of the measurement model, the significance levels of the loading factors, composite reliability, average variance extracted (AVE) and square root of AVE is calculated for each of construct through PLS algorithm. Validating the measurement model is a recommended step before determining structural analysis of the model (Anderson & Gerbing, 1988). Peter and Churchill (1986) explained that any association between latent variables can only be realized when formation of construct validity is displayed.
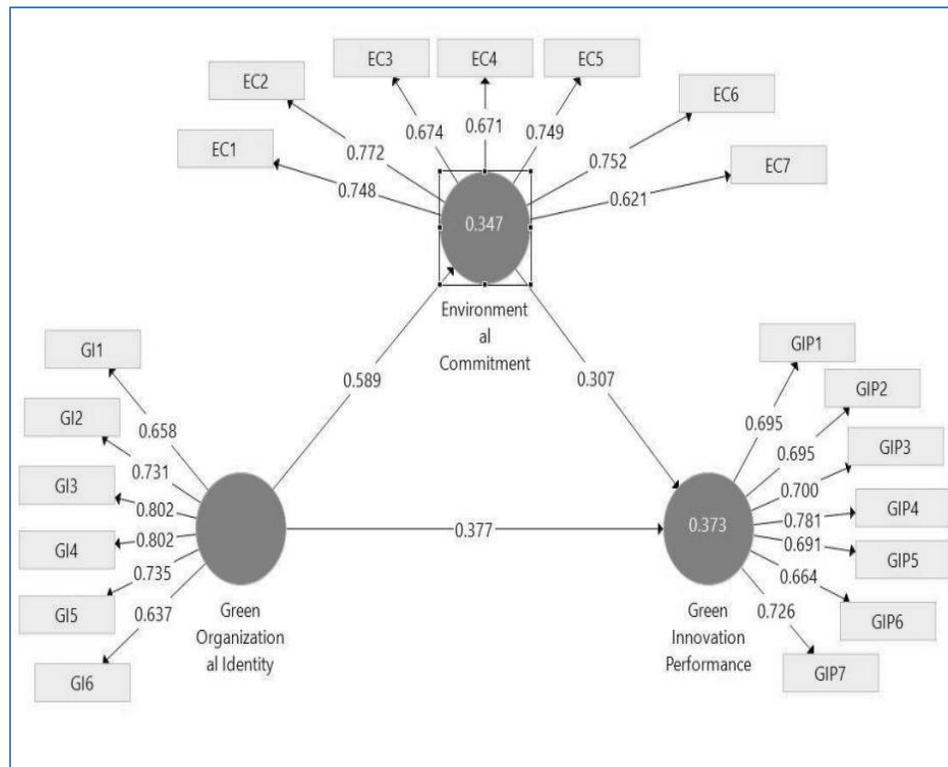

Figure 2: Measurement Model

4.1.1 Green Organizational Identity

The construct "Green Organizational Identity" (GOI) is calculated with six items using a five-point Likert scale from strongly agree to strongly disagree items ranging from GI1 to GI6. Loading factors (mentioned in Figure 2 and Table 1) for each item in GOI were significant, as these values exceeded the suggested value of "0.6" (Chin, 1998). The value of composite reliability 0.872 is significant and reliable as it had surpassed the suggested and recommended value of 0.7 (Hair et al., 2013). The value of AVE 0.533, extracted from composite reliability, is also valid as it had reached the suggested value of 0.5 (Hair et al., 2006). Cronbach's alpha is significant at 0.823 that shows the reliability of questions. The calculated square root of the AVE is 0.730 which is determined from the provided value of AVE.

4.1.2 Environmental Commitment

Environmental commitment is measured with seven items using a five-point Likert scale ranging from 'strongly agree' to 'strongly disagree'. The factor loading values (mentioned in table 1) of environmental commitment were significant, as each item's loading factor had reached and exceeded the accepted value of 0.6 (Chin, 1998). Computed composite reliability value of 0.879 exceeded the acceptable value of 0.7 (Hair et al., 2006). Similarly, calculated values of Cronbach's Alpha, AVE and Square root of AVE were 0.840, 0.511 and 0.7148 respectively.

