



Research Article

## Green Governance and Climate Change Mitigation: Institutional Strategies for Sustainable Environmental Management

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### Abstract

Climate change continued to pose significant environmental challenges that required effective governance mechanisms to support sustainable environmental management and climate mitigation efforts. This study investigated the influence of green governance on climate change mitigation by examining the roles of environmental policy effectiveness, regulatory enforcement, and stakeholder participation. The study employed a quantitative research design and collected data from a sample of 320 respondents working in public institutions, environmental agencies, and sustainability-focused organizations. A structured questionnaire was used for data collection, and the collected data were analyzed using descriptive statistics, correlation analysis, and multiple regression analysis through SPSS. The findings indicated that environmental policy effectiveness positively influenced climate change mitigation ( $\beta = 0.381$ ,  $p = 0.000$ ), regulatory enforcement exerted a significant positive effect ( $\beta = 0.324$ ,  $p = 0.000$ ), and stakeholder participation also contributed positively to climate mitigation outcomes ( $\beta = 0.287$ ,  $p = 0.000$ ). The correlation analysis revealed strong positive associations among all study variables, while the regression model explained 69.4% of the variance in climate change mitigation ( $R^2 = 0.694$ ). The results demonstrated that institutions implementing effective environmental policies, strong regulatory mechanisms, and inclusive stakeholder engagement achieved better sustainability outcomes and improved climate resilience. The study concluded that green governance represented a critical institutional framework for addressing climate change and promoting sustainable environmental management. The findings provide valuable implications for policymakers, environmental agencies, and organizational leaders seeking to strengthen governance systems and support long-term environmental sustainability.

Keywords: Climate Change Mitigation, Environmental Policy Effectiveness, Green Governance, Regulatory Enforcement, Stakeholder Participation, Sustainable Environmental Management.

## Introduction

Climate change has become one of the major environmental challenges of societies, governments and organizations around the world. The threats of ecological instability and sustainable development from increasing greenhouse gas emissions and global warming, the loss of biodiversity, and more frequent extreme weather events were significant. To address these challenges, policy-makers have highlighted governance-based solutions integrating environmental protection into institutional frameworks and the public decision-making process. The use of environmental principles in government, organizational, and regulatory processes to embed sustainability and resilience to climate change in the management of resources is known as green

governance. Good governance systems enabled environmental policies to be implemented; accountability systems strengthened, and coordination between the various stakeholders to take action on climate change (Dubash, 2021; Javaid et al., 2022). Studies have shown that countries with more robust governance systems have a higher ability to develop and implement environmental policies, which mitigate environmental damage and improve environmental outcomes (Akpan & Kama, 2023).

An increasing role of green governance was motivated by the fact that technological solutions were not enough to solve climate-related issues. The effectiveness of climate change mitigation efforts was more and more determined by institutional arrangements, the quality of the regulations, the coherence of policies, and the involvement of all stakeholders. The Governments have put in place various governance instruments such as carbon reduction policies, environmental regulations, renewable energy incentives, and sustainability reporting obligations, to support the transition towards low-carbon economies. Dubash (2021) noted that climate institutions had a significant influence on the national responses to environmental problems by leading the strategic direction and continuity of policies. The study by Javaid et al. (2022) is consistent with the findings that good institutional quality plays a significant role in the process of climate risk mitigation via institutional mechanisms and environmental policies (Alam & Ansari, 2026)

Cooperative governance models between governments, industry, civil society, and local communities were also critical to environmental governance. Stakeholder involvement in the policy process helped create policy credibility, strengthen environmental decision-making and integrate different knowledge systems into the policy process. Participatory governance mechanisms had positive environmental impacts through increased transparency, accountability, and group problem solving, as shown in studies (Newig et al., 2023). Stakeholder engagement enhanced environmental planning processes, the likelihood of public technical support, and the success of climate policy implementation and sustainability (Holifield & Williams, 2019).

There was still a wide disparity between the impacts of environmental governance systems at the national and institutional levels, despite growing interest in sustainability worldwide. The capacity of many governments in relation to climate mitigation goals was restricted due to weak regulatory efforts, disjointed institutional arrangements, and insufficient stakeholder engagement, as well as policy inconsistencies. The implications of these challenges were that more comprehensive institutional strategies were needed to enhance the effectiveness of governance and to facilitate sustainable management of the environment. To that end, this study analyzes the relation between green governance and climate change mitigation with the emphasis on the effectiveness of the environmental policy, enforcement of environmental laws and the involvement of different interest groups in sustainable environmental management as the main institutional factors. The study aimed to bring some empirical data to the table on the mechanisms of governance that fostered environmental sustainability and climate resilience.

