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Green Management Practice and Environmental Performance: A Cross-Country Study of Corporate Sustainability Practice

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Abstract

This study investigates the relationships among Green Management Practice (GMP), Employee Environmental Engagement (EEE), and Environmental Perfor-mance (EP) across developed and developing economies, while testing the moder-ating effect of Country Context (CC). As a GMP strategy rooted in the Resource-Based View (RBV), the investigation seeks to explain how green management prac-tices can enhance sustainability outcomes via employee engagement across diverse institutional frameworks. The research was conducted using a quantitative, cross-country survey approach, collecting data from 199 GM practitioners based in vari-ous companies in Pakistan, Bangladesh, Bahrain, the Middle East, and the United States through stratified sampling. Stratification was based on the World Bank's (2024) income-level classifications to represent developed and developing country contexts.

The data were analyzed using Partial Least Squares Structural Equation Mod-eling (PLS-SEM). All the proposed hypotheses were supported except one. GMP impacted EP directly and significantly and impacted EEE strongly, which signifi-cantly predicted EP. EEE's mediation of the effect of GMP on EP was validated, confirming the vital behavioral route by which management processes shape envi-ronmental outcomes. The moderating effect of Country Context was weakly signif-icant but implies that both the institutional and cultural context affect the degree to which these relationships hold.

The results are of theoretical and practical significance by advancing GMP lit-erature into multi-country contexts while providing practical recommendations for managers seeking to integrate management and sustained developmental objectives. This research also guides policymakers on the contextual determinants of green management application, underpinning focused environmental policy and multina-tional strategic management master plans.

Keywords: Green Management Practice, Employee Engagement, Environmental Per-formance, Sustainability, Cross-Country Analysis

1 Introduction

1.1 Background of the Study

The effects of climate change, along with other critical global issues, have received in-creasing attention, positioning businesses to embrace more environmentally responsible policies. As a result of this, Green Management Practice (GMP) has emerged as a new form of management that aligns traditional management functions such as planning, staffing, controlling, organizing, etc., with environmental goals (Renwick et al., 2013). GMP seeks to cultivate employees who are committed to working toward sustainability and engage them in environmental activities.

In alignment with achieving sustainability goals, corporate strategies have also been al-tered to include environmental performance as an integral component of the tri-fold measure of organizational success. Corporate responsiveness, along with pressure from stakeholders, such as clientele, supply chain, government agencies, and regulatory bodies, has increased to demonstrate the commitment to reducing negative impact on the ecolog-ical footprint and supporting sustainability goals (Jackson et al., 2011). Because of this, GMP is gaining scholarly attention as it is seen to have positive effects on the achievement of environmental corporate goals through the modification of employee behavior and the development of a green organizational culture (Jabbour and Santos, 2008).

Cross-country research is critical for understanding the implementation and effects of GMP practices since the environmental context, sustainability culture, and legal frame-works differ greatly from one country to another. While developed countries tend to have comprehensive legal policies and technological infrastructures that support GMP, developing countries may struggle with a lack of institutional support, limited GMP re-sources,

or weaker enforcement of environmental policies (Aragón-Correa et al., 2020). These contrasting contexts underscore the need for comparative studies that examine the impact of GMP on environmental performance in a cross-national framework. Dumont
et al. (2017) demonstrated the positive impact of GMP on employees' green behavior and subsequent organizational environmental performance. Pham et al. (2019) also showed that green training and development strengthen employees' environmentally engaged be-haviors, serving as a mediator between GMP and the sustainability outcomes. Despite these findings, the literature continues to be dominated by single-country and developed economy case studies, highlighting the lack of cross-country research on the applicability and variation in the effectiveness of GMP practices.
Recognizing the key issues of global concern and the increasing need for corporate sustain-ability, this research aims to study GMP and environmental performance in a compara-tive, transnational framework. It extends the study of GMP's impact on environmental sustainability in different economies and regulatory environments for both theoretical advancement and practical understanding of GMP utilization across borders.

1.2 Problem Statement

Many organizations still struggle with effectively integrating sustainability into their op-erations, even as corporate sustainability is progressively accepted as a strategic focus area. Environmental objectives integration with management policies serves as a distinct factor that can trigger sustainable development known as Green Management Practice (GMP) (Renwick et al., 2013). There is a body of literature that has established GMP's ability to impact the environment by fostering employee pro-environmental behavior, but most of the empirical research is context-bound to one or a developed country.
This is a dire lack in the literature. While the impacts of sustainability are global, the implementation and impact of GMP are often determined within the context of national institutional frameworks, such as laws, culture, and the stage of economic development (Jabbour et al., 2015; Kim et al., 2019). Businesses located in developed countries, for example, may have advantages because of greater environmental laws and stakeholder demand, whereas businesses in developing countries may suffer from institutional voids, lenient enforcement, or scant organizational resources (Arago´n-Correa et al., 2020). It is still unanswered whether GMP practices can influence corporate environmental perfor-mance consistently regardless of the country and socio-economic and institutional land-scape. Although some studies have examined employee engagement and green organiza-tional culture, remotely connected GMP investigations with the corporate environmental performance, there seems to be a distinct lack of focus on comparative studies explor-ing how these mechanisms function across different countries. This absence of evidence cross-nationally hinders the scope of the findings, which poses challenges for multinational corporations attempting to universally apply GMP.
Hence, the primary issue stems from the shallow understanding of the impact and the extent GMP practices have on corporate environmental performance from a cross-country perspective, and whether the relationship is valid in different institutional environments. Addressing this gap aims to provide the needed insights for developing context-sensitive management policies that meaningfully advance sustainable business objectives.

