

**Impact of Environmental Awareness on Green Practices in SMEs: A Moderated Mediation Approach**

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**Abstract**

This study investigates the determinants of green practice adoption among Small and Medium Enterprises (SMEs) in Pakistan by integrating environmental awareness, organizational readiness, and regulatory pressure into a comprehensive framework. Drawing on the Resource-Based View (RBV) and institutional theory, the study examines both the direct and indirect effects of environmental awareness on the adoption of green practices, as well as the conditional role of regulatory pressure.

A quantitative, cross-sectional research design was employed, and data were collected from 287 SME owners and managers across major cities in Pakistan. Statistical analyses, including regression and PROCESS macro (Model 7), were conducted to test the proposed hypotheses involving mediation and moderation effects.

The findings reveal that environmental awareness significantly influences green practice adoption; however, this relationship is partially mediated by organizational readiness, highlighting the importance of internal capabilities in translating awareness into action. Furthermore, regulatory pressure positively moderates the relationship between environmental awareness and organizational readiness, indicating that stronger regulatory environments enhance SMEs' responsiveness toward sustainability initiatives.

The study contributes to the literature by providing empirical evidence from a developing economy and offering an integrated perspective that combines cognitive, organizational, and institutional factors. Practically, the findings suggest that policymakers should strengthen regulatory frameworks and provide financial and technical support to SMEs, while managers should focus on building organizational capabilities to effectively implement green practices.

**Keywords:** Green Practice Adoption, Environmental Awareness, Organizational Readiness, Regulatory Pressure, SMEs, Pakistan, Sustainability, Resource-Based View (RBV), Moderated Mediation, And Environmental Management.

### Introduction

Environmental sustainability has emerged as a critical concern for businesses worldwide, driven by increasing environmental degradation, climate change, and resource scarcity (Rana et al., 2024; Irshad et al., 2024). Organizations are now expected to balance economic growth with environmental responsibility by adopting sustainable practices that minimize their ecological footprint (Atif et al., 2024). While large corporations have made considerable progress in integrating environmental strategies into their operations, Small and Medium Enterprises (SMEs) remain relatively underexplored despite their substantial contribution to economic development and environmental impact (Khan et al., 2021; Alam et al., 2025). In developing countries such as Pakistan, SMEs constitute a dominant segment of the economy, contributing significantly to employment generation, industrial output, and export earnings (Mumtaz et al., 2025). However, their role in environmental sustainability is increasingly scrutinized due to inefficient resource utilization, limited technological capabilities, and weak adherence to environmental regulations (ul Hassan et al., 2023; Fahad et al., 2025).

The adoption of green practices—defined as environmentally friendly processes, technologies, and managerial actions aimed at reducing negative environmental impacts—has become a strategic imperative for SMEs (Gul et al., 2024; Hanif et al., 2023). These practices include energy efficiency, waste minimization, recycling, eco-design, and sustainable sourcing. Beyond environmental benefits, green practices offer economic advantages such as cost reduction, improved operational efficiency, enhanced brand image, and access to environmentally conscious markets (Arshad et al., 2025; Khan et al., 2020). Despite these potential benefits, the adoption of green practices among SMEs in developing economies remains uneven and often limited (ul Hassan et al., 2020; Kakakhel et al., 2016). This raises important questions regarding the factors that drive or hinder sustainability initiatives in such contexts.

In Pakistan, SMEs face unique structural and institutional challenges that affect their ability to adopt green practices. These challenges include financial constraints, lack of technical expertise, inadequate infrastructure, and limited access to green technologies (Gul et al., 2019; Hassan et al., 2026). Furthermore, weak regulatory enforcement and insufficient government support further exacerbate these barriers (Khan et al., 2021; Alam et al., 2025). At the same time, increasing globalization, rising consumer awareness, and pressure from international markets are creating new opportunities for SMEs to engage in sustainable practices (Rana et al., 2024; Irshad et al., 2024). This duality of challenges and opportunities underscores the need for a deeper understanding of the mechanisms influencing green practice adoption in Pakistani SMEs.