### ***Background of the Study***

Environmental governance was developing in a way that went beyond a regulatory approach to more integrated governance mechanisms with a focus on sustainability, participation, and institutional accountability. Recognizing climate change as a multi-dimensional challenge, the approach of responding in a coordinated manner at trans-sector and multi-governance levels was increasingly reflected in environmental governance frameworks. Countries were motivated to enhance domestic governance structures and establish institutional frameworks that would help reach long-term climate goals through other international agreements like the Paris Climate Agreement. The influence of governance frameworks on the promotion of environmental sustainability and the reduction of climate change risks was also explored (Dubash, 2021). The results of the research consistently indicated that the effectiveness of the institution had a significant impact on environmental outcomes and the effectiveness of policy implementation.

Green governance was born as a strategic approach that introduced the environmental dimension in policy making, management, and administration. The governance structure was outlined to be transparent, accountable, regulatory-compliant and collaborative among stakeholders in the attainment of environmental

objectives. Good governance structures facilitated governments to have environmental standards, monitor compliance, and encourage sustainable development principles in the economic sectors. The empirical evidence highlighted that countries with higher institutional quality performed better on environmental performance and lower pollution levels than countries with poor institutional quality (Akpan & Kama, 2023). Appiah et al. (2022) established that the quality of institutions played a significant part in carbon mitigation efforts by facilitating effective environmental policies and sustainable development interventions.

The other fundamental element of green governance was stakeholder participation. Collaborative governance was usually required to ensure solutions to environmental challenges worked for a range of stakeholder groups with different interests. The promotion of participatory governance practices facilitated information sharing, consensus development, and inclusive decision-making, leading to better environmental outcomes. Newig et al. (2023) carried out a meta-analysis of 305 cases of environmental governance, and they found that, overall, stakeholder involvement in environmental governance led to favourable results. Moreover, it helped to create policy legitimacy, improve public confidence, and to better quality of environmental decision-making. Previous work by Reed (2008) and Brody (2003) also highlighted the effectiveness of meaningful stakeholder engagement for enhancing the effectiveness and sustainability of environmental planning.

### **Research Problem**

The pace of climate change continued at a higher level despite the increase in international commitments and in the field of environmental policies. There was also variation in the efficacy of environmental policies, sustainability policies, environmental plans and climate action plans adopted by many governments. Poor governance frameworks, inadequate regulation, low stakeholder engagement, and institutional inefficiency limited the effectiveness of climate mitigation measures. In existing literature, governance quality was discussed as an essential tool to manage environmental issues, but empirical evidence on the effectiveness of specific institutional mechanisms that can offer improvements in climate change mitigation was still scattered and inconclusive. These studies have generally focused on one dimension of environmental governance, such as environmental governance or institutional quality, or on stakeholder participation alone, and little research has combined these with the overall concept of environmental governance. With the need for coordinated institutional responses to climate change, the interactions among the effectiveness of environmental policies, the enforcement of regulations, and stakeholder involvement in sustainable environmental management became more important.

### **Research Objectives**

1. To examine the effect of environmental policy effectiveness on climate change mitigation.
2. To evaluate the influence of regulatory enforcement on sustainable environmental management.
3. To investigate the impact of stakeholder participation on climate change mitigation outcomes.
4. To assess the overall contribution of green governance to sustainable environmental management.

### **Research Questions**

- Q1. How did environmental policy effectiveness influence climate change mitigation?
- Q2. What effect did regulatory enforcement exert on sustainable environmental management?
- Q3. How did stakeholder participation contribute to climate change mitigation outcomes?
- Q4. To what extent did green governance support sustainable environmental management?

### **Research Hypotheses**

H1: Environmental Policy Effectiveness positively influences Climate Change Mitigation and Sustainable Environmental Management.

H2: Regulatory Enforcement positively influences Climate Change Mitigation and Sustainable Environmental Management.

H3: Stakeholder Participation positively influences Climate Change Mitigation and Sustainable Environmental Management.