4.1.3 Green Innovation Performance

Green innovation performance has been evaluated with seven items using a five-point Likert scale. Loading factor (mentioned in Table 1) of each item in the construct is significant and valid (Chin, 1998). Computed Cronbach's Alpha and Composite reliability were 0.834 and 0.875 respectively which is more than the threshold value of 0.70 (Hair et al., 2006). Similarly, AVE were calculated with the value of 0.501 where threshold value should be more than 0.50 (Hair et al., 2006) along with square root of AVE was calculated to be 0.707.

Table 1: Construct Validity

Variables	Items	Loading factor
Green organizational Identity Cronbach's Alpha = 0.823 Composite Reliability = 0.872 AVE = 0.533 √AVE = 0.730	GI 1	0.658
	GI 2	0.731
	GI 3	0.802
	GI 4	0.802
	GI 5	0.735
	GI 6	0.637
Environmental Commitment Cronbach's Alpha = 0.840 Composite Reliability = 0.879 AVE = 0.511 √AVE = 0.7148	EC 1	0.748
	EC 2	0.772
	EC 3	0.674
	EC 4	0.671
	EC 5	0.749
	EC 6	0.752
	EC 7	0.621
Green Innovation Performance Cronbach's Alpha = 0.834 Composite Reliability = 0.875 AVE = 0.501 √AVE = 0.707	GIP 1	0.695
	GIP 2	0.695
	GIP 3	0.700
	GIP 4	0.781
	GIP 5	0.691
	GIP 6	0.664
	GIP 7	0.726

4.1.4 Discriminant validity

After the evaluation of construct validity, discriminant validity was checked based on the criteria of Fornell-Larcker (1981). Discriminant validity explains that all of the construct items are distinct (Hair et al., 2013). Fornell-Larcker (1981) states that discriminant validity is acceptable when values determined from the square root of AVE exceed the rest of its co-relational values. Table 2 depicts that √AVE values are greater than rest of the values in the described table. Similarly, in table 3 each construct's cross loading values are greater than the remainder of its corresponding variables, which supports and verifies the presence of discriminant validity across latent variables both in the values of table 2 and 3.

Table 2: Discriminant Validity

	Environmental Commitment	Green Innovation Performance	Green Organizational Identity
Environmental Commitment	**0.715**		
Green Innovation Performance	0.529	**0.708**	
Green Organizational Identity	0.589	0.558	**0.730**

Note: Bold values are larger in a given row

Table 3: Cross Loadings

	Environmental Commitment	Green Innovation Performance	Green Organizational Identity
EC1	**0.748**	0.271	0.513
EC2	**0.772**	0.493	0.544
EC3	**0.674**	0.356	0.299
EC4	**0.671**	0.343	0.450
EC5	**0.749**	0.285	0.386
EC6	**0.752**	0.443	0.367
EC7	**0.621**	0.412	0.325
GI1	0.368	0.476	**0.658**
GI2	0.308	0.358	**0.731**
GI3	0.517	0.393	**0.802**
GI4	0.415	0.416	**0.802**
GI5	0.605	0.359	**0.735**
GI6	0.293	0.445	**0.637**
GIP1	0.308	**0.695**	0.369
GIP2	0.344	**0.695**	0.359
GIP3	0.326	**0.700**	0.482
GIP4	0.406	**0.781**	0.466
GIP5	0.436	**0.691**	0.355
GIP6	0.365	**0.664**	0.354
GIP7	0.430	**0.726**	0.362

Note: bold value is a larger value in a given row

4.1.5 Heterotrait Monotrait Ratio

Heterotrait Monotrait (HTMT) ratio is another technique for assessing discriminant validity, which identifies that discriminant validity is acceptable if HTMT ratios are smaller than 0.90 (Henseler et al., 2015: Teo et al., 2008: Gold et al., 2001). Henseler et al. (2015) argue that if the values of HTMT exceed margin value it shows that the measurement model has inadequate discriminant validity. Table 4 depicts that all of the HTMT values i.e. 0.621, 0.676 and 0.672, are less than threshold value of 0.9, which implies that lower HTMT ratios leads to increased discriminant validity.