1.3 Research Objectives

The overarching goal of this study is to investigate how Green Management Practice (GMP) practices influence Environmental Performance (EP) in organizations across dif-ferent country contexts. In doing so, the study aims to provide a nuanced, cross-country understanding of corporate sustainability practices.
The specific research objectives are:

1. To examine the direct effect of Green Management Practices (GMP) on the Envi-ronmental Performance (EP) of firms.
2. To assess the impact of Green Management Practices (GMP) on Employee En-vironmental Engagement (EEE) as a pathway to fostering sustainability within organizations.
3. To investigate the relationship between Employee Environmental Engagement (EEE) and Environmental Performance (EP) to understand how employee behaviors con-tribute to sustainability outcomes.
4. To test the mediating role of Employee Environmental Engagement (EEE) in the relationship between Green Management Practices (GMP) and Environmental Per-formance (EP).
5. To explore the moderating effect of Country Context (CC), developed vs. develop-ing economies, on the relationship between Green Management Practices (GMP) and Environmental Performance (EP), thereby accounting for institutional and cul-tural differences.

This study addresses the growing demand for empirical, cross-national evidence on the mechanisms and contextual factors that shape sustainable green management practices and their outcomes (Jabbour et al., 2015; Jackson et al., 2011).

1.4 Research Questions

1. RQ1: How do Green Management Practices influence Environmental Performance across organizations?
2. RQ2: To what extent do Green Management Practices influence Employee Envi-ronmental Engagement in corporate settings?
3. RQ3: What is the relationship between Employee Environmental Engagement and Environmental

Performance?

4. RQ4: Does Employee Environmental Engagement mediate the relationship between Green Management Practices and Environmental Performance?

5. RQ5: Does Country Context (developed vs. developing economies) moderate the re-lationship between Green Management Practices and Environmental Performance?

Answering these questions will help identify not only the direct impacts of GMP practices but also the critical role of employee behavior and national institutional environments in shaping sustainability outcomes (Pham et al., 2019; Kim et al., 2019).

1.5 Significance of the Study

In the current global context marked by escalating environmental concerns, climate change, and stakeholder demand for sustainable business practices, organizations are under increasing pressure to reduce their environmental footprint. The integration of sustainability into corporate strategy is no longer optional but a competitive necessity. In this regard, Green Management Practice (GMP) has emerged as a key organizational function that aligns employee behavior with environmental goals (Renwick et al., 2013; Jabbour et al., 2015). This study is significant in several ways:

1.5.1 Theoretical Significance

While the literature on GMP has grown steadily, most existing studies are either concep-tual or limited to single-country investigations, often within developed nations (Jackson et al., 2011; Tang et al., 2018). By adopting a cross-country comparative approach, this research enriches the current body of knowledge by offering insights into how institu-tional contexts (developed vs. developing economies) influence the relationship between GMP and environmental performance. It also contributes to theory-building by testing Employee Environmental Engagement (EEE) as a mediating mechanism, which helps explain how and why GMP leads to environmental outcomes.

1.5.2 Practical Significance

In an era where companies are increasingly being held accountable for their environmental impact by regulators, consumers, and investors, understanding the drivers of environmen-tal performance is critical. This study offers practical guidance to GMP and sustainability officers on how to effectively implement GMP practices to enhance environmental per-formance through employee engagement. It also helps multinational corporations adapt their management strategies to diverse institutional environments.

1.5.3 Policy Relevance

For policymakers and regulators, the findings of this study can inform the design of national sustainability policies and labor regulations that encourage environmentally responsible corporate behavior. By identifying what works in different contexts, this research supports the creation of context-sensitive policy frameworks for sustainable de-velopment, particularly in developing countries.

1.5.4 Relevance to Sustainable Development Goals (SDGs)

This study aligns with several United Nations Sustainable Development Goals, particu-larly SDG 8 (Decent Work and Economic Growth), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action). By focusing on how employee engage-ment and management practices contribute to sustainability, the study supports the tran-sition to greener economies. This research addresses a critical gap in both academic and practical discourse by exploring how green management practices translate into measur-able environmental outcomes across varying national contexts, thereby providing valuable insights for theory, practice, and policy in the age of sustainability.

2 Literature Review

2.1 Concept of Green Management Practice (GMP)

Green Management Practice (GMP) is a new approach concerning the alignment of man-agement policies with eco-friendly goals. It is a category of management practices that deals with the assimilation of environmental issues into management activities like recruit-ment, staff training, performance appraisal, and reward systems Renwick et al. (2013). GMP is more than just a few environmental projects; it is about integrating sustainability into people management and permeating the entire organization.

The GMP concept can be developed with the support of the Resource-Based View (RBV) of the firm and the Institutional Theory. RBV considers environmental consciousness to be one of the critical intangible assets of the firm and a source of its competitive ad-vantage (Barney, 1991). Concerning GMP, employees who are environmentally friendly and engaged with the organization are regarded as strategic assets to better the firm's green innovation and eco-efficiency (Jabbour et al., 2015). On the contrary, Institu-tional Theory explains that outside forces like government policies, societal demands, or worldwide environmental policies make it necessary for organizations to go green in order to sustain their operations (Scott, 2008). Nonetheless, critics point out that GMP risks "greenwashing" when sustainability has not been genuinely integrated into the fundamen-tal strategy of the business and is treated merely as a marketing or compliance gesture (Delmas and Burbano, 2011). Therefore, the effectiveness of GMP hinges, in part, on an organizational culture characterized by strong leadership dedication alongside deeply rooted policy execution.