Among the various determinants of environmental sustainability, environmental awareness has been widely recognized as a fundamental driver of organizational

behavior (Gul et al., 2021; Hanif et al., 2023). Environmental awareness reflects the extent to which business owners and managers understand environmental issues, recognize their impact, and are motivated to take corrective actions. In SMEs, where decision-making is often centralized, the awareness and attitudes of owners and managers play a crucial role in shaping organizational strategies (ul Hassan et al., 2025). Firms with higher environmental awareness are more likely to perceive sustainability as a strategic priority rather than merely a regulatory obligation (Atif et al., 2024). This awareness not only fosters proactive environmental behavior but also enhances the firm's ability to identify opportunities for innovation and competitive advantage (Gul et al., 2025).

However, awareness alone may not be sufficient to ensure the successful adoption of green practices. The translation of environmental awareness into concrete actions depends largely on the firm's internal capabilities and resources, collectively referred to as organizational readiness (Arshad et al., 2025; Mumtaz et al., 2025). Organizational readiness encompasses financial capacity, technological infrastructure, human resource skills, and managerial commitment required to implement sustainability initiatives (ul Hassan et al., 2023). In many Pakistani SMEs, limited access to these resources poses a significant barrier to the adoption of green practices (Fahad et al., 2025). Even when managers are aware of the benefits of sustainability, they may lack the necessary means to implement environmentally friendly technologies or processes.

This highlights the importance of examining organizational readiness as a mediating mechanism that links environmental awareness to green practice adoption. Drawing on the Resource-Based View (RBV), firms with adequate resources and capabilities are better positioned to translate their strategic intentions into tangible outcomes (Barney, 1991; Gul et al., 2024). Organizational readiness enables SMEs to overcome implementation barriers, invest in green technologies, and integrate sustainability into their core operations.

In addition to internal factors, external pressures also play a critical role in shaping SMEs' environmental behavior. Regulatory pressure, in particular, has been identified as a key institutional force influencing the adoption of green practices (Khan et al., 2020; Rana et al., 2024). Regulatory pressure refers to the extent to which government policies, environmental laws, and enforcement mechanisms compel firms to comply with environmental standards. In developing countries like Pakistan, regulatory frameworks often suffer from weak enforcement and limited institutional capacity (ul Hassan et al., 2020).

Despite these limitations, regulatory pressure can still influence SMEs' behavior by creating a sense of accountability and urgency (Irshad et al., 2024). Firms operating under stricter regulatory environments are more likely to invest in organizational capabilities required for compliance, thereby enhancing their readiness for green practice adoption (Atif et al., 2024). Moreover, regulatory pressure can strengthen the relationship between environmental awareness and organizational readiness by encouraging firms to act on their awareness.

Given this context, there is a growing need for empirical research that examines the interplay between environmental awareness, organizational readiness, and regulatory pressure in influencing green practice adoption among SMEs in Pakistan. This study addresses this gap by proposing a comprehensive framework that integrates mediating and moderating mechanisms.

### **Literature Review**

#### **Green Practice Adoption in SMEs**

The increasing global emphasis on environmental sustainability has compelled organizations across sectors to integrate environmentally responsible practices into their operations. This shift is largely driven by growing concerns over climate change, resource depletion, and environmental degradation, which have placed pressure on firms to adopt sustainable business models (Hanif et al., 2023; Alam et al., 2025). While large organizations have made notable progress in this regard, Small and Medium Enterprises (SMEs) have received comparatively less attention despite their substantial contribution to both economic development and environmental impact. In developing economies such as Pakistan, SMEs account for a significant share of industrial activity and employment, making their role in environmental sustainability particularly important (Khan et al., 2021; Mumtaz et al., 2025).

Green practice adoption refers to the implementation of environmentally friendly processes, technologies, and managerial initiatives aimed at minimizing ecological harm. These practices include energy efficiency, waste reduction, recycling, eco-design, and sustainable sourcing (Gul et al., 2024; Arshad et al., 2025). The adoption of such practices not only contributes to environmental protection but also enhances operational efficiency, reduces costs, and improves organizational reputation. However, SMEs in developing countries often face significant barriers to adopting green practices due to limited financial resources, lack of technical expertise, and weak institutional support (ul Hassan et al., 2023; Fahad et al., 2025).