Table 4: HTMT

	Environmental Commitment	Green Innovation Performance	Green Organizational Identity
Environmental Commitment	-		
Green Innovation Performance	0.621	-	
Green Organizational Identity	0.676	0.672	-

4.2 Analysis of Structural Model

Empirical analysis demonstrates that the relationship among latent constructs is the structural model. After checking the validity of the relationships between latent constructs

and their respective items in measurement model, the significance of path coefficient and the strength of the relationship between constructs was assessed.

The PLS Structural model evaluation constitutes of five different tests including Path coefficient determination for hypothesis testing, analyzing R-Square, determining effect size, predictive relevance and Goodness of fit. Bootstrapping with 500 subsamples and 0.05 significance level has been carried out for the calculation of path coefficient. The significance of each hypothesis is tested through Path Coefficient. Table 5 demonstrates that original path coefficient values for all paths are significant and greater than 0.1, T-values are larger than 1.96, and P-values of all paths are less than 0.05 (Hair *et al*., 2013). Hence, from statistical results path coefficient is significant, therefore an alternative hypothesis for each construct is accepted.

Value of R-Square was determined through PLS-Algorithm. The accepted value of R^2 must be greater than 0.10 for the acceptance of model's predictive relevance (Falk & Miller, 1992). Figure 2 indicates that Green organizational identity predicts 34.7% of Environmental commitment ($R^2 = 0.347$) and 37.3% of green innovation performance ($R^2 = 0.373$).

Observed R^2 values for latent constructs of environmental commitment and green innovation performance are empirically significant and larger than the accepted threshold of R^2, which concludes R^2 to be significant and valid for model fitness measurements. In table 5, VIF for paths GI→GIP, GI→EC, and EC→GIP is yielding values within acceptable threshold range of VIF < 5 (Ringle *et al*., 2015), indicating a significant co-relation exists among latent constructs.

According to Cohen (1988), effect sizes of 0.02, 0.15, and 0.35 are recommended as small, medium and large effects. This in turn means that any F-Square value greater than 0.15 is considered as moderate effect, any variable possessing F-square value less than 0.1 is determined to be having a small effect and a value of F- square greater than 0.35 is considered as a large effect. The effect size of environmental commitment on green innovation performance is 0.098 and possessed P-value of 0.000 which implies that it has a small but statistically significant effect. The effect size of Green Organizational Identity on Environmental Commitment is 0.533 with P-value 0.000, which concludes that it has a healthy and empirically significant effect. In the same way, the effect size of green organizational identity on green innovation performance is 0.148 with P-value 0.001, which has a small but statistically significant effect (Hair et al., 2013).

Alongside R^2, sample reuse technique Q^2 was used for the assessment regarding predictive relevance of path model. Fornell and Cha (1993) suggested that a value of Q^2 higher than 0 indicate that a model possesses predictive relevance while, if value of Q^2 for a particular construct is less than 0 then that model is lacking in predictive relevance. Table 5 identifies that Q^2 values for EC and GIP are 0.158 and 0.163 respectively. Statistically, these values are greater than 0 identifying that the PLS path model possesses predictive relevance for both endogenous constructs Environmental commitment & Green innovation performance (Hair et al., 2017).

