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Unveiling the Pathway Toward Green Management Strategies to Green Building Success: The Mediating Role of Circular Economy Practices

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Abstract
The main objective of this research is to explore the role of green management strategies for achieving green building success through circular economic practice and the moderating effect of green economic incentives under the lens of Resource Base View theory. The analysis was done by using the structural equation modeling technique to evaluate and restrain the proposed model. A survey questionnaire was used to collect data from 384 respondents using a convenient sampling technique from the owner or top manager of the construction sector in Pakistan. In this regard, all the direct and indirect relationships are significant, and green management strategies significantly impact green building success through circular economic practices which include reduce, reuse, recycle, and recover. Furthermore, all the dimensions also have a significant moderating role in green economic incentives for green building success. In the context of this study, leaders and managers of the construction sector can effectively establish green strategies to gain success in green buildings. The management can be better facilitated to all stakeholders for circular economic practices that ultimately lead towards green building success. This study created an understanding of green economic incentives for the effectiveness of green buildings. Moreover, this research contributed to the literature review of green building success by using green management strategy and circular economic practices as strong influencers.
Keywords: Green management strategy, circular economic practices, green economic incentives, green building success

1. Introduction

In a competitive landscape, many environmental challenges are faced by organizations to survive (Miceli et al., 2021). Currently, the World is facing several environmental issues which include air pollution, water pollution, climate change, deforestation; biodiversity loss, and environmental degradation (Qi et al., 2020). Therefore, there is a need for comprehensive solutions to environmental challenges (Audi & Ali, 2020; Al-Shetwi, 2022). In this regard, for a sustainable future, it is essential to address environmental challenges through sustainable development and green building practices (Hafez et al., 2023). The sustainable material, energy efficient system, and harmonious designs are significant contributors to reducing unwanted material, promoting energy proficiency, and minimization of carbon emissions (Ma et al., 2023). The collaboration of governments, businesses, and communities played a vital role in protecting biodiversity, cultivating municipal well-being, and innovative building solutions through key building practices (Kiss et al., 2022; Wang & Manopimoke, 2023).

Green management strategies focused on developing green practices within the organization for environmental sustainability (Amjad et al., 2021). The utilization of sustainable practices and policies in the organization incorporated for reducing environmental impact, resource optimization, and improvement of green building performance (Chi et al., 2020). Green building initiatives highly require the adoption of green management strategies for the achievement of green success (Wen et al., 2020). Green management strategies helped to integrate ecological concerns in organization operations to reduce waste, continuous monitoring, resource efficiency, and pollution control (Rehman et al., 2021). The context of green building is multifaceted with the role of green management strategies (Franco et al., 2021). The green management strategies provided structural approaches that significantly adhere to environmental standards and regulations for operational efficiency and augmenting market reputation (Afum et al., 2020). Collaboration and better communication are fostered through green management strategies which are crucial for green building projects (Mustaffa et al., 2021). The green practices for green building success are developed by implementing innovative technologies, designs, and construction processes (Franco et al., 2021). The green management strategies also contributed to meeting the requirements of green building certifications (Wen et al., 2020). It also aligned operations with sustainability goals and objectives of organizations. Due to resource scarcity and climate change challenges, green management strategies helped to transition towards a sustainable economy and address environmental issues (Yang et al., 2023).

Therefore, circular economic practices fostered sustainable development and abilities to tackle the environmental challenges for green building success (Munaro et al., 2020). Every part of circular economic practices played distinguish role for sustainability within the organization. Reduce is an important element that helped to reduce waste and increase effectiveness in production process (Bait et al., 2020). Reuse increased ability to use sustainable material that can be used again in construction layout (Schützenhofer et al., 2022). Recycle enhance efficiency and reduce cost which waste material can be again use for green buildings (Sheth, 2016). Recover enabled the organization to extracting value from waste material, energy and compositing recovery (Xavier et al., 2023; Limjaroenrat & Ramanust, 2023).

The research of green building certification schemes has identified significant gaps that allowed for more investigation into green management strategies and green building success (Komurlu et al., 2024). However, there are many studies has have used strategic management strategies but ignored circular economy practices (Verleye et al., 2024). Several studies have suggested that circular economy practices are outcomes of strategic management strategies (Ma & Hao, 2024). This concept has not been studied before in the context of Pakistan.