## **Literature Review**

### ***Environmental Policy Effectiveness and Climate Change Mitigation***

The effectiveness of environmental policy was an integral part of green governance as it created regulatory and strategic conditions for climate change mitigation. Good environmental policy sets clear environmental goals, encourages sustainable use of resources, and supports the use of low-carbon technologies in economic sectors. Studies showed that the design of the climate policies was a pivotal factor in lower greenhouse gas emissions and better environmental performance. Climate governance institutions contributed to strengthening policy implementation through policy continuity and holding actors accountable for actions across political cycles (Dubash, 2021). Moreover, findings indicated the success of policy making was more effective when it was embedded in national development plans and had a strong institutional framework (Javaid et al., 2022).

The use of environmental regulations, carbon pricing, incentives for renewable energy, and sustainability standards was growing among governments as a way to combat climate issues. These policy tools helped induce changes in behaviour among both industries and consumers and they helped spur investments in sustainable technologies. Appiah et al. (2022) found that robust institutional structures facilitated the implementation of environmental policies, such as compliance with regulations, and also aided in achieving sustainable goals. Stronger governance systems positively impacted environmental outcomes through better climate-related policy enforcement and effectiveness, and institutional quality was reported to have a significant effect by Akpan and Kama (2023).

Transparency, policy coherence and administrative capacity were also crucial for the effective implementation of environmental policy, and their importance was tied to climate mitigation. Countries with robust regulations were the most effective in meeting environmental goals and reducing environmental harm. Environmental policies that are supported by monitoring systems and performance evaluation mechanisms and inter-agency coordination frameworks resulted in improved outcomes. The study revealed that policy consistency and governance quality were significantly related in the context of environmental sustainability, with environmental implementation barriers significantly reduced, and climate action initiatives significantly strengthened (Javaid et al., 2022).

### ***Sustainable Environmental Management and Regulatory Enforcement***

Finally, regulatory enforcement was another key component of green governance, as it was essential that policies have a real impact on the environment. Environmental enforcement systems were in place to guarantee consistent implementation of environmental laws and compliance with sustainability standards by organisations. Improved regulatory institutions led to greater accountability, reduced harmful activities for the environment, and improved environmental protection measures. Pollution reduction and enhancement of environmental quality were shown to be a main component of effective pollution control, which promoted compliance with environmental laws via effective enforcement mechanisms (Akpan & Kama, 2023).

The capacity of institutions was still an important driver of the effectiveness of regulatory enforcement. Generally, environmental compliance was better in countries with a well-developed administrative system and monitoring capacity. Environmental agencies had to have adequate resources, technical capacity, and law enforcement capacity to monitor environmental performance and effectively respond to violations. The study showed that improved institutional quality led to improved environmental governance outcomes by improving policy implementation and regulatory systems (Appiah et al., 2022). Climate governance institutions enhanced environmental management through the coordination of enforcement activities and through assisting in advancing long-term sustainability objectives (Dubash, 2021).

As the environmental issue became more complex, the need for adaptable and responsive regulatory systems rose. Regulatory frameworks were needed that would create a framework to promote innovation in sustainable

practices and to respond to new climate change risks. Effective enforcement created organizational accountability and spurred businesses to behave in an environmentally responsible way. Moreover, the enforcement mechanisms helped to build the confidence of the public in the governance of the environment, due to their ability to show the government's dedication to sustainability goals. The current literature, based on past research, showed that the quality and effectiveness of regulations and oversight substantially affected the environmental outcomes and climate resilience, thus playing an important role in promoting sustainable environmental management (Javaid et al., 2022).

### ***Stakeholder Involvement and Climate Change Mitigation***

The principle of stakeholder participation became an important lesson of the present climate governance due to the impacts of climate-related issues impacting a wide spectrum of stakeholders across society. The involvement of governments, businesses, civil society and local communities through participatory governance promoted partnership building. This collaboration enhanced the environmental decision-making process and fostered multi-stakeholder perspectives and collaborative problem-solving. Stakeholder involvement generally led to positive environmental governance outcomes as well, which included enhanced quality of decision-making and effectiveness of implementation, as reported by Newig et al. (2023). Participatory approaches were found to improve environmental management by promoting knowledge sharing and motivating the commitment of stakeholders to sustainable initiatives, as Reed (2008) recently noted.