Existing literature suggests that the adoption of green practices is influenced by a combination of internal and external factors. Internal factors include environmental awareness, organizational capabilities, and managerial attitudes, while external factors encompass regulatory pressure, market demand, and stakeholder expectations (Rana et al., 2024; Irshad et al., 2024). Understanding how these factors interact is crucial for developing effective strategies to promote sustainability in SMEs, particularly in emerging economies where institutional frameworks are still evolving.

#### **Environmental Awareness and Green Practice Adoption**

Environmental awareness has been widely recognized as a fundamental driver of organizational behavior toward sustainability. It reflects the extent to which individuals within an organization, particularly owners and managers, understand environmental issues and recognize the importance of adopting environmentally responsible practices (Gul et al., 2021; Atif et al., 2024). In SMEs, where decision-making is often centralized, the awareness and attitudes of top management play a critical role in shaping strategic priorities and operational practices.

Firms with higher levels of environmental awareness are more likely to perceive sustainability as an opportunity rather than a constraint. This perception encourages them to adopt green practices that not only reduce environmental impact but also enhance competitiveness and long-term performance (Rana et al., 2024). For example, environmentally aware SMEs may invest in energy-efficient technologies, adopt waste management practices, and comply with environmental standards to improve their market position and attract environmentally conscious customers.

Empirical evidence supports the positive relationship between environmental awareness and green practice adoption. Studies have shown that awareness contributes to improved organizational reputation, customer trust, and operational efficiency (Irshad et al., 2024). In export-oriented SMEs, awareness of international environmental standards further drives the adoption of green practices, as compliance becomes essential for accessing global markets (Khan et al., 2020). However, despite its importance, environmental awareness alone may not be sufficient to ensure the successful implementation of sustainability initiatives.

### **H1: Environmental awareness has a positive and significant relationship with the adoption of green practices in Pakistani SMEs.**

#### **Mediating Role of Organizational Readiness**

While environmental awareness creates the intention to adopt green practices, the actual implementation of such practices depends on the firm's ability to mobilize the necessary resources and capabilities. This highlights the importance of organizational readiness as a mediating variable in the relationship between awareness and adoption. Organizational readiness refers to the extent to which a firm possesses the financial, technological, and human resources required to implement sustainability initiatives (Arshad et al., 2025; ul Hassan et al., 2025).

In the context of Pakistani SMEs, organizational readiness is often constrained by limited access to capital, lack of technical expertise, and inadequate infrastructure. These constraints can prevent firms from translating their environmental awareness into concrete actions (Gul et al., 2019; Fahad et al., 2025). For instance, adopting energy-efficient technologies or implementing waste management systems may require significant upfront investment, which many SMEs are unable to afford.

Despite these challenges, firms that demonstrate higher levels of readiness are better positioned to adopt green practices successfully. Organizational readiness enables SMEs to overcome implementation barriers by facilitating access to resources, enhancing technical capabilities, and fostering managerial commitment. It also reflects the organization's willingness to embrace change and invest in sustainable practices as part of its strategic agenda.

Furthermore, environmental awareness is expected to positively influence organizational readiness. Firms that recognize the importance of sustainability are more likely to allocate resources and develop capabilities necessary for implementing green practices. This relationship underscores the role of awareness as a precursor to readiness, which in turn drives adoption.

**H2: Environmental awareness has a positive and significant relationship with organizational readiness for green practice adoption.**

**Organizational Readiness and Green Practice Adoption**

Organizational readiness plays a critical role in determining whether SMEs can effectively implement green practices. It encompasses both tangible resources, such as financial capital and technological infrastructure, and intangible factors, such as managerial commitment and organizational culture (Mumtaz et al., 2025). Firms with higher levels of readiness are more capable of overcoming barriers associated with sustainability initiatives, including high costs, lack of expertise, and operational complexities.