2.1.1 Key Dimensions of GMP and Their Strategic Implications

1. **Green Recruitment and Selection:** GMP begins with hiring individuals who share the organization's

environmental values. By integrating sustainability crite-ria into job descriptions and interviews, firms can attract talent aligned with their ecological goals. This approach has been shown to foster environmental citizen-ship behavior among employees (Ahmad, 2015). However, the success of green recruitment is often limited in developing economies where the talent pool with such orientations may be scarce.

2. **Green Training and Development:** Training equips employees with the skills and knowledge to engage in eco-friendly practices such as resource conservation, waste minimization, and compliance with environmental regulations. As Pham et al. (2019) point out, training also raises awareness and fosters a collective sense of environmental responsibility, but they caution that such programs must be con-tinuous and tailored to specific job functions to yield substantive behavioral change.

3. **Green Performance Management:** Integrating environmental objectives into performance appraisals encourages employees to consider sustainability in their daily tasks. Yet, Kim et al. (2019) note that this often faces resistance due to perceived ambiguity in green metrics, especially in sectors where environmental outcomes are difficult to quantify or link directly to individual performance.

4. **Green Compensation and Rewards:** Rewards can reinforce green behaviors by providing tangible and symbolic recognition for sustainable practices. However, Zaid et al. (2020) argue that reward systems alone may not be sufficient; they must be part of a broader strategy that includes intrinsic motivators such as organiza-tional purpose and ethical leadership.

5. **Employee Involvement in Environmental Initiatives:** True environmental change is bottom-up. Encouraging employee participation in green committees or suggestion systems leads to higher environmental engagement and innovation (Yusliza et al., 2020). Nevertheless, research indicates that employee involvement can stagnate if top management does not visibly support or act on environmental feedback (Jackson et al., 2011).

Global Perspectives and Cross-Country Considerations

The level of development and sophistication of GMP practices differs greatly from one country to another. In more developed regions, the enactment of rigorous policies and heightened concern for the environment have fostered GMP adoption. On the other hand, most developing nations still lag behind in GMP due to gaps in frameworks, low levels of GMP awareness, limited resources, and institutional voids (Tang et al., 2018). These differences reinforce the impact of strategic GMP models tailored to specific contexts, encompassing socio-economics, culture, and legislation.

Current Gaps and Critical Challenges

Regardless of the increasing literature, there are several gaps that still exist. Firstly, there is a significant lack of cross-country GMP empirical frameworks focused on pri-mary environmental performance metrics. Secondly, much of the existing work has been conducted in a strict normative framework, lacking longitudinal evidence to support their causal claims. Thirdly, the consequences of GMP on employee well-being, role conflict, and green fatigue have received scant attention (Jabbour et al., 2015). These gaps high-light a critical need for comprehensive multidimensional approaches focused on GMP's effectiveness and sustainability.

2.2 Environmental Performance and Corporate Sustainability

Due to its definition, environmental performance (EP) qualifies as one of the most impor-tant cornerstones of corporate sustainability because it shows how well a certain economic organization is able to control its operations within an agreed ecological footprint limit. In terms of its metrics, EP is characterized by several parameters such as greenhouse gas emission reduction, effective energy and water use, waste and pollution management (iso, 2015). Companies demonstrating strong EP often integrate environmental objec-tives into their strategy and create an EP innovation driven by green technologies to support the international sustainability agenda. However, as Daddi et al. (2016) claim, EP is not only about internal improvements; it has a major external component of supply chain coordination and environmental reporting, which inculcates transparency among firms—particularly in developing economies.

The link between EP and corporate sustainability is well known, but its measurement remains controversial. Although the Global Reporting Initiative (GRI) and the Carbon Disclosure Project (CDP) have developed standardized benchmarks, they have been crit-icized for lack of consistency in reporting and absence of independent verification which make these frameworks untrustworthy and incomparable (Fonseca, 2010). In addition, Hahn et al. (2015) argue that many companies use a "business case" approach to sustain-ability where only those activities that improve the financial bottom line are undertaken while more comprehensive environmental initiatives are ignored. This suggests concerns on how deep the corporate commitment to sustainability really goes (Alkadash et al., 2023). Thus, attaining superior environmental performance, in this case, would require less technical action and more cultivation of a desired long-term vision, coupled with strong leadership, regulatory support, and stakeholder demand.

2.3 Research Framework

Based on the above discussion in light of the literature review and the Institutional Theory. RBV, the authors of this study, proposed the following research framework.