Environmental governance was enhanced by meaningful engagement with stakeholders using a process that gained transparency, accountability and trust. The inclusion of stakeholders in policy-making and/or policy implementation rendered environmental policies more legitimate and socially acceptable in nature. Collaborative governance frameworks enhanced the environmental planning outcomes, as it incorporates all knowledge and expertise from the local community and stakeholders to guide environmental management processes (Holifield & Williams, 2019). Engaging stakeholders contributed to strengthening institutional responsiveness and facilitating the development of climate solutions adapted to the local context that can meet the climate challenges in the area.

The participation of the stakeholders also played a role in climate change mitigation by fostering the shift in action and shared environmental responsibility. Environmental governance systems increasingly recognize the need to involve a partnership between public and private actors when working towards the goal of sustainability. Strategies for collaboration were used to mobilise resources, to develop effective policy responses, and to build capacity to adapt to environmental risks. Zuniga-Teran et al. (2022) found that stakeholder involvement enhanced the environmental assessment and decision-making processes, resulting in more sustainable environmental outcomes. Metzger et al. (2017) suggested that stakeholder participation was a positive aspect that increases the effectiveness of governance by creating consensus and adding value to environmental planning.

### ***Conceptual Framework***

#### *Independent Variable*

Environmental Policy Effectiveness

Regulatory Enforcement

Stakeholder Participation

#### *Dependent Variable*

#### *Climate Change Mitigation (Sustainable Environmental Management)*

The conceptual framework suggested that both environmental policy effectiveness and regulatory enforcement, and stakeholder engagement are positively associated with environmental flows and sustainable

management of the environment.

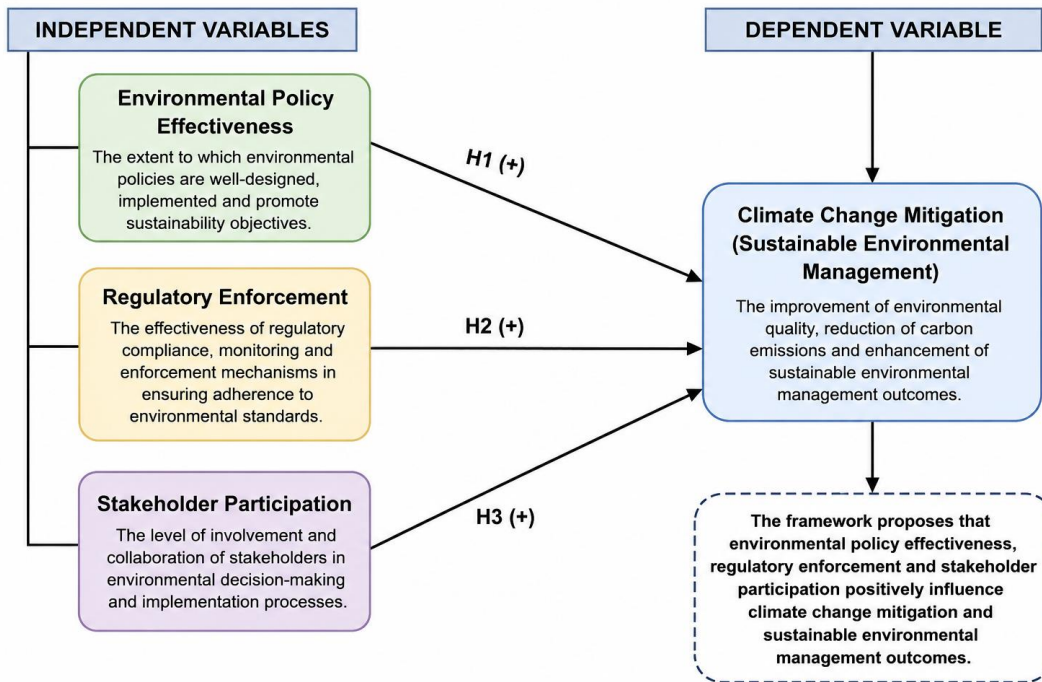


Figure 1. Conceptual framework model.