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This methodology has also not been investigated by previous studies. There is a lack of quantitative research regarding ecological benefits in the case of green building success (Jaradat et al., 2024). Moreover, green building initiatives have a robust the significant impact on community well-being and wider adoption (Singh & Kumar, 2023Komurlu et al., 2024). While, some barriers have been identified for sustainable development which are essential to progress effective green management strategies to overcome social, economic, and technical challenges (Komurlu et al., 2024). The primary aim of this research is to investigate the role of green management strategies on green building success through circular economy practices and the moderating effect of green economic incentives.

1.1. Research Objectives

- To explore the role of green management strategies on green building success
- To investigate the mediating role of circular economy practices between green management strategies and green building success
- To explore the moderating role of green economic incentives between circular economy practices and green building success

1.2. Research Questions

- What is the relationship between green management strategies on green building success?
- Do circular economy practices have a mediate relationship between green management strategies and green building success?
- Does a green economic incentive moderate the relationship between circular economy practices and green building success?

2. Literature

2.1. Resource Base View Theory

The resource-based view theory was significantly developed by Jay Barney in 1991 (Barney, 2021). The key concepts of this theory are valuable resources, inimitable resources, rare resources, and non-substitutable resources (Purba et al., 2023). The resource-based view theory is considered a strategic management theory that explores the internal capability and unique resources that helped to gain success in the competitive landscape (Nayak et al., 2023). The RBV theory suggests that green management strategies not only help to meet with requirements of environmental and regularity standards but are also considered as strategic assets of an organization (Farrukh et al., 2022). The RBV theory emphasizes that circular economic practices are unique capabilities of organizations to achieve green building success (Farrukh et al., 2023; Saluy & Nuryanto, 2023). Green economic incentives are acknowledged as external resources that contribute value to effectiveness in the utilization of resources (Stojčić, 2021).

2.2. Empirical Review

2.2.1. Green Management Strategy and Circular Economy Practices

The Green management strategy meant that organizations adopt eco-friendly practices to reduce the negative impact of their operations on the environment (Usman et al., 2023). Green management strategies established green initiatives, process optimization, and sustainable product design (Awan et al., 2021). On the other hand, circular economy practices consist of various concepts which include reducing, reuse, recycle, and recover (Morseletto, 2020). Every concept has equal importance for creating sustainability in the organization. The main purpose of circular economy practices is to reduce resource consumption, create a sustainable value chain, and minimize unwanted materials (Ogunmakinde et al., 2022). In this regard, the green management strategy creates a positive impact on circular economy practices which help to reduce waste during the production process and lead towards a resilient business model (Tang et al., 2022). Green management practices led the circular economy practices within the organization which ultimately increased long-term sustainability and developed green organizational culture (Bertassini et al., 2021). Various studies have highlighted the significant impact of green management strategy on circular economy practices (Bertassini et al., 2021; Kwarteng et al., 2022). The green management strategies aligned the organizational process with legal environmental requirements by regularity bodies and mitigated risks that are associated with reserve scarceness and supply chain devastations (Hilend et al., 2023). The green economic strategies linked the organization with corporate social responsibility through increasing circular economy practices in the organization (Morea et al., 2021). Green management strategies provided proper guidelines for waste segregation and recycling programs that augmented waste reduction and quantifiable repossession (Bui et al., 2022).

H1: There is a significant relationship between Green management Strategy and Circular Economy Practices

2.2.2. Circular Economy Practices and Green Building Success

The circular economy practices promoted reduce, reuse, recycle, and recover of materials that helped for green building (Joensuu et al., 2020). Circular economy practices played a crucial role in green building success through minimizing carbon footprint and condensing resource ingestions (Chawla et al., 2022). Circular economy practices incorporated in the green building helped to achieve sustainability in the construction and production process (Dsilva et al., 2023). According to previous research, by implementing circular economy practices for green building, the organizations became able to utilize resources efficiently and cost saving in the production process (Giorgi et al., 2022). Both circular economy practices and green building are recognized as the most vital components for sustainable development. The main focus of circular economy practices is to maximize resources through promoting recycling and reusing of materials towards green building success (Munaro et al., 2020). The circular economy practices played an important role in reducing carbon emissions and waste, especially associated with new materials used in manufacturing procedures (Colorado et al., 2020). The construction industries have reduced the negative impact of unwanted material by expressively exploiting circular economy practices (Chizaryfard et al., 2021). The circular economy practices lead the organization towards waste management practices that increase the ability to become successful in green buildings (Shooshtarian et al., 2022). There is a synergic impact of circular economy practices of green building success that enhanced financial discernibility and reduced cost that is concomitant with material procurement and waste disposal (Thirumal et al., 2024). By

having green building success, the organization got easily sustainable competitive advantages and market competitiveness (Haseeb et al., 2019).