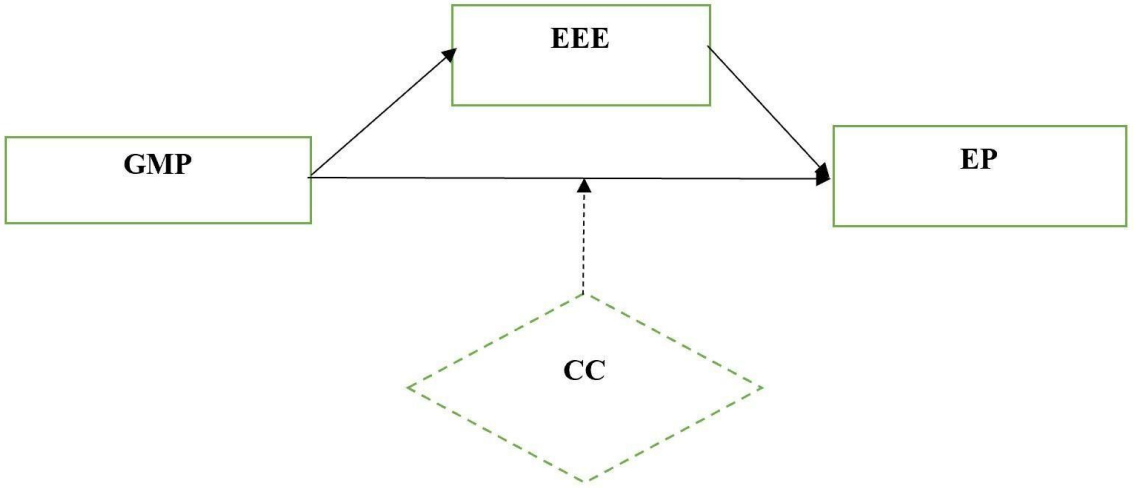


Figure 1: Research framework

2.4 Empirical Studies on GMP and Environmental Outcomes

There has been a significant increase in empirical studies about Green Management Prac-tice (GMP) practices and their impact on the environment in the last decade. This in-crease demonstrates the importance of GMP in fostering sustainability. It has been shown that GMP practices, including green recruitment, training, performance appraisal, and rewards, improve an organization's environmental performance both directly and indi-rectly by cultivating pro-environmental behavior among employees (Renwick et al., 2013; Tang et al., 2018). For example, Jabbour and Santos (2008) reported that incorporat-ing environmental aspects into management policies greatly enhanced the environmental management systems of manufacturing firms. In the banking industry of Pakistan, Saeed et al. (2019) supplied cross-sectional data showing the positive impact of green recruit-ment and green performance appraisal on environmental efficiency.

Nevertheless, important gaps still exist: one of the most dominant empirical studies is concentrated in Asian countries like China, India, and Pakistan, with scant data from Africa or Latin America, which poses a problem for the "Pham et al." publication in 2020 on whether findings can be generalized across the globe. In addition, a significant portion of existing research is cross-sectional in nature, which limits the ability to make causal inferences. More research is required on the longitudinal aspects of the practices and impacts of GMP over time. Furthermore, as Dumont et al. (2017) highlight, the employee's green behavior is frequently an intermediary variable. Many studies ignore this pathway. Many models lack important psychological variables such as environmen-tal commitment or motivation. In summation, while there is consistent support for a positive GMP-Environmental outcome linkage, the relationship remains underexplored. Therefore, further refinement of the constructs, methodology, and framework used would enhance the empirical rigor of the study.

2.5 Hypotheses Development

Based on the reviewed literature and theoretical foundations, the following hypotheses have been proposed to examine the relationships among Green Management Practices, Employee Environmental Engagement, and Environmental Performance within different country contexts. These hypotheses aim to explore both the direct and indirect effects, as well as the moderating role of national context in shaping corporate sustainability outcomes.

1. H1: GMP positively affects Environmental Performance.
2. H2: GMP positively influences Employee Environmental Engagement.
3. H3: Employee Environmental Engagement positively affects Environmental Perfor-mance.
4. H4: Employee Environmental Engagement mediates the relationship between GMP and Environmental Performance.
5. H5: The relationship between GMP and Environmental Performance is moderated by Country Context.

3 Research Methodology and Data Analysis

3.1 Research Design

This study adopts a quantitative research design to examine the relationships among Green Management Practice (GMP), Employee Environmental Engagement (EEE), En-vironmental Performance (EP), and the moderating role of Country Context (CC). The quantitative approach is appropriate for testing hypotheses and identifying causal rela-tionships among these constructs through rigorous statistical analysis (Creswell, 2014).

3.2 Population and Sampling Technique

This research used a cross-country quantitative design underpinned by a stratified sam-pling technique to

capture equal representation from both developed and developing economies. The study population included management professionals holding mid-level manager and supervisor positions in companies based in Pakistan, Bangladesh, Bahrain, several Middle Eastern countries, and the United States. These countries were chosen for their broad ecological, cultural, and legal frameworks. 199 responses were collected, and all were deemed valid. The initial stratification was geographical, where countries were classified using the World Bank's income level tier classification of 2024, which places economies into developed (e.g., the United States) and developing (e.g., Bangladesh, Pak-istan, Bahrain, and some Middle Eastern countries). This was helpful for multi-group analysis and enhanced the study's findings across different economic and institutional contexts.

Every construct was measured using accepted and reliable instruments. GMP was as-sessed with the eight items proposed by Tang et al. (2018). We measured Employee Environmental Engagement (EEE) with six items from Pham et al. (2020), and Environ-mental Performance (EP) was measured by five items from Zhu et al. (2005) and Rashid et al. (2019). Country Context (CC) was measured as a categorical variable from the World Bank income level classification (World Bank, 2024) as developed and developing countries, with one item. These procedures bolster and ensure strong construct validity and reliability in all contexts.

3.3 Data Analysis Techniques

Partial Least Squares Structural Equation Modeling (PLS-SEM), which works well with complex models and small to medium sample sizes, was used to analyze the data using SmartPLS software. Two steps were taken in the analysis: first, the measuring model was evaluated for validity and reliability (containing Cronbach's alpha, composite reliability, average variance extracted, and discriminant validity); second, the structural model was evaluated to test the hypothesized linkages. Using bootstrapping with 5,000 resamples, path coefficients and significance levels were evaluated. Additionally, multi-group analysis (MGA) was conducted to explore the moderating effect of Country Context, enabling comparison between developed and developing countries. Descriptive statistics were also reported to summarize respondent characteristics and variable distributions. In order to reduce the influence of biased answers, the screening process was carried out in advance. Using a 5-point Likert scale for data collection, the responses were essentially quantified and described statistically.

