

INNOVATE TO ELIVATE: UNVEILING THE MEDIATING ROLE OF GREEN INNOVATION BETWEEN CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL PERFORMANCE: A STUDY OF KHYBER PAKHTUNKHWA MANUFACTURING INDUSTRIES

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ABSTRACT

Objectives: The main objective of the study was to investigate the strategies used to improve "organisational environmental performance" (EP). The research addresses the significant role of corporate social responsibility CSR in relation to the environmental performance of organizations. It operates systematically gathering and analyzing existing literature using the legitimacy theory.

Method: The present research investigates the association between CSR and EP. Green innovation GI as mediator in the study was explored. 250 participants from manufacturing industries were selected for the data collection.

Results: The study's findings revealed that CSR has positive and significant effect on environmental performance. Furthermore, green innovation partially mediates the stated relationship.

Implications: The study's findings align with the suggested mediation framework. In the developing country, the CSR practices is a novel concept, and more study is required to identify issues related to sustainability and evaluate the effects of CSR practices in manufacturing sectors.

Keywords: CSR, green innovation, environmental performance, manufacturing industries employees

INTRODUCTION

Air pollution, water contamination, rash utilization of resources, and the use of hazardous substances are just a few of the negative impacts of human activities that have been recently brought to light due to the advent of climate change and its worldwide consequences (Zheng et al., 2021; Cheng et al., 2022). It is now important for organizations to emphasize environmental and nature preservation efforts because 2022 was deemed the warmest year ever because of the mentioned environmental challenges (Siddik & Tian, 2022; Kraus et al., 2020; Zheng et al., 2021). Understanding how financial institutions could grow even more environmentally friendly is, therefore, the issue

of the highest priority. While problems about economic growth, environmental preservation, and social cohesion are not novel, the importance of combining these aspects into a single study is growing constantly (Hernández et al., 2020). Furthermore, corporate social responsibility (CSR) plays an essential role in doing business in a more sustainable manner that considers economic, social, and environmental factors simultaneously (Kraus et al., 2020).

On the other hand, green finance (GF) is a relatively new but powerful tool in the financial world that marries social and environmental progress with tangible financial and business benefits (Manzoor et al., 2024; Siddik & Tian,

2022; Hernández et al., 2020). Whether it's about sustainability performance (Chen et al., 2006), environmental performance (Kraus, Rehman, & García, 2020), or company performance (Yuan & Cao, 2022), green innovation (GI) is a significant factor. The effectiveness of an organization's environmental initiatives and products can be gauged by its environmental performance (EP) (Fernando et al., 2029), a crucial component of environmental sustainability. Therefore, it's safe to say that CSR and GI, when combined, ensure the survival of enterprises and the continued financial growth of nations. This study delves into how CSR and GI influence the EP of developing manufacturing industries. The research draws on data from Khyber Pakhtunkhwa to construct and test a conceptual model that analyzes the relationships between the study variables.

Climate change is a pressing issue for developing nations like Pakistan (Siddik & Zheng, 2021). CSR and GI, when combined, ensure the sustainability and long-term economic growth of companies. They incorporate eco-friendly technology and corporate social responsibility to address these issues and foster long-term growth (Oguntuase & Windapo, 2021; Guang-Wen & Siddik, 2022). This study reveals that while CSR and innovation are more commonly adopted in advanced nations, Pakistan, as an emerging economy, should also prioritize these strategies. Therefore, this study investigates the drivers of EP in the manufacturing industries of a developing country. Previous studies have explored how CSR influences corporate, environmental, and sustainability performance (Siddik & Zheng, 2021; Abbas, 2020). However, few studies have examined the impact of CSR on EP (Kraus, Rehman, & García, 2020) in financial organizations, and the findings have been inconsistent (Siddik & Zheng, 2021; Guang-Wen & Siddik, 2022). The literature also indicates that GF affects sustainability, EP, and financial performance (Siddik & Zheng, 2021; Cheng et al., 2022; Zheng et al., 2022).