Empirical studies have consistently demonstrated a strong positive relationship between organizational readiness and green practice adoption (ul Hassan et al., 2023). SMEs that possess adequate resources and capabilities are more likely to invest in eco-friendly technologies, adopt sustainable production processes, and comply with environmental regulations. Additionally, supportive leadership and a culture that values sustainability further enhance the firm's readiness and facilitate the adoption process.

In the Pakistani context, external support mechanisms such as government incentives, training programs, and industry collaborations can play a significant role in enhancing organizational readiness. By providing access to financial resources and technical knowledge, these initiatives can help SMEs overcome resource constraints and adopt green practices more effectively.

**H3: Organizational readiness has a positive and significant relationship with the adoption of green practices in Pakistani SMEs.**

**Mediating Effect of Organizational Readiness**

The mediating role of organizational readiness can be better understood through the lens of the Resource-Based View (RBV), which emphasizes the importance of internal resources and capabilities in achieving competitive advantage (Barney, 1991). According to this perspective, firms must possess valuable, rare, and inimitable resources to successfully implement strategic initiatives, including sustainability practices.

In this context, organizational readiness acts as a mechanism through which environmental awareness influences green practice adoption. While awareness creates the motivation to adopt sustainable practices, readiness determines the firm's ability to execute these intentions. This suggests that the relationship between environmental awareness and green practice adoption is not direct but rather mediated by the firm's internal capabilities (Gul et al., 2024).

This mediation effect provides a more nuanced understanding of the adoption process by highlighting the interplay between cognitive and structural factors. SMEs that are both aware of environmental issues and equipped with the necessary resources are more likely to achieve successful implementation of green practices. Conversely, firms with high awareness but low readiness may struggle to translate their intentions into action.

**H4: Organizational readiness mediates the relationship between environmental awareness and the adoption of green practices in Pakistani SMEs.**

**Moderating Role of Regulatory Pressure**

In addition to internal factors, external forces such as regulatory pressure play a crucial role in shaping SMEs' environmental behavior. Regulatory pressure refers to the extent to which government policies, environmental regulations, and enforcement mechanisms compel firms to adopt sustainable practices (Khan et al., 2020; Rana et al., 2024). It represents an important institutional driver that can influence both the motivation and capability of firms to engage in environmental initiatives.

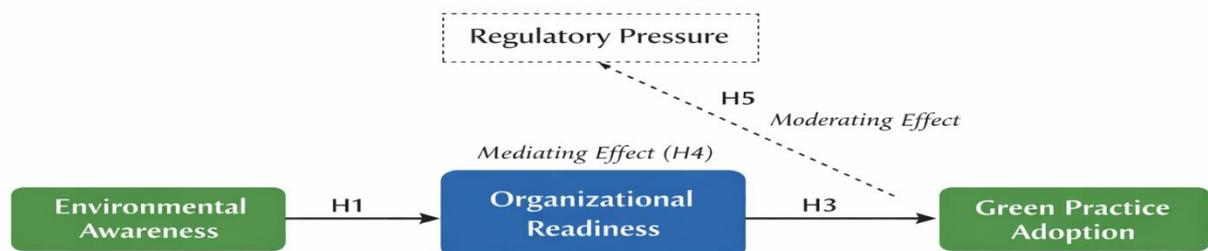
In developing economies like Pakistan, regulatory frameworks are often characterized by weak enforcement and limited institutional capacity. However, even in such contexts, regulatory pressure can have a significant impact on SME behavior by creating a sense of accountability and urgency (Irshad et al., 2024). Firms operating under stricter regulatory environments are more likely to invest in organizational capabilities required for compliance, thereby enhancing their readiness for green practice adoption.

Moreover, regulatory pressure can strengthen the relationship between environmental awareness and organizational readiness. When firms face strong regulatory demands, they are more likely to act on their awareness and allocate resources toward sustainability initiatives. This moderating effect highlights the importance of external institutional factors in shaping the effectiveness of internal drivers.