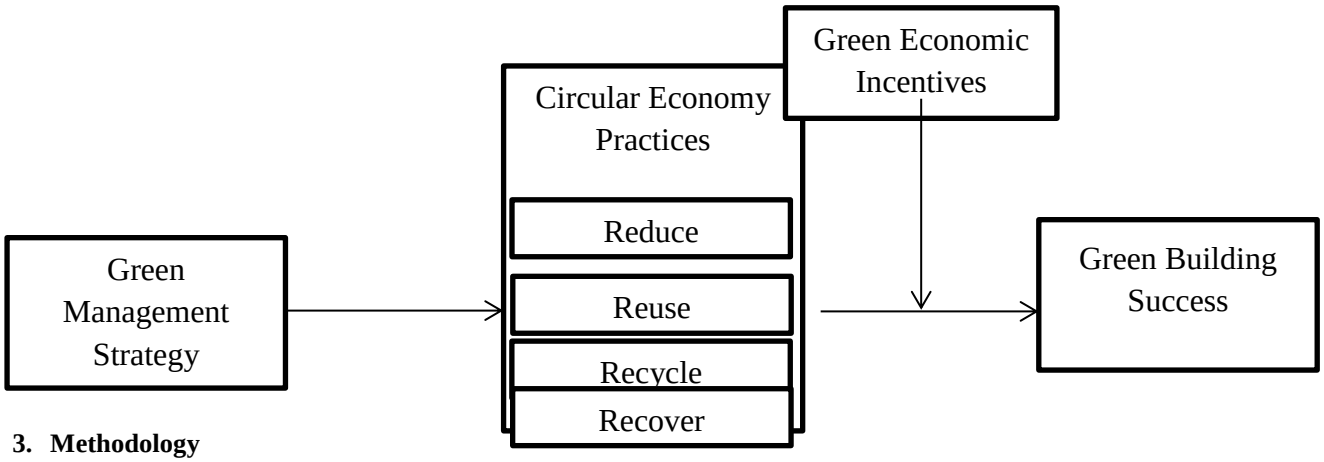
H2: There is a significant relationship between Green management Strategy and Circular Economy Practices

2.2.3. Moderating the role of green economic incentives

Green economic incentives consist of monetary or financial mechanisms to encourage organizations to adopt green practices for green building and implementing circular economy practices (Giorgi et al., 2022). There is a positive and significant impact of green economic incentives between circular economy practices and green building success (AlJaber et al., 2023). The green economic incentives have played a crucial role in enhancing the adoption of green practices, accelerating green building accomplishment, created synergic impact and behavioral influence to safeguard the interest of all stakeholders (Zhang & He, 2022). Green economic incentives derived innovation and sustainable practices within the organization that ultimately provided green building success (Circo, 2007). Several researches have highlighted that green economic incentives encourage circular economy practices, developed research & development, and supported taxation & regularity framework (D'amato & Korhonen, 2021).

H3: There is a significant moderating role of green economic incentives between circular economy practices and green building success.

Figure 1: Research Model



3. Methodology

3.1. Data Collection and Sample Size

This study used using quantitative research approach because data was collected through a survey questionnaire. The research approach is deductive. The target population is the construction sector of Pakistan. The main cities were targeted to collect data which include Lahore, Karachi, Faisalabad, and Gujranwala. The unit of analysis is organization. The sample size of this research is 384 according to Morgan. The data has been collected by using a convenient sampling technique. The questionnaire was distributed through email, WhatsApp, social media, and other means of communication.

3.2. Measurement of Variable

The main aim of this research is to explore the role of green management strategies in gaining green building success through circular economy practices and the moderating effect of green economic incentives. The green management strategy is an independent variable that has five items which are used by (Gunarathne et al., 2021), circular economy practices are a mediating variable that has four dimensions which include reduce by having three items used by (Nameghi & Shadi, 2013), reuse by having three items used by (Nameghi & Shadi, 2013), recycle by having three items used by (Nameghi & Shadi, 2013) recover by having four items used by (Wiguna & Iketut, 2019), green economic incentives is mediating variable that has two items used by (Sajid et al., 2022), green building success is a dependent variable that has six items used by (Elforgani et al., 2024).