By providing theories based on actual information on CSR, GI, and EP in the manufacturing industries of a developing country, this study assists professionals, researchers, and lawmakers. The present study advances a legitimacy-based method of study for

CSR, GI, and EP. Previous studies employed stakeholder, natural RBV, ability motivation-opportunity, and contingency theories for CSR, GI, and EP in major industrial businesses and SMEs. Stakeholder theory was used to study how CSR affects SME economic performance (Hernández et al., 2020). Rehman et al. (2021) used contingency theory to examine environmental strategy and management effectiveness. Singh et al. (2020) investigated the association between GI and EP of SMEs using the ability motivation-opportunity theory. In contrast, Kraus et al. (2020) used the natural RBV theory to analyze the relationship between CSR, GI, environmental strategy, and EP of major industrial companies. This study used the theory of legitimacy to analyze the relationship between CSR, GI, and EP in the manufacturing sector. Managers may now enhance manufacturing sector EP with CSR and GI.

Literature Review

The legitimacy theory argues that the society's permission is necessary to a firm's survival. According to the theory of legitimacy, firms aim to achieve and sustain legitimacy by integrating their goals, activities, and strategies with community values for environmental sustainability (Boersma, 2022). Therefore, firms should prioritize activities aligned with society values and regulations. According to the legitimacy theory, CSR refers to actions that improve organisational performance, sustainability, and benefit society and the environment (Guang-Wen & Siddik, 2022). Corporate social responsibility programs seek to ensure ethical, socially responsible, and community-beneficial company practices (Manzoor et al., 2023; Mocan et al., 2015). Furthermore, GI refers to an organization's creative activities, such as green banking, online banking, remote deposit, and paper reduction, which seek to enhance environmental sustainability (Kraus, Rehman, & García, 2020). Therefore, firms need to prioritize CSR activities (e.g., social, economic, and environmental) and GI projects to maintain or recover legitimacy and achieve environmental sustainability. This study used legitimacy theory to investigate the link between CSR, GI, and EP in the manufacturing industries of a developing country.

Hypothesis development

Corporate social responsibility and environmental performance

Studies indicate that CSR has been associated with financial achievement, but few researches have investigated its impact on EP (Ma et al., 2023; Suganthi, 2020). Ahmad, Ullah, et al. (2021) found that CSR activities enhance EP and promote pro-environmental behaviour in Pakistani organizations, potentially reducing the impact on the environment. Sidhoum and Serra, (2017) showed a significant relationship between CSR and numerous performance measures in US power utilities, including economic, social, and environmental performance. Environmentally friendly technologies may boost economic results by promoting well-being and promoting a better environmental system. In this research, GI refers to technical improvements including green technology, internet banking, and customer service that help banks improve their environmental sustainability. Kraus et al. (2020) found that CSR positively affects GI and in turn mediates the relationship between CSR and EP. As a similar point of reference, Al-Shuaibi, (2016) stated that corporate social responsibility (CSR) greatly boosts innovation, whilst Suganthi, (2020) found that CSR activities had a significantly positive influence on the adoption of environmentally friendly practices in India. According to the findings of the research, incorporating corporate social responsibility (CSR) activities within a company is a strategic move that may be taken to guarantee sustainable performance.

As a consequence of this, it is feasible to draw the conclusion that corporate social responsibility initiatives significantly enhance the GI and EP of an organization. The following hypotheses were proposed:

H1: There is positive relationship between CSR and environmental performance.