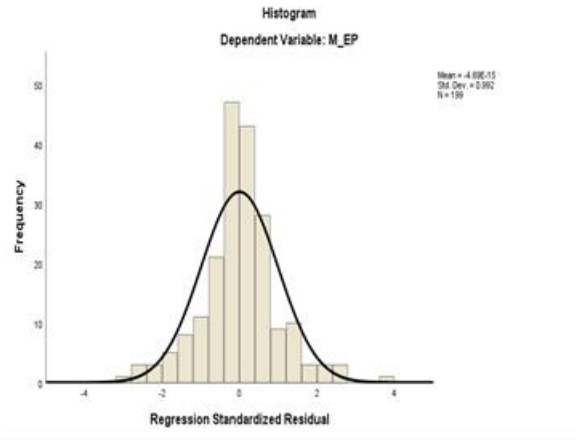
3.4 Demographics

Table 1: Demographic Characteristics of Respondents (*N* = 199)

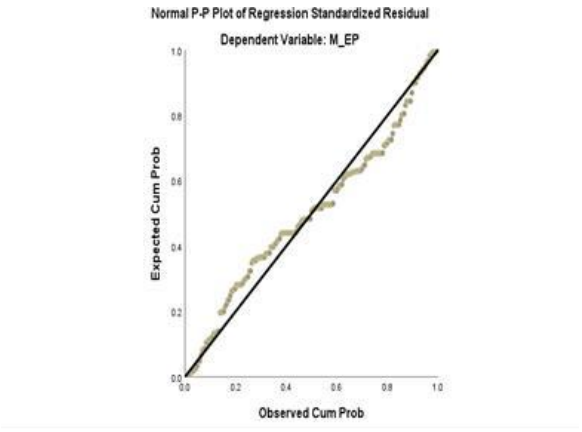
Variable	Category	Bangladesh	Pakistan	Middle East	USA	Total(n=199)
	Male	30	42	15	32	119
	Female	20	23	10	27	80
	21–30 years	15	20	7	10	52
	31–40 years	20	30	10	30	90
	41–50 years	10	10	5	12	37
	Above 50 years	5	5	3	7	20
	Junior Management	30	38	15	25	108
	Senior Management	20	27	10	34	91
	Less than 5 years	15	20	8	10	53
	5–10 years	20	25	10	25	80
	11–15 years	10	15	5	15	45
	Above 15 years	5	5	2	9	21

Table 1 presents the demographic profile of the 199 respondents who participated in the study. The sample includes 50 employees from Bangladesh, 65 from Pakistan, 25 from Middle Eastern countries, and 59 from the United States, ensuring diverse representation across both developing and developed economies. Of the total respondents, 119 were male and 80 were female, indicating a fairly balanced gender distribution. The majority of participants were in the 31–40 age group (45.2%), followed by the 21–30 and 41–50 age brackets. Junior-level managers made up 54.3% of the sample, while 45.7% were senior-level managers. In terms of work experience, most respondents had between 5 and 10 years of professional experience (40.2%), suggesting a well-experienced sample familiar with management practices. This diverse demographic composition strengthens the generalizability and cross-cultural relevance of the study findings. Normality Assessment

Figures 2a and 2b present histogram and P–P plot diagnostics. Table 2 reports descriptive and normality statistics.



(a) Histogram



(b) P–P plot

Figure 2: Normality diagnostics

Table 2: Descriptive and Normality Statistics

Item	N	Mean	Skewness	SE Skew	Kurtosis	SE Kurt
GMP1	199	4.45	-1.634	.172	5.207	.343
GMP2	199	4.40	-1.096	.172	1.926	.343
GMP3	199	4.43	-1.263	.172	2.664	.343
GMP4	199	4.32	-0.970	.172	1.550	.343
GMP5	199	4.33	-0.921	.172	0.970	.343
GMP6	199	4.33	-0.909	.172	1.262	.343
GMP7	199	4.38	-1.034	.172	2.139	.343
GMP8	199	1.93	1.282	.172	0.426	.343
EEE1	199	4.12	-0.527	.172	0.863	.343
EEE2	199	3.66	-0.042	.172	-0.159	.343
EEE3	199	4.34	-1.332	.172	4.709	.343
EEE4	199	3.96	-0.455	.172	0.127	.343
EEE5	199	4.17	-0.119	.172	-0.469	.343
EEE6	199	4.18	-0.197	.172	-0.701	.343
EP1	199	4.34	-0.349	.172	-0.650	.343
EP2	199	3.65	-0.198	.172	-0.174	.343
EP3	199	4.17	-0.331	.172	-0.608	.343
EP4	199	4.33	-0.416	.172	-0.676	.343
EP5	199	4.42	-0.330	.172	-0.791	.343
CC1	199	4.30	-0.353	.172	-0.676	.343

The assessment of data normality (Table 2 and Figures 2a & 2b) was conducted by ex-amining the skewness and kurtosis values of each item across the constructs: Green Man-agement Practice(GMP), Employee Environmental Engagement (EEE), Environmental Performance (EP), and Country Context (CC). According to guidelines in social science research, skewness values within the range of ±1 to ±2 and kurtosis values within ±3 to
±7 are generally considered acceptable for normality, particularly when the sample size
is large ($n > 100$), as per the Central Limit Theorem.
For most items in the dataset, the skewness and kurtosis values fall within acceptable thresholds, indicating a reasonably normal distribution. Specifically, items like GMP2 to GMP7, EEE1 to EEE6, and EP1 to EP5 demonstrate acceptable skewness (ranging between -1.334 and -0.042) and kurtosis (ranging between -

