MODELING GREEN ORGANIZATIONAL CAPITAL AND ENVIRONMENTAL PERFORMANCE: MEDIATING AND MODERATING THE ROLE OF GREEN KNOWLEDGE SHARING AND GHRM PRACTICES

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Abstract. In this era of global warming, there is a great deal of pressure on businesses to decrease industrial waste to manage a sustainable environment. Therefore, the purpose of this research is to investigate these problems by introducing green organizational capital in manufacturing firms to improve environmental performance. This research is quantitative in nature and data were collected from small and medium-sized firms in Pakistan. Various directors and managers from SMEs are respondents to this study. For this study, the sample size is 190 from the manufacturing sectors. For testing the hypotheses while using SPSS version 25. Hence direct results supported the literature but GHRM as a moderator did not support it in developing countries. This report includes regulators and managers with advice for paying attention to the environment's performance. As a result, the results supported both direct and indirect assumptions, with varied theoretical and managerial implications for management and policymakers in ensuring environmental performance contributing variables.

Keywords: green organizational capital, green knowledge sharing, GHRM practices, environmental performance.

JEL Classification: D12, J23, E01.

Introduction

Previous research on organizational sustainability and resource sustainability has focused on large businesses, while SMEs, (Fassin et al., 2011) which account for a disproportionate amount of economic action's environmental implications, have gotten very little consideration (Boiral et al., 2019). According to the report of Pakistan industrial production data (2022), the growth in the manufacturing sector has reached the highest level as compared to the history of the last few decades. In Pakistan, the manufacturing sector has emerged as a major contributing share of the GDP. Although the advent of the industrial revolution increased production processes all over the world employing massive efficiencies, it also had many unintended consequences, such as the vast consumption of energy, the depletion of resources, and industrial pollution increased (Bohdanowicz et al., 2001; Xing & Yan, 2023). Increased environmental consciousness as a result of widespread degradation and global warming has resulted in stricter worldwide ecological rules that are beginning to affect international businesses (Chen et al., 2006). In light of the current environmental crisis, businesses are increasingly leaning toward green methods of achieving their objectives. Many sectors have adopted “green” methods in recent years, changing traditional ways of doing business and allocating resources (Albort-Morant et al., 2016; Ince et al., 2023).

Green organizational capital is the stock of a company's organizational expertise, commitment, processes, and systems for managing knowledge for environmental preservation (Chen & Chang, 2012). The firm’s environmental protection goals greatly affect the green organizational capital. In the presence of GHRM practices, a firm can strengthen its policies and procedures to implement environmental protection regulations to reduce pollutants. According to Aust et al. (2020), the GHRM practices through training (motivation and selection of employees) to empower them to follow policies to attain environmental sustainability. The GHRM policies have a significant impact on employees’ efforts as they will become more passionate regarding environmental concerns (Perez et al., 2023). The GHRM policies significantly impact the knowledge-sharing and training process, so the
employees become more passionate regarding environmental concerns.

However, the environmental performance depends upon the green initiative that the organization takes to meet society's expectations by reducing the harmful impacts on the environment (Tam et al., 2006). Therefore, green organizational capital plays an important role in originating a dynamic system in manufacturing firms that can work innovatively under green values to achieve environmental sustainability goals. The current research examines the relationship between green organizational capital and environmental performance (Ly, 2023). Further, this study examines the mediation role of green knowledge sharing between green organizational capital and environmental performance. In this study, GHRM practices will be used as a moderator between green organizational capital and environmental performance.

This research suggests a fresh approach to bridging the gap between them by employing sharing green knowledge. Only a handful of studies have investigated cutting-edge eco-performance (Rubel et al., 2021). Green organizational capital is meaningfully connected to green knowledge sharing. When it comes to the firm's efficiency and long-term viability, green knowledge sharing between employees and managers is a key factor (Rubel et al., 2021). The term “knowledge creation” (or “knowledge acquisition”) is sometimes used interchangeably with “knowledge management”, implying that GKS is a process and product-oriented approach (Song et al., 2020).