Table 1: Measurement of Variable

Sr. No.	Variable Name	Items	Source
1	green management strategy	5	(Gunarathne et al., 2021)
2	Reduce	3	(Nameghi & Shadi, 2013)
3	Reuse	3	(Nameghi & Shadi, 2013)
4	Recycle	3	(Nameghi & Shadi, 2013)
5	Recover	4	(Wiguna & Iketut, 2019)
6	green economic incentives	2	(Sajid et al., 2022)
7	green building success	6	(Elforgani et al., 2024)

3.3. Common Bias Method

The common bias method (CBM) helped to ensure the accuracy, validity, and credibility of research findings. In this regard, the study randomly apportioned a questionnaire safeguarding the respondent's concealment and inconspicuousness by distinguishing dependent and independent constructs to control CBM. To evaluate the problem of CMB, the collinearity test has been completely exploited in structural equation modeling. After the analysis, the values of VIF are less than 3.3 which indicates that there is no impurity or problem of CBM in the projected model.

3.4. Profile of Respondent

The data were collected from the owner or project manager of the construction sector. The range of age was from 30 to 50 above. The educational background ranged from intermediation to PhD. The gender was male and female. The positions were owners and project managers. 33% of responses were from Lahore, 26% from Karachi, 22% from Faisalabad and 19% from Gujranwala.

4. Results

The hypotheses and theory have been tested by using Smart-PLS. Smart PLS considered as most significant tool that effectively deals with complex models, does not assume data normality, and has user user-friendly interface. Smart PLS improves predictive accuracy, and flexibility in model specification, and provides comprehensive results, visual representation, academic acceptance, and support for advanced analysis. The practical implications of Smart PLS explore the intermingled pathways and provide the accurate reliability and validity of the study's constructs. Another justification for preference is that normally distributed data is not required by PLS-SEM (Hair et al., 2021). Hence, it also helps to ignore problems of data normality in this research.

4.1. Convergent validity

The test of convergent validity provided the detail of correlation between items and contracts. After the analysis of the research hypotheses, the values of the average variant extracted, composite reliability, factor loadings, and Cronbach's alpha have been projected. The factors loadings mean that which observed the degree of correlation between research constructs and items. The factor loading values should be more than 0.30. The average variant extracted indicated that the construct explains more variance than error and the cut-off value is 0.50. The Composite Reliability confirms the internal consistency of constructs and items. The Composite Reliability value should be between 0.70 The Cronbach's Alpha value should be between 0.70 to 1 which supports the reliability of constructs. In this regard, according to Table 2, the factor loadings values are stretched from 0.469 to 0.966, composite reliability values are stretched from 0.827 to 0.96, AVE values are stretched from 0.653 to 0.923 and Cronbach's Alpha values stretched from 0.7 to 0.917. Due to the lowest factor loadings (<0.50), certain items were eliminated.

4.2. Discriminant validity

The discriminant validity demonstrated that which construct is truly distinct from other constructs. The Fornell-Larcker and Heterotrait-Monotrait Ratio are methods that are used to confirm the discriminant validity. The value of the HTMT ratio should be less than 0.90 otherwise above values might be measured as constructs that are not satisfactorily distinct. According to Table 3, all values of the HTMT ratio are less than 0.90 which indicates that the discriminant validity is existed. According to Table 2, all the values are in favor that directed convergent validity is established.

Table 2: Convergent Validity

Variable	Items	Loadings	Cronback's Alpha	CR	AVE
	GBS1	0.875	0.908	0.932	0.732
	GBS2	0.855			
Green Building Success	GBS3	0.859			
	GBS4	0.847			
	GBS5	0.841			
	GEI1	0.956	0.917	0.96	0.923
Green Economic Incentive	GEI2	0.966			
	GMS1	0.87	0.865	0.903	0.653
	GMS2	0.761			
	GMS3	0.71			
	GMS4	0.796			
Green Management Strategy	GMS5	0.89			
	REC1	0.859	0.865	0.908	0.712
	REC2	0.881			
	REC3	0.831			
Recycle	REC4	0.801			
	RECO1	0.941	0.908	0.942	0.845
	RECO2	0.888			
Recovery	RECO3	0.927			
	RED1	0.809	0.721	0.838	0.633
	RED2	0.756			
Reduce	RED3	0.82			
	REU1	0.899	0.7	0.827	0.631
	REU2	0.931			
Reuse	REU3	0.469			

Table 3: HTMT Ratio

	GBS	GEI	GSM	Rec	Reco	Red	Reu
GBS							
GEI	0.197						
GSM	0.683	0.194					
Rec	0.777	0.125	0.61				
Reco	0.677	0.161	0.567	0.544			
Red	0.177	0.441	0.266	0.159	0.092		
Reu	0.608	0.191	0.577	0.577	0.884	0.168	