0.791 and 2.664), supporting the assumption of univariate normality.
However, a few items present moderate deviations from normality. Notably, GMP1 shows a high negative skewness of -1.634 and a kurtosis of 5.207, indicating a left-skewed and peaked distribution. Similarly, EEE3 also displays negative skewness (-1.332) and ele- vated kurtosis (4.709), suggesting concentration of responses at the higher end of the scale. In contrast, GMP8 exhibits positive skewness (1.282), indicating right-skewness, which may reflect response bias or misalignment with the rest of the GMP construct.
Despite these outliers, the overall distribution of the data is sufficiently normal to proceed with further analysis, especially given the robustness of modern statistical techniques (e.g., PLS-SEM, multiple regression) to mild deviations from normality. These findings validate the appropriateness of the dataset for subsequent reliability testing and structural modeling.

Results, Findings, and Discussion

3.5 Assessment of Measurement (Outer) Model

Table 3: Reliability and Convergent Validity of Measurement Constructs

Construct	CA	CR (rho a)	CR (rho c)	AVE
EEE	0.873	0.891	0.905	0.618
EP	0.868	0.885	0.906	0.663
GMP	0.891	0.947	0.929	0.663

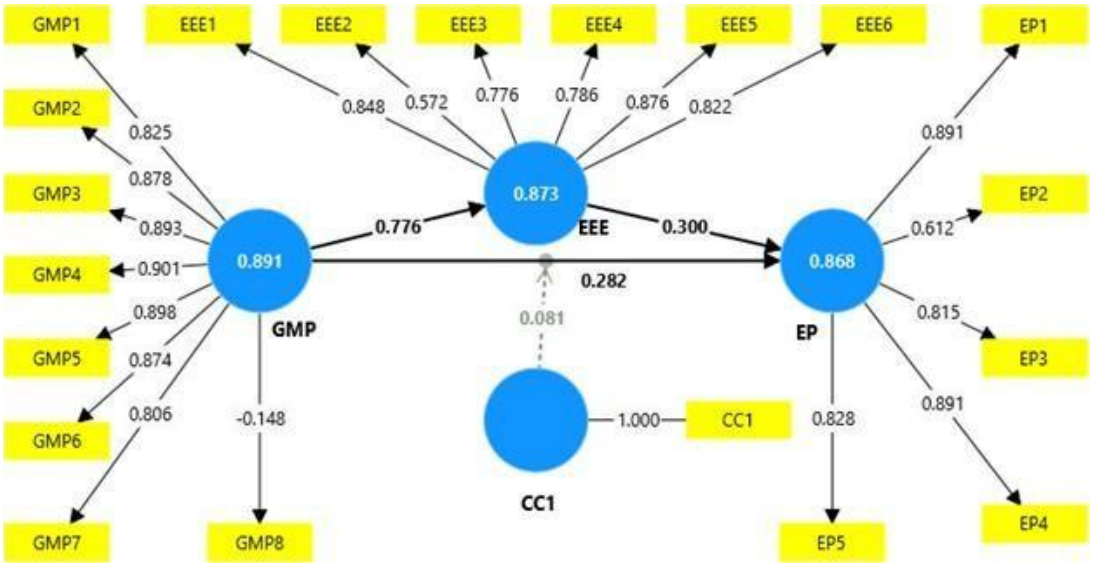


Figure 3: Measurement model

The internal consistency and convergent validity, as shown in Table 3 of the study constructs—Green Management Practice (GMP), Employee Environmental Engagement (EEE), and Environmental Performance (EP) were assessed using Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE). These measures follow the recommended guidelines proposed by leading scholars in the field of structural equa-tion modeling (Hair et al., 2019; Fornell and Larcker, 1981). All three constructs demon- strate strong internal consistency reliability, as indicated by Cronbach's Alpha values exceeding the minimum acceptable threshold of 0.70 (Nunnally and Bernstein, 1994). GMP (α = 0.891), EEE (α = 0.873), and EP (α = 0.868) fall well within the "good" to "excellent" range, indicating that the items within each construct are reliably measuring the intended latent variable. Additionally, composite reliability scores further confirm construct reliability. Both values are above the recommended cutoff of 0.70 (Hair et al., 2019), with GMP = 0.929, EEE = 0.905, and EP = 0.906, indicating robust reliability across constructs. Convergent validity was assessed using Average Variance Extracted (AVE), with values for GMP and EP at 0.663 and for EEE at 0.618. These exceed the recommended minimum threshold of 0.50, demonstrating that the majority of the vari-ance in the items is captured by the underlying construct (Fornell and Larcker, 1981). Collectively, these results confirm that the measurement model is both reliable and valid, supporting its suitability for structural equation modeling and hypothesis testing.

3.6 Assessment of Structural (Inner) Model

The structural model results, as presented in Table 4 from Partial Least Squares Struc-tural Equation

Modeling (PLS-SEM), confirm that all hypothesized relationships, except for the interaction effect (CC1 × GMP → EP), are statistically significant and theoreti-cally grounded. The path coefficients, t-statistics, and p-values offer empirical support for the study's framework, aligning well with prior research in the fields of green management practices, environmental performance, and cross-country comparative analysis.