Table 5: Structural Analysis of Model

Hypothesis	Paths	Original Value	T-Value	P-Value	Results	F-Square	R-Square		Q-Square
H$_1$	GI→GIP	0.307	3.316	0.001*	Supported	0.148	EC	0.347	0.158
H$_2$	GI→EC	0.589	8.439	0.000*	Supported	0.533	GIP	0.373	0.163
H$_3$	EC→GIP	0.377	3.851	0.000*	Supported	0.098			

*P<0.05

4.2.1 Goodness of Fit (GoF)

Henseler and Sarstedt (2013) contradicted on the usage of GoF index in PLS SEM. Their argument against employing this method was that it fails to validate the measurement model. Tenenhaus et al. (2005) provided a concept of GoF Index which involves a square root of value obtained from multiplying average scores of AVE into average score of R-square. Wetzels et al. (2009) allocated GoF guide for assessing the extent of model fitness i.e. "GoF$_{small}$ = 0.1, GoF$_{medium}$ =0.25, GoF$_{large}$= 0.36". The aforementioned values are the acceptable criteria for conformance of PLS model validity globally. In table 6, GoF formula i.e. (GoF= $\sqrt{AVE * R^2}$) yielded a GoF value of 0.430, which is higher than GoF$_{large}$= 0.36. This statistically means that the model fits well compared to the GoF values mentioned above.

Table 6: GOF Index

Variables	AVE	R-SQUARE
Green Organizational Identity	0.533	
Environmental Commitment	0.511	0.347
Green Innovation Performance	0.501	0.373
Average Scores	0.515	0.36
AVE * R^2	0.185	
(GoF= $\sqrt{AVE * R^2}$)	0.430	

4.3 Mediation

Hair et al. (2013) recommended compliance with the instructions of Preacher and Hayes (2004, 2008) for mediation analysis and model bootstrapping for determining indirect effects. Preacher and Hayes (2008) confirmed the mediation procedure to be followed by providing two rules i.e. bootstrapped confidence interval and bootstrapping the indirect effect which states P-value must be less than 0.05 in such a way that the relationship between IV and DV through mediator must be significant. In order to ascertain the mediating effects of environmental commitment on IV and DV, bootstrapping with 500 subsamples was performed. Table 7 describes bootstrapping procedure in which indirect effect β=0.181 (0.589 * 0.307) is significant with T value of 7.189. According to Preacher and Hayes (2008) indirect effect 0.181 with bootstrapped confidence interval at 95% (LL=0.375, UL=0.684) does not possess a zero in between the values. This concludes that mediation between independent and dependent variables exists. Hence, a mediation analysis is empirically significant.

Table 7: Mediation Analysis

Path A (IV-Med)	Path B (Med-DV)	Indirect Effect	Standard Error	T-Value	Bootstrapped confidence Interval	
					95% LL	95% UL
0.589	0.307	0.181	0.078	7.189	0.375	0.684

Table 8: Indirect Relationship between Green Organizational Identity and Green Innovation Performance

	Original Value	T-Value	P-Value
EC →GIP	0.307	3.051	0.001
GI →EC	0.589	8.335	0.000
GI→ GIP	0.377	3.696	0.000

In order to identify the type of mediation between variables, significance of an indirect effect was determined before a direct effect (Hair et al., 2017). Therefore, for analyzing an indirect relationship between GI and GIP, PLS bootstrapping was performed, which showed that the relationship between IV, DV and mediator were significant with P-values lower than 0.05. Table 8 identifies that the relationship between IV, DV and mediator are significant.

Table 9: Direct Relationship between Green Organizational Identity and Green Innovation Performance

	Original Value	T-Value	P-Value
GI →GIP	0.573	8.335	0.000

Table 9 describes a direct relationship between Green organizational identity and green innovation performance which implies a significant relationship with T value 8.335 and P value 0.000.

Since all of the paths possess a significant relationship between them, it is concluded that hypothesis number 4 regarding H_0 is rejected, which means that there is a complementary partial mediation between variables. Institutional theory and resource-based view also support the aforementioned findings regarding existence of mediation as environmental commitment being internal factor of resource based view plays key role in handling the environmental pressures (Wang et al., 2018) and mediates the relationship between organizational identity and green innovation performance. Moreover, literature also supports this relationship regarding mediation (Chen et al., 2006; Chang & Chen, 2013). This finding is useful in the context of developing country like Pakistan where focusing more on environmental commitment in order to deal with institutional pressures can bring better innovative performance in context of green organizational identity.