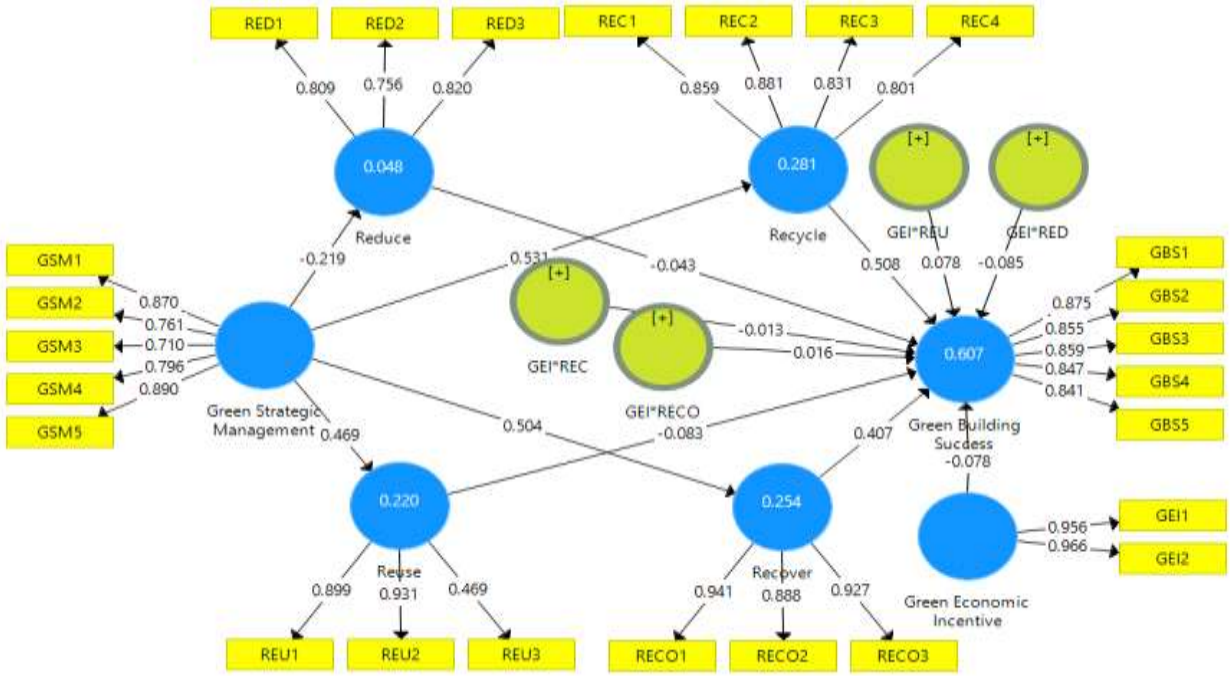


Figure 2: Assessment Model

4.3. Structural Model Assessment

After the assessment of the measurement model, the structural model also evaluated which significance of the proposed model has been measured based on t-values, path coefficient, and standard errors. By using bootstrapping procedures in Smart-PLS, the direct and indirect effects of relationships and hypotheses have been tested (Ringle et al., 2005).

Table 4: Direct Relationships

Relationships	Beta	STDEV	T Statistics	P Values	Decision
GEI → GBS	-0.078	0.019	4.054	0	Supported
GMS → Rec	0.531	0.031	17.021	0	Supported
GMS → Reco	0.504	0.025	20.485	0	Supported
GMS → Red	-0.219	0.029	7.554	0	Supported
GMS → Reu	0.469	0.028	16.837	0	Supported
Rec → GBS	0.508	0.026	19.262	0	Supported
Reco → GBS	0.407	0.034	12.143	0	Supported
Red → GBS	-0.043	0.018	2.34	0.02	Supported
Reu → GBS	-0.083	0.032	2.586	0.01	Supported
GEI*REC → GBS	-0.013	0.029	0.454	0.65	Not Supported
GEI*RECO → GBS	0.016	0.039	0.403	0.687	Not Supported
GEI*RED → GBS	-0.085	0.017	4.946	0	Supported
GEI*REU → GBS	0.078	0.033	2.368	0.018	Supported

According to Table 4, all the direct relationships are significant except a few. However, there is a significant relationship between green management strategy with reduce (B= -0.219, P < 0.05), reuse (B= 0.469, P < 0.05), recycle (B= 0.531, P < 0.05) and

recovery (B= 0.504, P < 0.05), on the other hand, circular economic practice such as reduce (B= -0.043, P < 0.05), reuse (B= -0.083, P < 0.05), recycle (B= 0.508, P < 0.05) and recover (B= 0.407, P < 0.05) have significant impact on green building success. The green economic incentives have a significant moderating role between reduce (B= -0.085, P < 0.05), reuse (B= 0.078, P < 0.05), and green building success but have an insignificant impact between recycle (B= -0.013, P < 0.05), recover (B= 0.016, P < 0.05).