## Research Methodology

### Research Design

The study adopted a quantitative research design to examine the effect of green governance on climate change mitigation and sustainable environmental management. The quantitative approach offers a systematic framework for exploring the relationships between the effectiveness of environmental policies, regulatory enforcement, stakeholder participation, and climate change mitigation. A cross-sectional survey design was used due to the collection of data from the respondents at a specific time. This is a design that allowed the researcher to be able to examine the perceptions of green governance practices and their contribution to environmental sustainability.

### Population of the Study

The target group comprised employees, managers, policy makers, environmental officers and sustainability professionals in public institutions, environmental agencies, governmental institutions and sustainability-driven institutions. These stakeholders had experience and expertise on environmental governance, policy implementation, regulatory compliance and climate change management. The sample of the city population gave relevant information on institutional strategies and governance practices related to environmental sustainability and climate mitigation.

### Sample Size and Sampling Technique

A sample of 320 respondents was chosen to be used in the study. The sample comprised those engaged in environmental management, governance and/or sustainable activities within different organizations. This study used purposive sampling as respondents who were selected were those who were professionally engaged in environmental governance and decision-making processes on climate change issues.

### Data Collection Method

Primary data were gathered by using a structured questionnaire. The questionnaire included closed-ended questions that were used to assess the important constructs of the research variables, including overall

effectiveness of the environmental policy, enforcement of laws, involvement of stakeholders, and climate change mitigation. Eligible respondents were surveyed using the survey instrument, which was sent out electronically and in print. After providing the informational content about the purpose of the research, participants filled in the questionnaire voluntarily. Measurement of Variables

All variables measured in the study were scored on a five-point Likert scale, which ranged from 1=Strongly Disagree to 5=Strongly Agree. Environmental Policy Effectiveness evaluated the degree to which environmental regulations and policies advanced environmental sustainability goals. Regulatory Enforcement assessed how well compliance monitoring and implementation mechanisms were working. Stakeholder Participation assessed the extent to which stakeholders are involved in environmental decision-making processes. Climate Change Mitigation assessed the institutional as well as the impact of reducing environmental risks, carbon emissions, and sustainability challenges. The construct validity and reliability were ensured by adapting multiple measurement items from previous environmental governance and sustainability studies.

### **Research Instrument**

The main research instrument used was the questionnaire. It was divided into two parts. The first section gathered demographic data about the respondents, such as their age, gender, educational level, and work experience. The second section contained statements pertaining to the study variables. The questions were answered using a Likert Scale 5-point with answers ranging from strongly agree to strongly disagree. Content of the instrument was validated by academic experts and environmental management professionals for content validity, clarity, and relevance to the objectives of research.

### **Data Analysis Techniques**

The data collected were analysed with the Statistical Package for Social Sciences (SPSS 27). The respondent variables and frequencies were summarized using descriptive statistics (frequencies, percentages, means, and standard deviations). Reliability analysis was performed by Cronbach's Alpha for the internal consistency of the items of the measurement. Pearson correlation analysis was used to explore the relationships between study variables. To assess the effects of the effectiveness of environmental policy, the enforcement of regulatory policy, and the participation of stakeholders on climate change mitigation, multiple regression analysis was conducted. A 5% significance level was used for the hypotheses.

## **Results and Analysis**

### **Descriptive Statistics**

Descriptive Statistics were carried out to investigate the central tendency and dispersion of the study variables. The analysis covered an overview of the attitudes of the respondents with regard to the effectiveness of environmental policy, the enforcement of the environmental regulations, participation in decision-making by various stakeholders, and climate change mitigation. Overall agreement among the respondents and consistency of their responses were determined by calculating mean values and standard deviations.

Table 1. Descriptive statistics of study variables.

Variables	Mean	Std. Deviation
Environmental Policy Effectiveness	4.18	0.61
Regulatory Enforcement	4.10	0.66
Stakeholder Participation	4.14	0.59
Climate Change Mitigation	4.25	0.57

Descriptive statistics indicated that all the study variables had a mean of above 4.00, which indicated high

agreement among the respondents about the effectiveness of the respondent's Green governance practices and Climate change mitigation initiatives. Respondents seem to be positive about environmental management efforts and climate mitigation measures, as indicated by the highest mean value (M = 4.25) for Climate Change Mitigation. The mean score for Environmental Policy Effectiveness (4.18) was high, indicating a high level of confidence in environmental policies and governance structures. These findings also showed that the mean of Stakeholder Participation was 4.14, whilst Regulatory Enforcement had a mean score of 4.10. The results of this showed that respondents were convinced that the aspects of stakeholder involvement and compliance were important in fostering environmental sustainability. Most scores were generally high, indicating overall acceptance of a governance approach to climate change mitigation and protection of the environment. The range of standard deviations lay between 0.57 and 0.66, which represented fairly low levels of variability in the opinion of the respondents. This gave a promising indication that participants' responses were quite consistent and that they had a fairly similar perception of the relevance of green governance mechanisms. Results indicated a preliminary positive effect of both environmental policy effectiveness and regulatory enforcement, and stakeholder participation on climate change mitigation.