**H5: Regulatory pressure positively moderates the relationship between environmental awareness and organizational readiness, such that the relationship is stronger when regulatory pressure is high.**

**Theoretical Framework**

**Figure 1:**



## Methodology

### Research Design

This study employed a **quantitative, cross-sectional research design** to examine the factors influencing the adoption of green practices among SMEs in Pakistan. A survey-based approach was adopted to collect primary data from SME owners and managers, as they are the key decision-makers regarding environmental practices.

### Population and Sampling

The target population comprised SMEs operating in the **manufacturing and service sectors** across major cities of Pakistan, including Islamabad, Karachi, Lahore, and Faisalabad. A **convenience sampling technique** was used due to accessibility constraints.

A total of **350 questionnaires** were distributed, out of which **287 valid responses** were received, yielding a response rate of **82%**, which is considered acceptable for social science research.

### Data Collection Procedure

Data were collected through **structured questionnaires** administered both physically and online. Respondents were assured of confidentiality and anonymity to reduce response bias.

### Measurement of Variables

All constructs were measured using **previously validated scales** on a **5-point Likert scale** (1 = Strongly Disagree, 5 = Strongly Agree).

**Environmental Awareness (EA)** – adapted from prior environmental management studies (5 items)

**Organizational Readiness (OR)** – measured using resource and capability indicators (6 items)

**Regulatory Pressure (RP)** – measured through perceived regulatory enforcement (4 items)

**Green Practice Adoption (GPA)** – measured through sustainability practices (6 items)

## Data Analysis Techniques

Data were analyzed using **SPSS and PROCESS Macro (Model 7)** for:

Descriptive statistics

Reliability analysis (Cronbach's Alpha)

Correlation analysis

Regression analysis

Mediation and moderation analysis

## Data Analysis and Results

### Descriptive Statistics and Reliability Analysis

**Table 1**  
*Descriptive Statistics and Reliability*

Variable	Mean	SD	Cronbach's Alpha
<b>Environmental Awareness</b>	3.72	0.64	0.87
<b>Organizational Readiness</b>	3.45	0.71	0.89
<b>Regulatory Pressure</b>	3.31	0.68	0.84
<b>Green Practice Adoption</b>	3.58	0.66	0.91

**Interpretation**

The results indicate that all variables have mean values above 3, suggesting a **moderate to high level** of agreement among respondents. Green practice adoption (M = 3.58) indicates that SMEs are somewhat engaged in sustainable activities but not at an advanced level.

Cronbach's alpha values for all constructs exceed **0.70**, confirming **strong internal consistency and reliability** of the measurement scales.

**Correlation Analysis**

**Table 2**  
*Correlation Matrix*

Variable	EA	OR	RP	GPA
<b>EA</b>	1			
<b>OR</b>	.52**	1		
<b>RP</b>	.41**	.46**	1	
<b>GPA</b>	.55**	.63**	.48**	1

**Note: p < 0.01**

**Interpretation**

Environmental awareness is **positively and significantly correlated** with green practice adoption (r = .55), supporting the preliminary assumption of H1. Organizational readiness shows the **strongest correlation** with green practice adoption (r = .63), indicating its central role.

Regulatory pressure also has a significant positive relationship with all variables, suggesting its relevance as a contextual factor.

**Regression Analysis**

Direct Effect of Environmental Awareness on Green Practice Adoption

**Table 3**  
*Regression Results (H1)*

Predictor	$\beta$	t-value	p-value
<b>Environmental Awareness</b>	0.48	8.92	0.000
<b>R<sup>2</sup> = 0.30</b>			

Interpretation

Environmental awareness has a **significant positive effect** on green practice adoption ( $\beta = 0.48$ ,  $p < 0.001$ ). This supports **H1**, indicating that SMEs with higher awareness are more likely to adopt sustainable practices.