This research contributes to the understanding of the relationship between green organizational capital and the environmental performance outcomes of small and medium-sized businesses (SMEs), especially in the light of enhanced management and employees' awareness of the significance of keeping the physical and built environments. Green organizational capital and GHRM practices foster intrinsic skills for working on green knowledge sharing for long-term environmental performance, which is the core emphasis of this research. It is believed the RBV provides a framework for analyzing, forecasting and managing an organization's performance utilizing the AMO theory. Furthermore, this study suggests that GHRM practices may have an indirect effect on green knowledge sharing, implying that green organizational capital influences knowledge sharing in both ways. This study is quantitative. Data were collected through circulating questionnaires in manufacturing firms.

Following that, the work is organized in such a way that the following section introduces the theory and assumptions. Section 2 describes the study's methods, Section 3 presents results, while Section 4 discusses the study's limitations, controversy, and future directions.

1. Theory and hypotheses

To analyze and clarify the environmental performance connection for small and medium-sized enterprises (SMEs) in Pakistan's manufacturing sector, this study draws on the resource-based view (RBV) of the company and the ability-motivation-opportunity (AMO) theory. According to the resource-based view of the firm (RBV; see, for example, (Barney, 2001), a company's ability to gain and maintain a competitive edge in the market is predicated on its ability to use its unique, valuable, and difficult-to-imitate organizational resources. This study employs both the RBV (Barney, 2001) and the AMO (Appelbaum et al., 2000) theoretical lenses to develop our arguments and offers many hypotheses that will be experimentally tested in the section that follows.

1.1. Green organizational capital

As said by Zehnder et al. (2011), green organizational capital relates to certain empowering initiatives that promote and strengthen environmental ideals in a company to create the appropriate process. According to Yadiati (2019), green organizational capital is a collection of qualitative (technology, culture, R&D) management factors that are combined to improve environmental performance. According to Chams and Garcia-Blandón (2019), green organizational capital will assist employees in establishing an indirect connection with enterprises to produce new concepts that contribute to innovation. Green organizational capital is also important for the company's environmental performance because it is used in the management of knowledge.

1.2. Environmental performance

Environmental performance is defined as the organizational initiatives to meet community expectations by making changes in the system and procedure (Fernando & Wah, 2017). Zheng et al. (2021), said that the managers' performance ability to control the organization's risk factor is highly dependent upon the green initiatives adopted by the firms. According to Weng et al. (2015), environmental performance is an initiative of organizations that meets the expected demand of customers by considering the protection of the environment with a set of rules and policies. Different factors that are used to measure the environmental performance in manufacturing firms are KPIs of every task, SDG goals, quality checks, etc. Green organizational capital is liked by firms that show high concern towards technology-oriented tools and processes.

1.3. Mediating role of green knowledge sharing

Green knowledge sharing is an important component of the knowledge management activity of creating, collecting, and maintaining business processes (Harjanti & Noerchoidah, 2017). According to Almahamid et al. (2010), green knowledge-sharing practices have a major positive impact on environmental performance. Gaining and exchanging skills are also related to an organization's competitiveness (Anastasiou, 2019). To convey one's knowledge is a learned behavior (Rubel et al., 2021). In an organization, each member contributes to the body of knowledge and also benefits from the contributions of others (Dias et al., 2019). According to McInerney (2002),
Knowledge sharing involves more than just passing information around; it also entails directing team members to the resources they need to do their jobs. When it comes to motivating employees to engage in innovative behaviors and activities, knowledge sharing is widely regarded as not only crucial, but also as the fundamental instrument for fostering critical thinking and, by extension, upgrading ideas into innovation. Workers need opportunities to learn from and teach one another if they are to generate original ideas. According to Sosa (2007), when workers share information and ideas, everyone benefits from increased professional knowledge, the influx of new ideas, and the stimulation of existing creativity. By disseminating one’s acquired wisdom, one can aid others in the growth of their own action capability.