Mediating role of green innovation

The descriptions that have been provided in the past about the relationships between CSR, GI, and EP have revealed the fact that CSR has an effect on GI, which in turn leads to an improvement in an organization's Manager Performance. The idea that GI has a positive effect on EP has been shown by numerous works of literature (Kraus, Rehman, & García, 2020; Wang et al., 2021). In further research, findings have shown that corporate social responsibility (CSR) has an important influence on the performance of firms (Ahmad et al., 2022; Orazalin, N. (2020; Li, Esfahbodi, & Zhang, 2024). Recent research conducted by Kraus et al. (2020) has shown that environmental strategy and GI perform a key role in mediating the association between corporate social responsibility and environmental performance in Malaysian manufacturing companies. According to the findings from the research, the relationship between corporate social responsibility and organisational performance is not well understood and needs to be studied further by including a variable that acts as a mediator. An organization's competitive advantage may be described by environmental practices and GI, as stated by the natural RBV theory. This theory describes the relationship between ecological resources and their use. The GI is employed as a mediating variable in this research between the CSR and EP. As a consequence of this, the following hypotheses have been generated as a result of this study:

H2: Green innovation mediates the relationship between CSR and environmental performance.

Conceptual Framework

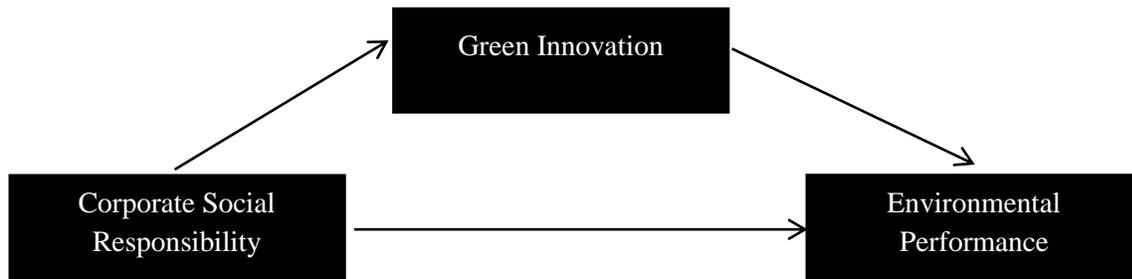


Figure1: Theoretical model

Methods and Materials

Population and Sampling

This survey involved employees from Pakistan's Khyber Pakhtunkhwa province's industrial sectors. Before the survey was distributed, the senior management of the industrial sectors granted their approval, enabling workers to participate in the research. In order to gather information for the survey conducted in the province of Khyber Pakhtunkhwa, an interactive meeting with managers was conducted to gather their experiences as human resource managers. HR managers were the survey's target demographic. After the questionnaire was given to the 300 respondents, a total of 250 valid responses were obtained. Data from all organizations was gathered at a predetermined day and time of visit using a standard questionnaire.

Instruments

A five-point Likert scale was used to measure all the variables in the present research.

Corporate Social Responsibility CSR

To investigate corporate social responsibility CSR consist of 4-items developed by Kraus, Rehman, García, (2020).

Environmental Performance EP

For measuring environmental performance, six items were taken from past study of Wang et al., (2021).

Green Innovation GI

5-items were adapted to evaluate an environmental performance (Kraus, Rehman, García, (2020); Khan et al., (2019).

Results

Table 1	Variables	items	Alpha values
Independent variables	Corporate social responsibility	04	.929
Dependent variable	Environmental Performance	06	.867
Mediating variable	Green Innovation	05	.942

Using the statistical tool SPSS, the alpha value was calculated to assess the reliability of the instruments. Cronbach's Alpha was used to examine the reliability, which shows how often items on a scale have a strong relationship with one another (Sekaran, 2003). Past research by Sekaran indicates that items with a Cronbach's alpha score of .7 or above are deemed reliable and

should be retained in the study. The model (table1) above shows that the scale items' alpha values are above .7, confirming the items' reliability and retention.

KMO and BTS tests

Table 2

Variables	KMO	BTS	df	P
CSR	.868	544.210	15	.000
GI	.791	254.390	06	.000
EP	.750	174.090	06	.000

In light of the findings presented above, the sample size is sufficient, taking into account the fact that the KMO values of the variables under investigation are more than .5. In an instance that

supports this; the BTS values of the variables in the research are significant, which indicates that the alternative hypothesis is supported. (Table 2)

Hypothesis Testing

Model summary

Table 3	R	R ²	S.e
Corporate social responsibility	.852	.725	.590

Regression analysis is explained in then Table 3 above. Based on of R² of CSR, represent 72% of

the variation in environmental performance, respectively.