**Mediation Analysis (PROCESS Model 4)**

Step 1: EA → OR

**Table 4**

Predictor	$\beta$	t-value	p-value
<b>Environmental Awareness</b>	0.52	9.11	0.000

Step 2: OR → GPA

**Table 5**

Predictor	$\beta$	t-value	p-value
<b>Organizational Readiness</b>	0.57	10.34	0.000

Step 3: Mediation Effect

**Table 6**

*Indirect Effect*

**Effect Type Value Boot SE 95% CI Lower 95% CI Upper**

Indirect Effect 0.30 0.05 0.21 0.41

Interpretation

Environmental awareness significantly predicts organizational readiness ( $\beta = 0.52$ ), supporting **H2**. Organizational readiness significantly predicts green practice adoption ( $\beta = 0.57$ ), supporting **H3**.

The indirect effect (0.30) is significant as the confidence interval does not include zero, confirming **mediation**. Thus, **H4 is supported**, indicating that organizational readiness partially mediates the relationship between environmental awareness and green practice adoption.

**5. Moderation Analysis (PROCESS Model 7)**

Interaction Effect (EA × RP → OR)

**Table 7**

Predictor	$\beta$	t-value	p-value
<b>Environmental Awareness</b>	0.39	6.12	0.000
<b>Regulatory Pressure</b>	0.28	4.85	0.000
<b>EA × RP (Interaction Term)</b>	0.19	3.47	0.001
<b>R<sup>2</sup> = 0.41</b>			

Interpretation

The interaction term is **positive and significant** ( $\beta = 0.19$ ,  $p < 0.01$ ), supporting **H5**. This indicates that regulatory pressure **strengthens the relationship** between environmental awareness and organizational readiness.

Under high regulatory pressure, SMEs are more likely to convert awareness into readiness for adopting green practices.

### Conditional Effects of Moderation

**Table 8**

*Conditional Effects of EA on OR at Different Levels of RP*

Regulatory Pressure	Effect ( $\beta$ )	p-value
Low (-1 SD)	0.31	0.000
Mean	0.52	0.000
High (+1 SD)	0.71	0.000

#### Interpretation

The effect of environmental awareness on organizational readiness becomes **stronger as regulatory pressure increases**, confirming the moderating role. At high regulatory pressure ( $\beta = 0.71$ ), the relationship is substantially stronger compared to low pressure ( $\beta = 0.31$ ).

#### Summary of Hypotheses Testing

Hypothesis	Statement	Result
H1	EA $\rightarrow$ GPA	Supported
H2	EA $\rightarrow$ OR	Supported
H3	OR $\rightarrow$ GPA	Supported
H4	Mediation (OR)	Supported
H5	Moderation (RP)	Supported

The findings demonstrate that **environmental awareness alone is not sufficient** to ensure green practice adoption. Instead, it must be supported by **organizational readiness**, which acts as a key mechanism translating awareness into action.

Additionally, **regulatory pressure plays a crucial boundary condition**, enhancing SMEs' responsiveness toward sustainability. The combined effect highlights that both **internal capabilities and external pressures** are essential for promoting green practices in Pakistani SMEs.

### Discussion

The present study aimed to examine the factors influencing the adoption of green practices among Pakistani SMEs by integrating environmental awareness, organizational readiness, and regulatory pressure into a unified framework. The findings provide strong empirical support for the proposed model and offer several important insights.

First, the results confirm that **environmental awareness significantly influences green practice adoption**, supporting prior research that highlights awareness as a foundational driver of sustainable behavior. SMEs with higher levels of environmental understanding are more likely to recognize the long-term benefits of sustainability, including cost efficiency, improved reputation, and market competitiveness. In the Pakistani context, where formal environmental education and structured sustainability initiatives are still evolving, awareness emerges as a critical

starting point for change. However, the moderate level of green practice adoption observed suggests that awareness alone does not guarantee implementation.

Second, the study underscores the pivotal role of **organizational readiness** as both a direct predictor and a mediator. The significant relationship between environmental awareness and organizational readiness indicates that awareness enhances firms' preparedness to adopt green practices by motivating resource allocation and capability development. More importantly, the mediation results reveal that organizational readiness serves as a key mechanism through which awareness translates into action. This finding aligns with the **Resource-Based View (RBV)**, emphasizing that internal resources—such as financial capacity, technical expertise, and managerial support—are essential for achieving strategic outcomes. In many Pakistani SMEs, limited access to these resources remains a major barrier, explaining why awareness does not always lead to adoption.