According to Table 5, all indirect relationships are significant which circular economic practices such as reduce (B= 0.009, P < 0.05), reuse (B= -0.039, P < 0.05), recycle (B = 0.27, P < 0.05), and recover (B= 0.205, P < 0.05) have significant mediating role between green management strategy and green building success.

Table 5: Indirect Relationships

Relationships	Beta	STDEV	T Statistics	P Values	Decision
GSM → Rec → GBS	0.27	0.023	11.543	0	Supported
GSM → Red → GBS	0.009	0.004	2.126	0.034	Supported
GSM → Reu → GBS	-0.039	0.015	2.676	0.008	Supported
GSM → Reco → GBS	0.205	0.021	9.644	0	Supported

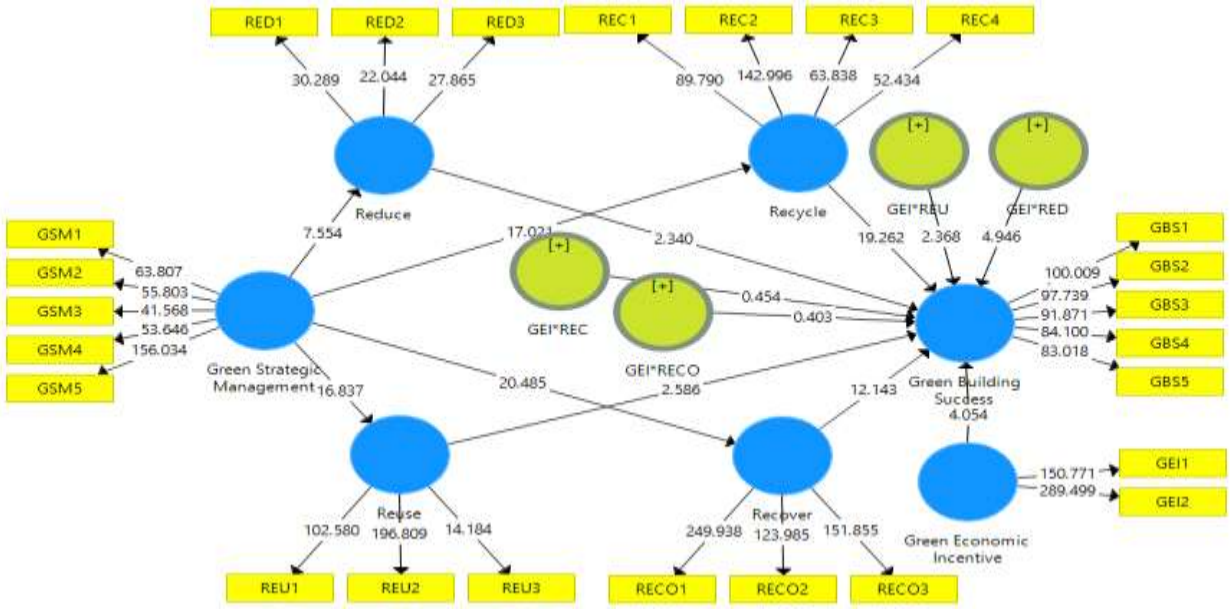


Figure 3: Measurement Model

According to figure 4, there are red, blue and green lines that are showing the trend of moderating role of green economic incentives between recovery and green building success. However, the high level of green economic incentives has insignificant impact between recovery and green building success. On the other hand, lower level of green economic incentives has little insignificant moderating impact between recovery and green building success.