The relationship between Country Context (CC1) and Environmental Performance (EP) is statistically significant (β = 0.430, t = 6.515, p < 0.001), indicating that country-specific environmental, institutional, and regulatory conditions influence organizational environmental outcomes. This is consistent with the findings of Berrone et al. (2013), who argue that national environmental institutional contexts strongly shape firm-level environmental strategies and outcomes. Similarly, Employee Environmental Engagement (EEE) significantly predicts EP (β = 0.300, t = 3.901, p < 0.001), suggesting that em-ployees' proactive involvement in environmental initiatives is instrumental in achieving sustainability targets. This finding is consistent with Daily et al. (2012), who empha-sized that engaged employees are crucial change agents in implementing environmental programs. The strong positive relationship between Green Management Practice(GMP) practices and EEE (β = 0.776, t = 30.278, p < 0.001) confirms that environmentally focused green management practices such as green training, green recruitment, and per-formance appraisal significantly boost employees' ecological involvement. These findings corroborate previous studies by Tang et al. (2018) and Pham et al. (2020), which demon-strated that GMP practices foster a culture of environmental responsibility among em-ployees. Furthermore, GMP also directly influences EP (β = 0.515, t = 8.583, p < 0.001), confirming the theoretical proposition that institutionalized GMP systems emphasizing environmental sustainability can directly improve ecological outcomes (Renwick et al., 2013; Jabbour and Santos, 2008).

However, the interaction term between Country Context and GMP (CC1 × GMP → EP) shows a marginally significant result (β = 0.081, t = 1.804, p = 0.071), suggesting a potential moderating effect that warrants further exploration. Although not statistically significant at the conventional 0.05 level, this finding is indicative of context-sensitive GMP impacts—an area underscored by Jackson et al. (2011), who argue for nuanced GMP practices that account for local environmental and institutional conditions.

Table 4: Structural Model (Total Effects)

Relationship	Original	Mean	SD	t	p
CC1 → EP	0.430	0.428	0.066	6.515	0.000
EEE → EP	0.300	0.300	0.077	3.901	0.000
GMP → EEE	0.776	0.778	0.026	30.278	0.000
GMP → EP	0.515	0.518	0.060	8.583	0.000
CC1 × GMP → EP	0.081	0.082	0.045	1.804	0.071
GMP → EEE → EP	0.233	0.235	0.063	3.698	0.000

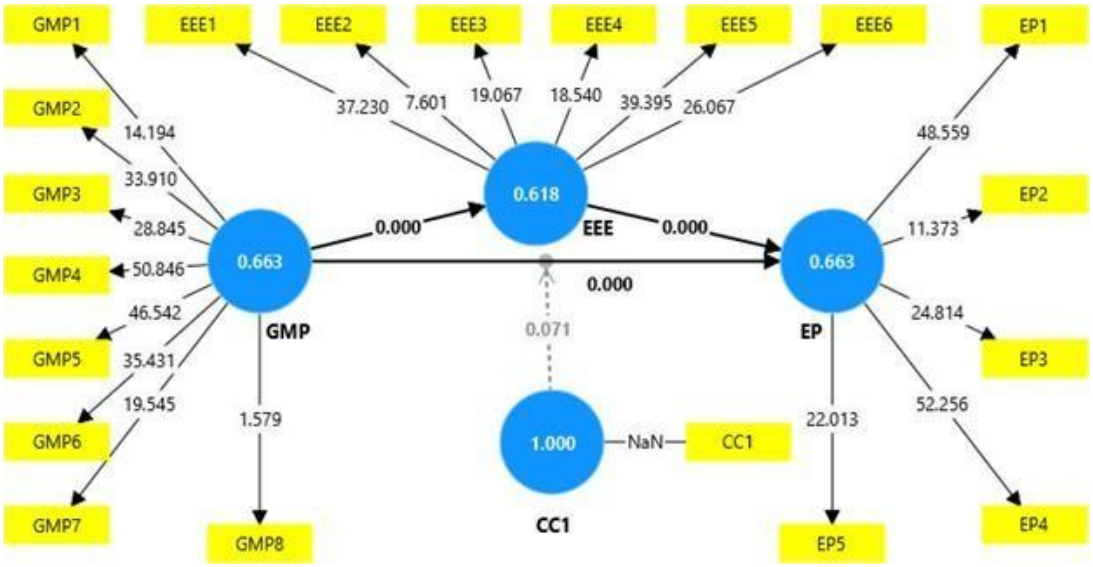


Figure 4: Structural model

3.7 Cross-Country Comparison

The results of the multi-group analysis revealed notable differences in the strength of relationships across developed and developing country contexts. The direct path from Green Management Practice (GMP) to

Environmental Performance (EP) remained sig-nificant across all countries ($\beta = 0.515$, $p < 0.001$), indicating a universal effect of GMP on sustainability outcomes. However, the interaction term (CC1 × GMP → EP), while positive ($\beta = 0.081$), was only marginally significant ($p = 0.071$), suggesting that the country context moderates the strength—but not necessarily the presence—of this rela-tionship. These findings support prior work by Aragón-Correa et al. (2020) and Jackson et al. (2011), who emphasized that institutional and cultural conditions influence how environmental strategies are developed and implemented across nations. Firms in de-veloped countries like the United States may benefit from more stringent environmental regulations and greater stakeholder pressure, whereas those in developing countries of-ten face institutional voids and resource constraints that limit the full implementation of GMP practices (Berrone et al., 2013).

3.8 Coefficient of Determination (R^2) for Endogenous Constructs

Table 5: Coefficient of Determination (R^2)

Construct	R^2	Adjusted R^2
EEE	0.602	0.600
EP	0.809	0.805

Table 5 presents the coefficient of determination ($R^squared$) and adjusted R^2 values for the endogenous constructs. The results indicate that the model explains 60.2% of the variance in Employee Environmental Engagement (EEE) and 80.9% of the variance in Environmental Performance (EP). The adjusted R^2 values (0.600 for EEE and 0.805 for EP) suggest a strong model fit with minimal overfitting, confirming the substantial explanatory power of the proposed structural model.