Third, the moderating role of **regulatory pressure** provides valuable insight into the influence of external forces. The findings demonstrate that regulatory pressure strengthens the relationship between environmental awareness and organizational readiness. Under conditions of high regulatory enforcement, SMEs are more likely to act on their awareness and invest in the necessary resources for sustainability. This suggests that even in developing economies with relatively weak institutional frameworks, regulatory mechanisms can play a catalytic role in promoting environmental practices. It also highlights the importance of consistency and enforcement in environmental policies.

Overall, the study highlights that green practice adoption in SMEs is not driven by a single factor but rather by the **interaction of cognitive (awareness), organizational (readiness), and institutional (regulatory pressure) elements**. The findings provide a nuanced understanding of how these factors work together to influence sustainability outcomes.

### Conclusion

This study contributes to the growing body of literature on environmental sustainability by examining the adoption of green practices in Pakistani SMEs through an integrated framework. The results indicate that while environmental awareness is a necessary condition for sustainability, it is not sufficient on its own. Organizational readiness plays a central role in enabling SMEs to convert awareness into actionable strategies, while regulatory pressure enhances this process by reinforcing accountability and motivation.

The study concludes that **green practice adoption is a multi-dimensional process** requiring both internal capabilities and external support mechanisms. SMEs that possess higher levels of readiness and operate under stronger regulatory environments are more likely to successfully implement sustainable practices.

In the context of Pakistan, where SMEs face significant resource constraints and institutional challenges, promoting environmental sustainability requires a coordinated effort involving businesses, policymakers, and supporting institutions.

The findings emphasize that improving awareness must be complemented by enhancing organizational capacity and strengthening regulatory frameworks.

### Implications

#### Theoretical Implications

This study makes several important contributions to theory. First, it extends the literature on environmental sustainability by integrating **environmental awareness, organizational readiness, and regulatory pressure** into a single model. Second, it provides empirical support for the **Resource-Based View (RBV)** by demonstrating the mediating role of organizational readiness. Third, the study contributes to institutional theory by highlighting the moderating role of regulatory pressure in shaping organizational behavior. This integrated perspective offers a more comprehensive understanding of green practice adoption, particularly in developing economies.

#### Practical Implications

From a managerial perspective, the findings suggest that SME owners and managers should view green practices not merely as a compliance requirement but as a **strategic opportunity**. Investing in employee training, technological upgrades, and resource development can significantly enhance organizational readiness and facilitate sustainability initiatives. SMEs should also actively seek partnerships with industry associations and financial institutions to overcome resource constraints.

#### Policy Implications

The study provides clear guidance for policymakers. There is a need to:  
Develop **financial incentive programs** such as green loans and subsidies  
Provide **technical training and capacity-building initiatives** for SMEs  
Strengthen **regulatory enforcement mechanisms** to ensure compliance  
Promote **awareness campaigns** to educate SME owners about sustainability benefits  
A coordinated policy approach can significantly enhance the adoption of green practices and contribute to national environmental goals.

#### Future Research Directions

While this study offers valuable insights, it also opens several avenues for future research.

First, future studies can adopt a **longitudinal research design** to examine how green practice adoption evolves. A cross-sectional approach limits the ability to capture dynamic changes and causal relationships.

Second, researchers can expand the model by incorporating additional variables such as **green innovation, leadership commitment, organizational culture, or digital transformation**, which may further explain sustainability adoption.

Third, comparative studies across different regions or countries can provide a broader understanding of how institutional contexts influence SME behavior. This would enhance the generalizability of the findings.

Fourth, future research can employ **advanced analytical techniques such as Structural Equation Modeling (SEM)** to validate the proposed framework and examine complex relationships more robustly.

Finally, qualitative or mixed-method approaches can provide deeper insights into the **context-specific challenges and decision-making processes** of SME owners, which are often not fully captured through quantitative methods.

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