Table 4

Coefficient summary

Variables	Und. beta	stand	t	Stand beta	ANNOVA	P	Decision
GPA	.822		24.292	.852	F (590.081) P < .5	.000	Supported H1
Dependent variable: Environmental performance							

Based on the finding of the regression study, the Corporate social responsibility (CSR) has significantly and positively relationship with the outcome variable EP. High beta values for CSR suggest that it contribute more explaining

variance in the EP. Therefore, a strong value of F and a substantial value of p reflect the overall model fitness. Hence, the three study hypotheses (H1 are accepted). (Table 4)

Mediation Analysis				Result
Table 5	Green HRM practices as predictor			Partial Mediation
CSR → GI	b (.6178)	T = (15.5199)	P = (.000)	
GI → EP	b (.5361)	T = (6.9001)	P = (.000)	
Total effect	.6258			
Direct effect	.2946			
Indirect effect	.3312			
Sable test	6.30484514			

A representation of the mediation analysis for the possible mediator (GI), corporate social responsibility and environmental performance can be seen in the table 5 that is situated above. A positive and strong mediating impact can be generated by that relationship. This study reveals that green innovation (GI) acts as a mediator, partially mediating the relationship between corporate social responsibility and environmental performance. Furthermore, the hypothesis is supported by substantial and statistically significant z and p values. Therefore, this result shows evidence in support of H2.

Results

This study investigated the relationship between CSR, GI, and EP in growing manufacturing sectors, KP. The study found an important positive association between CSR and EP. This research found that CSR has positive and significant relationship with EP. Furthermore, green innovation mediates the relationship between CSR and EP.

The legitimacy theory explains why institution engage in CSR initiatives, as social pressure and regulatory standards motivate industries to promote social acceptance and environmental sustainability (Guang-Wen & Siddik, 2022; Indriastuti & Chariri, 2021). Hernández et al. (2020) found that CSR components (social, economic, and environmental) considerably improve the economic performance of SMEs in Spain. The results contradict the research Kraus, Rehman, & García, (2020) that found CSR did not impact the EP of manufacturing enterprises in Malaysia. The study found that CSR positively impacts EP, highlighting the need for managers and owners to adopt CSR activities based on previous studies. Last but not least, the findings revealed that the GI contributed an important part in mediating the relationship between CSR and EP. The findings of this research are in contrast with the findings of Kraus et al. (2020), who found that corporate social responsibility (CSR) did not have a direct influence on environmental performance (EP), but it did have an indirect influence on EP via the existence of a mediating factor such as green innovation. A further relationship may be made between the arguments and the legitimacy theory, which asserts that GI is responsible for justifying

the association between CSR and EP (Indriastuti, & Chariri, 2021). The study was carried out in order to investigate the relationship. In addition, the findings were able to establish that GI is a complete mediator and that it reduces the strength of the relationships between these factors. Because the GI is the most significant a component that impacts how effectively manufacturing industries take care of the environment, the relationship is now different. The next most important factors are corporate social responsibility. Therefore, it is appropriate to draw a conclusion that GI significantly improves the environmental performance of manufacturing industries by reducing carbon emissions and energy consumption, as well as by providing personnel with green training on what they can do to save energy and paper. Following that, some of the most significant theoretical and practical contributions are examined in further detail.

Theoretical and Practical Implications

Theoretical implications:

This research enhances the current body of knowledge by investigated how green innovation acts as a mediator between corporate social responsibility (CSR) and environmental performance in the manufacturing sectors of Khyber Pakhtunkhwa (KP), Pakistan. This study extends our knowledge of how corporate social responsibility (CSR) affects environmental performance by emphasizing the importance of green innovation as a mediator. The study's results provide fresh perspectives on the interplay between corporate social responsibility (CSR), environmentally-friendly innovation, and ecological performance, enhancing the theoretical foundation of sustainable development. This study fills a gap in the current literature by examining how green innovation influences the relationship between corporate social responsibility (CSR) and environmental performance. It provides an innovative perspective on the association between CSR and the effects on the environment. The theoretical model of the research may be extended to various sectors and situations, facilitating a more profound comprehension of the intricate relationships among CSR, innovation, and environmental sustainability.