**H1:** Green organizational capital is positively related to green knowledge sharing.

**H2:** Green knowledge sharing is positively related to environmental performance.

**H3:** Green knowledge sharing mediates the relationship between green organizational capital and environmental performance.

### 1.4. Moderating role of GHRM practices

Uddin and Islam (2015), defined GHRM practices are such practices and policies that help organizations to achieve their goal by protecting the environment from negative impacts. O’Donohue and Torugsa (2016), emphasize the significance of GHRM practices that promote knowledge transfer and engagement with employees in the formulation of a responsive environmental strategy. The reason to promote GHRM practices these days is to make possible production efficiency with the least amount of wastage and to promote employer participation on regular basis (Moin et al., 2021). Ansari et al. (2021), highlighted that GHRM practices play a vital role in protecting environmental sustainability. When employees get involved in GHRM practices they will become more passionate about environmental concerns). Furthermore, existing literature suggests that firms should hire workers by drawing upon their environmental beliefs & values, and knowledge (Renwick et al., 2013) as part of a green recruitment and selection system. This is done to increase the likelihood that newly hired workers will share the company’s commitment to environmental sustainability (Jackson & Seo, 2010).

**H4:** GHRM moderates the relationship between green organizational capital and environmental performance.

Here, this study proposes a conceptual research model (Figure 1) that is empirically tested based on a thorough analysis of the existing literature and the development of testable hypotheses.

![](image)

**Figure 1. Conceptual research framework**

### 2. Methods

#### 2.1. Sample and procedure

This study aims to target the manufacturing industries of Lahore, Pakistan. It gives a border perspective for the enhancement of green organizational capital policies and GHRM practices in the organization that will affect the dynamic abilities of the firm to achieve innovation and enhance environmental performance. The data were collected through the questionnaire in manufacturing firms. The data to test the model was precisely designed for SMEs in Pakistan. Thus, a sample of 150 manufacturing firms in Pakistan was surveyed. This study also focuses on the perception of employees working in the manufacturing industries and how they relate to environmental performance. Further to maintain authentic data an additional check was maintained by fetching information from the managers and engineers because will have a better understanding of the importance of green innovation and environmental concerns. To test the hypotheses SPSS 25 was used.

#### 2.2. Measuring instruments

**Green organizational capital (GOC)** this article, this study will use “green organizational capital” as the independent variable. When evaluating a company’s commitment to sustainability, a 4-point scale will be employed. Each item will be rated on a 7-point Likert scale based on the criteria established by (Darnall et al., 2008). “We are strengthening our environmental communication systems is an example of the sort of thing that will be included in the research” (Cronbach’s alpha: .721).

**Environmental Performance (EP)** this research is contingent on how well the environment performs. The environmental effects will be assessed on a 5-point scale. Utilizing the items of Daily et al. (2012), having a 7-point Likert scale. The study uses the statement “Environmental activities in my organization have greatly enhanced product and quality” as its sample item (Cronbach’s alpha: .780).

**Green knowledge sharing (GKS)** This research utilized a 4-item scale developed by Chennamaneni et al. (2012), to gauge the dissemination of environmentally friendly information. To determine how effective green information exchange is, four criteria are employed. Each item will be graded on a seven-point Likert scale ranging from “Strongly Disagree” to “Strongly Agree”. The scale’s items include statements like “I shared factual knowledge (know what) from work with my employees” (Cronbach’s alpha: .725).

**Green HRM (GHRM)** Human resource management (HRM) approaches that focus on sustainability operates as a moderator between adaptable competencies and environmentally friendly innovations. To quantify green HRM initiatives, a 13-point scale has been developed. As measured by Longoni et al. (2018). The study’s representative item, “employee gets reward for developing specified environmental competencies”, is rated on a 7-point Likert scale (Cronbach’s alpha: .820).
3. Results

In this section, the study will go through what to learn about the methodology and framework of the study. Everything from criteria for choosing participants to specific methods of data analysis, quantitative measures, and outcomes are all included. To test the descriptive statistics, reliability, and correlations between variables are displayed in the Table 1.