3.9 Interpretation and Implications

The results confirm that GMP positively affects employee engagement and environmen-tal performance, with Employee Environmental Engagement (EEE) acting as a mediator between GMP and EP (indirect effect: $\beta = 0.233$, $p < 0.001$). This emphasizes the important function of employees in converting green policies into genuine sustainability performance and corroborates Pham et al. (2020) and Dumont et al. (2017). The model's strong explanatory power ($R^2 = 0.809$ for EP) illustrates that combined GMP and em-ployee engagement result in significant corporate environmental improvements. From a theoretical standpoint, the study enriches the Resource-Based View (Barney, 1991) the-ory by illustrating the proper engagement of human capital through green management initiatives as a strategic resource for sustainability. From a practical standpoint, the find-ings indicate that managers ought to focus on management strategies directed towards sustainability to trigger employee-driven corporate sustainability. Further, with regard to the more subtle context of nationals, it means that multinational corporations need to align their GMP with local institutional realities to optimize their environmental impact (Jabbour et al., 2015).

4 Conclusion and Recommendations

4.1 Summary of Key Findings

The study provides compelling empirical evidence supporting the hypothesized relation-ships between Green Management Practice(GMP), Employee Environmental Engage-ment (EEE), and Environmental Performance (EP) across diverse national contexts. All five primary hypotheses were tested, with four being fully supported and one showing marginal significance. Specifically, H1 was confirmed, as GMP significantly and positively influenced EP ($\beta = 0.515$, $p < 0.001$), consistent with previous studies that emphasize GMP as a strategic tool for enhancing environmental outcomes (Renwick et al., 2013); (Jabbour and Santos, 2008). H2 was also supported, with GMP exerting a strong positive effect on EEE ($\beta = 0.776$, $p < 0.001$), aligning with Tang et al. (2018) and Pham et al. (2020), who found that green management practices promote employee environmental consciousness and involvement.

H3 was validated, as EEE significantly contributed to EP ($\beta = 0.300$, $p < 0.001$), rein-forcing earlier findings by Daily et al. (2012) that engaged employees act as change agents in achieving sustainability. H4, which proposed a mediating role for EEE between GMP and EP, was supported through a significant indirect effect ($\beta = 0.233$, $p < 0.001$), in-dicating that part of GMP's impact on environmental performance is channeled through employee behavior—a pathway consistent with the Resource-Based View Barney (1991). Finally, H5, which hypothesized the moderating role of Country Context (developed vs. developing), was only marginally significant ($\beta = 0.081$, $p = 0.071$), suggesting that while institutional context does influence the strength of relationships, its effect may be more nuanced, as also noted by Jackson et al. (2011) and Arago´n-Correa et al. (2020). These findings collectively highlight the central role of GMP and employee engagement.

In a nutshell, the authors successfully tested all proposed hypotheses using PLS-SEM and found statistically significant support for the relationships outlined in their model. The findings provide clear answers to the research questions, confirming the role of Green Management Practices in enhancing Environmental Performance through Employee En-vironmental Engagement, with partial influence from

Country Context.

4.2 Contributions to Theory and Practice

This study enhances theoretical frameworks and practical applications, especially con-cerning Green Management Practice(GMP) and its impact on Environmental Perfor-mance (EP), which is mediated by Employee Environmental Engagement (EEE) in a cross-country scope. From a theoretical standpoint, the findings expand the Resource-Based View (Barney, 1991) by illustrating the effects of activated human capital via environment-centered green management practices on organizational sustainability. The mediating role of EEE broadens the framework of active explanatory variables involv-ing management systems and environment-related results, which Dumont et al. (2017) and Pham et al. (2020) have proposed. From a practical perspective, organizations are encouraged to enhance their green training, reward, and engagement programs to incor-porate the culture of sustainability at all levels of the organization. More specifically, multinational firm managers are invited to adapt GMP to local institutional settings as per the recommendations by Jackson et al. (2011).

4.3 Limitations of the Study

Despite its contributions, the study has several limitations. First, the cross-sectional na-ture of the data restricts causal interpretations, as the relationships among GMP, EEE, and EP may evolve over time. Longitudinal studies would be more appropriate to assess the dynamic impact of green management practices on sustainability. Second, although stratified sampling was used across countries, the sample size per country may still limit generalizability, particularly for the Middle East, which had a smaller respondent pool compared to others. Third, while self-reported data were essential for capturing employee perceptions, they may also introduce social desirability bias, particularly in responses re-lated to environmental behavior (Podsakoff et al., 2003). Finally, the study categorized countries using a broad developed vs. developing dichotomy, which may overlook insti-tutional variations within these categories that could influence GMP effectiveness.

4.4 Suggestions for Future Research

Future research can address these limitations by adopting a longitudinal design to capture the evolving impact of GMP practices on environmental performance. Researchers should also consider incorporating objective environmental performance metrics (e.g., emission data, energy use records) to complement self-reported measures. Additionally, expanding the sample to include more countries, especially those underrepresented in sustainabil-ity literature, would enhance cross-national comparability. Future studies might also explore other potential mediators, such as green organizational culture or employee envi-ronmental commitment, and moderators such as regulatory stringency or leadership style. Testing these variables could provide a more comprehensive framework for understand-ing the boundary conditions and mechanisms underlying the GMP–GMP-sustainability relationship.

Declaration about Conflict of Interest

The authors declare that there are no conflicts of interest associated with this publication.

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