Practical implications:

According to the findings of this research, which have significant consequences for the manufacturing sectors in KP, investing in environmentally friendly innovation has the potential to increase the advantageous impact that corporate social responsibility has on environmental performance. Using the findings of the research, managers and policymakers may build strategies that combine corporate social responsibility (CSR) with green innovation, which will ultimately lead to better environmentally friendly results. Reducing waste, saving energy, and encouraging sustainable practices are some of the examples of green innovation and corporate social responsibility projects that are highlighted by the study as being important for sectors to prioritise. Through the implementation of environmentally friendly innovations, manufacturing industries have the potential to lessen their impact on the environment, enhance their reputation, and make a contribution to a more sustainable future. Practical suggestions derived from the research have the potential to influence decision-making and drive good change within the industrial sector, which will eventually be to the advantage of society and the environment.

Future study and Limitations

Considering the data for this research originated from the manufacturing sectors in Khyber Pakhtunkhwa, it is important to generalize the findings to other organizations and industries to comprehend the impact of corporate social responsibility (CSR) on long-term environmental performance of organizations. Further research is required to explore the potential of CSR practices in facilitating the production of cleaner commodities and reducing environmental risks, since there is a lack of empirical studies in this domain. In order to enhance the existing study results and analyse the effective tactics, it is necessary to conduct thorough investigations of manufacturing industries and other sectors involved in product manufacture in underdeveloped nations. CSR practices are integrated to attain organisational sustainability, which is ultimately required for environmental sustainability.

REFERENCES

- Abbas, J. (2020). Impact of total quality management on corporate green performance through the mediating role of corporate social responsibility. *Journal of Cleaner Production*, 242, 118458.
- Ahmad, N., Ullah, Z., Arshad, M. Z., waqas Kamran, H., Scholz, M., & Han, H. (2021). Relationship between corporate social responsibility at the micro-level and environmental performance: The mediating role of employee pro-environmental behavior and the moderating role of gender. *Sustainable Production and Consumption*, 27, 1138-1148.
- Ahmad, S., Islam, M., Zada, M., Khattak, A., Ullah, R., Han, H., & Araya-Castillo, L. (2022). The influence of decision making on social inclusion of persons with disabilities: A case study of Khyber Pakhtunkhwa. *International Journal of Environmental Research and Public Health*, 19(2), 858.
- Al-Shuaibi, K. M. (2016). A structural equation model of CSR and performance: Mediation by innovation and productivity. *J. Mgmt. & Sustainability*, 6, 139.
- Boersma, M. (2022). Organizational legitimacy and legitimizing myths. In *Research Handbook on the Sociology of Organizations* (pp. 107-124). Edward Elgar Publishing.
- Chen, J., Siddik, A. B., Zheng, G. W., Masukujjaman, M., & Bekhzod, S. (2022). The effect of green banking practices on banks' environmental performance and green financing: An empirical study. *Energies*, 15(4), 1292.
- Dai, X., Siddik, A. B., & Tian, H. (2022). Corporate social responsibility, green finance and environmental performance: does green innovation matter?. *Sustainability*, 14(20), 13607.
- Fernando, Y., Jabbour, C. J. C., & Wah, W. X. (2019). Pursuing green growth in technology firms through the connections between environmental innovation and sustainable business performance: does service capability matter?. *Resources, conservation and recycling*, 141, 8-20.
- Guang-Wen, Z., & Siddik, A. B. (2022). Do corporate social responsibility practices and green finance dimensions determine environmental performance? An Empirical Study on Bangladeshi Banking Institutions. *Frontiers in Environmental Science*, 10, 890096.
- Hernández, J. P. S. I., Yañez-Araque, B., & Moreno-García, J. (2020). Moderating effect of firm