Table 1. Descriptive Statistics, Reliability, and Correlations

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Green Organizational Capital</td>
<td>2.322</td>
<td>1.032</td>
<td>(0.721)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2: GHRM</td>
<td>2.756</td>
<td>1.005</td>
<td>0.629** (0.820)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3: Green knowledge sharing</td>
<td>5.034</td>
<td>1.109</td>
<td>0.456** 0.518**(0.725)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4: Environmental Performance</td>
<td>2.598</td>
<td>0.960</td>
<td>0.506** 0.663** 0.496** (0.780)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: N = 190; ** P < 0.01; * P < .05.

Positive and substantial relationships between green organizational capital and Environmental Performance ($r = 0.506, P 0.01$), GHRM practices ($r = 0.629, P 0.01$), and green knowledge sharing ($r = 0.456, P 0.01$) were found. There is a good correlation between GHRM and the development of additional green knowledge sharing ($r = 0.518, P 0.01$). There is a favorable and statistically significant correlation between GHRM and environmental performance ($r = 0.663, P 0.01$). Furthermore, there was a favorable and statistically significant correlation between Green knowledge sharing and environmental performance ($r = 0.496, P 0.01$).

3.2. Mediation analysis

SPSS v21 and Hayes’ PROCESS v3.0 were used to analyze the data (5000 random samples) and investigate the possibility of mediation (Model 4). The mediation analysis was put through its paces using the Hayes approach shown in Table 2 (Model 4).

Table 2. Mediation Result Analysis

<table>
<thead>
<tr>
<th>GOC → GKS →EP</th>
<th>Effect</th>
<th>S.E</th>
<th>LLCI</th>
<th>ULCI</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Effect</td>
<td>.4925</td>
<td>.0647</td>
<td>.3717</td>
<td>.6133</td>
<td>.00</td>
</tr>
<tr>
<td>Direct Effect</td>
<td>.3440</td>
<td>.0647</td>
<td>.2163</td>
<td>.4717</td>
<td>.00</td>
</tr>
<tr>
<td>Indirect Effect</td>
<td>.1484</td>
<td>.0323</td>
<td>.0884</td>
<td>.2139</td>
<td>sig</td>
</tr>
</tbody>
</table>

Note: N = 190. Reported estimates are Unstandardized; SE = standard error; LLCI = lower limit confidence interval; ULCI = upper limit confidence interval.

According to the results, it is found that all results are inline and mediation exists. Specifically, hypothesis 3 states that green innovation mediates a positive and significant association between green organizational capital and environmental performance. A favorable and statistically significant mediation effect of green knowledge sharing was also found between GOC and EP.

3.3. Moderation analysis

Table 3. Moderation Analysis Results

<table>
<thead>
<tr>
<th>GKS</th>
<th>Variables</th>
<th>β</th>
<th>S.E</th>
<th>t</th>
<th>P</th>
<th>LL CI 95%</th>
<th>UL CI 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GOC</td>
<td>.2006</td>
<td>.1024</td>
<td>1.9591</td>
<td>.0516</td>
<td>–.0014</td>
<td>.4025</td>
</tr>
<tr>
<td></td>
<td>GHRM</td>
<td>.4612</td>
<td>.0985</td>
<td>4.6815</td>
<td>.0000</td>
<td>.2668</td>
<td>.6555</td>
</tr>
<tr>
<td></td>
<td>GOC*GHRM</td>
<td>.0572</td>
<td>.1072</td>
<td>.5336</td>
<td>.5943</td>
<td>–.1542</td>
<td>.2686</td>
</tr>
</tbody>
</table>

To evaluate moderation, the data was run through SPSS v21 and Hayes PROCESS v3.0. The outcomes are detailed in the Table 3. As can see that GHRM is a moderator between green organizational capital and green knowledge sharing not supported because the value of $p>0.05$ and the value of LLCI and ULCI did not support it. This study can conclude that Hypothesis H4 is not correct.