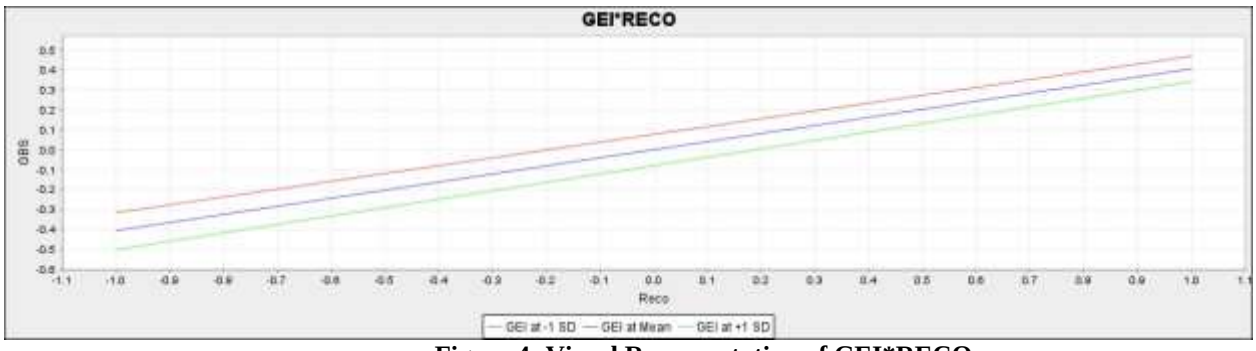


Figure 4: Visual Representation of GEI*RECO

According to figure 5, the results indicated that green economic incentives has significant moderating role between reduce and green building success. But the figure five represented that in case of less green economic incentives lead towards decreasing in green building success. When there is high level of green economic incentives so, more chances to enhance green building success.

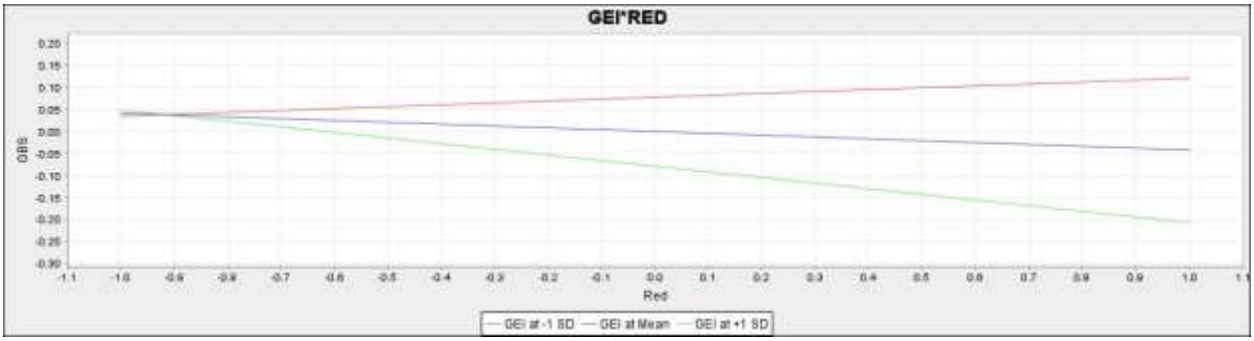


Figure 5: Visual Representation of GEI*RED

According to figure 6, there is not significant impact between reuse and green building success in case of low green economic incentives. When green economic incentives is high so, reduce practices increased green building success.

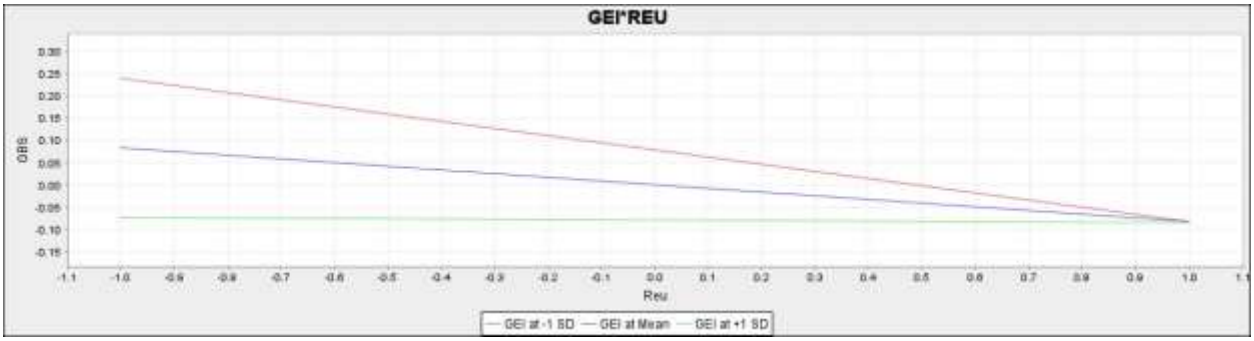


Figure 6: Visual Representation of GEI*REU

According to figure 7, when the green economic incentive is low so there is no significant relationship between recycle and green building success. When it comes at average and high level so recycle practices create negative impact on green building success.