5. Conclusion

Apart from the fact that this study empirically sheds light on the significance of incorporating green and eco-sustainable operational activities in industries, this study will also be beneficial for policymakers, manufacturers, retailers, marketers, and customers to comprehend how industrial activities impact the environment.

A framework including "interpretive context – organizational action – outcome" has been developed for optimally understanding the impact of green organizational identity on green innovation performance. This research study provided results for conclusion that there is a positive direct relationship between green organizational identity and green innovation performance before the inclusion of a mediator in the IV and DV model. The empirical evaluation provided the value of 0.573, stating that a significant co-relation between IV and DV exists. It is being accepted that green organizational identity impacts environmental commitment in a positive way with value to be 0.589 empirically which clearly indicates that the relation between construct is strong and accepted. This means that if an organization intends to improve their identity they need to work additionally on their commitment towards the environment. An increase in eco-commitment increases the loyalty of customers and the positive perception of the organization, which will, in turn, improve the image and organizational member's motivation of being associated with an eco-committed organization. The relationship between environmental commitment and green innovation performance appeared to be significant, tested by factual evaluation which provided the value of 0.307, exhibiting a good relationship between environmental commitment and green innovation performance. It concludes that an organization that is eco-committed and strives for innovation towards green practices has a tendency to make gains in the market and maintain a competitive edge. Green innovation performance has entitled organizations to experience the benefits of first-mover advantages through the introduction of those practices in the market ahead of their competitors. Mediation analysis applied to the framework concluded that these organizations, in order to obtain improved innovation performance, tend to work on the improvement of green organizational identity and environmental commitment as well.

5.1. Theoretical Contribution

It is concluded that all hypotheses developed in this study have been supported. Theories such as institutional theory and organizational identity theory have provided the empirical support in the developing country like Pakistan, although it seems that developing countries are not giving green practices due consideration, however, this is not the case as shown in case of Pakistan. Results in favor of green organizational identity and green innovative performance with environmental commitment as mediator confirm the support of organizational identity theory and institutional theory. This theory further supports the previous studies of Chang and Chen (2013), Song and Yu (2017), Wang et al. (2018), and Xing et al. (2019).

5.2. Practical Contribution

There have been number of climate change conferences and initiatives around the world for looking at the environment degradation issues. According to the climate change conference held in Poland in 2018, the agenda was to stop and minimize the carbon emissions by 2020. This might not be possible without taking into account the role of

both local and multinational organizations across the globe and in developing countries like Pakistan. Manufacturing organizations need to develop the organizational identity procedures in order to increase the environmental innovative performance in the form of reducing "greenhouse gases" as output. Pakistan also needs to develop this model at organizational level to increase the effects at societal level.

6. Recommendations

The following recommendations could help researchers, manufacturers, policy makers and regulatory bodies in understanding the benefits of being environment focused with reference to this study:

➢ Create the capacity for creativity and innovation by management, through constructive leadership support and feedback with employees. This will unite organization members towards a coherent identity for the achievement of goals.

➢ Create a comprehensive Zero Waste Action Plan. This strategy needs to state that products should be designed with built-in tendencies to be reused, rebuilt, and recycled by the user. Developing such factor in the design of any product reduces the chances of releasing harmful waste in the ecosystem.

6.1 Limitation and Future Scope

This research study has been conducted in the manufacturing industry. Future research can be conducted in other industries. Moreover, a quantitative approach has been used for data collection purposes. Other methods can be used for future research, including qualitative or mix-method techniques in order to explore the reasons for non-implementation of green ideology in industries that are yet to work on this idea. In this study, environmental commitment is the only mediator used. For further work, other variables such as leadership, culture and employee commitment can be used for the detailed understanding of their organizational impacts, to help managers, policy makers and other stakeholders to understand what particular variable should be focused on for the achievement of business and environmental sustainability.

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