4. Discussion

The main aim of this research is to analyze the impact of green organizational capital on environmental performance in a manufacturing firm. The study seeks to determine the influence of green knowledge sharing (GKS) in the manufacturing industries of Pakistan’s private-sector employees. Green knowledge sharing plays a mediating role with a positive and significant impact between green organizational capital (GOC) and environmental performance.
performance (EP). So, hypothesis H2 supports this. Furthermore, the study examines the role of green HRM practices (GHRM) practices in the presence of green knowledge sharing (GKS) and green organizational capital (GOC) on environmental performance (EP) with a negative impact. So, H4 did not support it. Our findings are in line with direct results but not supporting moderating results in developing countries’ context. The reason is that in developing countries HR is not practicing green trainees with their employees. So there is a need to focus on it to compete globally. So, all the hypotheses are in line with the literature except H4.

4.1. Theoretical implications
This study contributes to the advancement of the Resource-based (Barney, 2001) and the AMO theory (Guest, 2011) in describing and comprehending the aspects that lead to enterprises’ innovative and ecologically friendly performance. Based on our findings, it is contended that GOC is a critical asset that enterprises may employ to influence green knowledge sharing and environmental performance through the application of GHRM. This integrates the Resource-based view and the AMO theories to demonstrate how green HRM practices and creative leaders improve firm performance (Singh et al., 2020).

4.2. Practical implications
Our research provides numerous important recommendations for business leaders and managers on how to implement green knowledge sharing and capitalize on it to outperform competitors in the market while also improving environmental performance. This study proposes that a company’s investment in environmental management can help it gain credibility with its key constituents, who are increasingly demanding and pressuring businesses to adopt green practices across the board. Based on the findings of this study, business leaders should encourage green organizational capital and reward leadership behaviours to promote HRM’s environmental and social benefits. To support a company’s plan to compete through green processes and green products, green human resource management strategies are crucial for attracting, developing, and retaining workers who share those values.

According to our findings, senior management should prioritize the connection of environment protection goals with green human resource management practices and employees to foster and sustain green product and method innovation. This study suggests a flat structure and a development culture as conditions for GHRM practices to further stimulate and improve green knowledge exchange for a long-term competitive advantage.

Limitations and future directions
The study acknowledges the shortcoming and provides suggestions for additional investigation. The first limitation of our study is that it was only done among manufacturing SMEs in Pakistan. This limits the study’s applicability to other types of SMEs. As a result, it suggests that future studies in Pakistan employ our proposed research framework to investigate SMEs in Pakistan’s service sector. Secondly, the moderating influence of human resource management on performance was not studied in terms of an employee-level construct – environmental beliefs and values. As a result, the study proposes that future researchers expand on our current research technique to investigate the impact of green HRM on green knowledge sharing, using employee values and beliefs toward the environment as a moderator.

Conclusions
This review of significant studies on GHRM practices concludes that manufacturing companies can enhance their environmental performance sustainably by deeper comprehension and broadening the range and quality of such efforts. As a relatively new concept in developing nations, GHRM must be recognized for enterprises to match their specific priorities with environmentally friendly HR practices. Green HR strategies such as green assessment and job titles, recruiting and selection, green environmental training, and green awards all play a significant part in attaining long-term organizational performance. In other words, organizations will not be able to achieve such outcomes until they integrated and unified green HRM practices. Overall, the research throws new insight into the essential direct and indirect role of green knowledge sharing in long-term success. The findings indicate that effective green information sharing is greatest to boost employees’ capacities to accomplish sustainable performance.

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References