- size on the influence of corporate social responsibility in the economic performance of micro-, small-and medium-sized enterprises. *Technological Forecasting and Social Change*, 151, 119774.
- Indriastuti, M., & Chariri, A. (2021). The role of green investment and corporate social responsibility investment on sustainable performance. *Cogent Business & Management*, 8(1), 1960120.
- Khan, S. N., Hussain, R. I., Maqbool, M. Q., Ali, E. I. E., & Numan, M. (2019). The mediating role of innovation between corporate governance and organizational performance: Moderating role of innovative culture in Pakistan textile sector. *Cogent Business & Management*.
- Kraus, S., Rehman, S. U., & García, F. J. S. (2020). Corporate social responsibility and environmental performance: The mediating role of environmental strategy and green innovation. *Technological forecasting and social change*, 160, 120262.
- Li, X., Esfahbodi, A., & Zhang, Y. (2024). The Impact of Corporate Social Responsibility Implementation on Enterprises' Financial Performance—Evidence from Chinese Listed Companies. *Sustainability*, 16(5), 1848.
- Ma, X., Khattak, A., Ghani, B., & Huo, M. (2023). Perceived overqualification in higher education institutions: Enhancing employee innovative behavior via creative self-confidence and harmonious workplace climate. *Current Psychology*, 1-12.
- Manzoor, S. R., Ullah, A., Ullah, R., Khattak, A., Han, H., & Yoo, S. (2023). Micro CSR intervention towards employee behavioral and attitudinal outcomes: a parallel mediation model. *Humanities and Social Sciences Communications*, 10(1), 1-14.
- Manzoor, S. R., Ullah, R., Khattak, A., Ullah, M., & Han, H. (2024). Exploring tourist perceptions of artificial intelligence devices in the hotel industry: impact of industry 4.0. *Journal of Travel & Tourism Marketing*, 41(2), 272-291.
- Mocan, M., Rus, S., Draghici, A., Ivascu, L., & Turi, A. (2015). Impact of corporate social responsibility practices on the banking industry in Romania. *Procedia Economics and Finance*, 23, 712-716.
- Oguntuase, O. J., & Windapo, A. (2021). Green bonds and green buildings: New options for achieving sustainable development in Nigeria. *Housing and SDGs in Urban Africa*, 193-218.
- Orazalin, N. (2020). Do board sustainability committees contribute to corporate environmental and social performance? The mediating role of corporate social responsibility strategy. *Business Strategy and the Environment*, 29(1), 140-153.
- Rehman, S. U., Bhatti, A., Kraus, S., & Ferreira, J. J. (2021). The role of environmental management control systems for ecological sustainability and sustainable performance. *Management Decision*, 59(9), 2217-2237.
- Siddik, A. B., & Zheng, G. W. (2021). Green finance during the COVID-19 pandemic and beyond: implications for green economic recovery.
- Sidhoum, A. A., & Serra, T. (2017). Corporate social responsibility and dimensions of performance: An application to US electric utilities. *Utilities Policy*, 48, 1-11.
- Suganthi, L. (2020). Investigating the relationship between corporate social responsibility and market, cost and environmental performance for sustainable business. *South African Journal of Business Management*, 51(1), 1-13.
- Wang, H., Khan, M. A. S., Anwar, F., Shahzad, F., Adu, D., & Murad, M. (2021). Green innovation practices and its impacts on environmental and organizational performance. *Frontiers in Psychology*, 11, 553625.
- Yuan, B., & Cao, X. (2022). Do corporate social responsibility practices contribute to green innovation? The mediating role of green dynamic capability. *Technology in Society*, 68, 101868.
- Zheng, G. W., Siddik, A. B., Masukujjaman, M., Fatema, N., & Alam, S. S. (2021). Green finance development in Bangladesh: The role of private commercial banks (PCBs). *Sustainability*, 13(2), 795