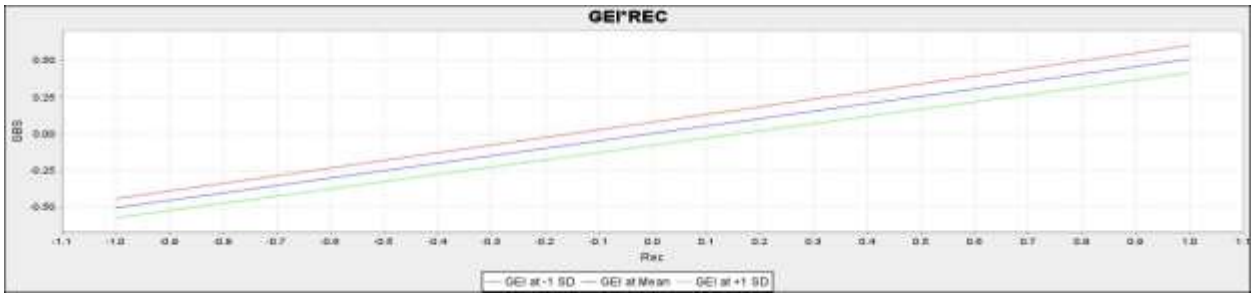


Figure 7: Visual Representation of GEI*REC

5. Discussion

According to the results, all the direct and indirect relationships are significant except two. In this regard, green management strategies have a significant impact on green building success by promoting circular economic practices within the organization to reduce the negative impact on the environment. The current study has highlighted the mediating role of circular economic practices with dimensions such as reduce, reuse, recycle, and recover. The circular economic practices contributed significantly by encompassing energy sources efficiently, sustainable materials, and eco-friendly operations (Li et al., 2022). The study outcomes have suggested that organizations can be successful in green building projects by incorporating green management strategies and circular economic practices. The effective circular economic practices increased the focus of the organization towards reducing waste, reusing material, recycling resources, and capacity to recover from wastage (Pan et al., 2022). The effectiveness of green management strategies enhanced the sustainable operations of organizations (Liu et al., 2017). The impact of green management strategies on green building success may be less prominent without incorporating circular economic practices (Ferreira Gregorio et al., 2018). The principles of circular economic practices align the operations and processes of an organization for resource efficiency and sustainability (Suárez-Eiroa et al., 2019). Therefore, there is a significant moderating role of green economic incentives for green building success but green economic incentives have an insignificant relationship between recycle and green building success as well as between recover and green building success. Some factors cause of insignificant relationships between recycle, recover, and green building success such as complexity in implementation, organizational & behavioral factors, regularity & market conditions, and mismatch between incentives and organizational goals (Khayyat et al., 2024). The previous study demonstrated that increasing the green economic incentives helped to develop proficiency in green management strategies and circular economic practices (Subramanian & Suresh, 2022). The cost, technological, and logistic problems created an influence on the efficiency of the organization's operations and strategies. The green economic incentives have reduced the burden of finance related to investment in green building projects (Circo, 2007).

5.1. Theoretical Implications

The study can play an imperative role in understanding the importance of green management strategies and circular economic practices. The research findings may contribute to existing literature on sustainability through the role of circular economic practices. The understanding of green economic incentives can significantly provide views for green building success (Zhang et al., 2019). The circular economic practices can release pressure from regularity bodies in terms of environmental standards which can be helpful for the construction sector (Ghisellini et al., 2016). The results of the study can demonstrate how these green management strategies and circular economic practices can contribute to the effectiveness of green building projects.

5.2. Practical Implications

In the context of this study, the project managers and policymakers can be able to effectively design green management strategies for the aptitude of circular economic practices. For meritorious implementation of the circular economic practices for green building, success can be achieved through green management strategies (Xue et al., 2018). The manager may be incapable of incorporating challenges and incentives in practices and strategies (Shet et al., 2022). The research can provide valuable insights for managers to establish sustainable strategies.

6. Conclusion

The main aim of this study is to explore the role of green management strategies on green building success through circular economic practice and the moderating effect of green economic incentives. The research delivered how green management strategies can enhance green building success by incorporating circular economic practices such as reduce, reuse, recycle, and recover in the regular operation of an organization. The current study is focused on creating unique value for organizations to achieve green building success. The direct and indirect hypotheses and theory of this research have been tested by using the Smart-PLS tool for the evaluation of assessment and structural models. Smart PLS considered as most significant tool that helps to achieve research objectives. In this regard, all the direct and indirect relationships are significant. However, the green building success is highly dependent on green management strategies and circular economic practices.

7. Future Recommendations and Limitations

The research has used cross-sectional data so; longitudinal data can be investigated in future research. The sample size is 384 which can be increased for further research and investigation of the result from different viewpoints. In the future, green supply chain, green market reflectiveness, and green entrepreneurial orientation, green knowledge management process, and green innovations can be used for green building success. In future research, more cities can be added for data collection for more reliable results.

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