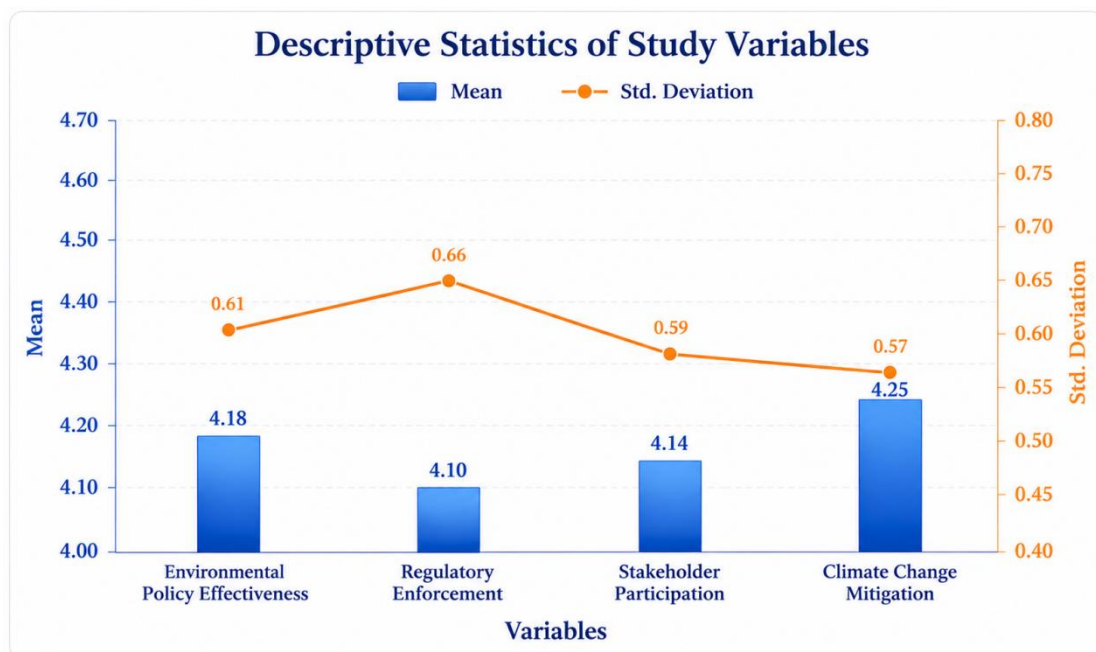


Figure 2. Descriptive statistics of study variables.

**Correlation Analysis**

The strength and direction of the relationships among the variables of the study were examined using Pearson correlation analysis. Analysis was undertaken to establish the linkage between the effectiveness of environmental policy and climate change mitigation, environmental regulatory enforcement and climate change mitigation, and stakeholder participation and climate change mitigation.

Table 2. Correlation Matrix.

Variables	1	2	3	4
1. Environmental Policy Effectiveness	1			
2. Regulatory Enforcement	0.648	1		
3. Stakeholder Participation	0.611	0.593	1	
4. Climate Change Mitigation	0.724	0.681	0.659	1

Correlation analysis revealed that all of the variables involved in this study had positive and statistically significant correlations. Improvement of environmental policy effectiveness had the highest correlation with Climate Change Mitigation ( $r = 0.724, p < 0.01$ ), suggesting that the better it could be done, the better it would be. The result indicated the possibility of effective environmental policies to serve as an important driver of sustainable environmental management. There was also a high positive correlation between Regulatory Enforcement and Climate Change Mitigation ( $r = 0.681, p < 0.01$ ). This discovery highlighted that tougher enforcement systems helped to yield better environmental outcomes and greater climate resilience. Stakeholder Participation also showed a strong positive relationship with Climate Change Mitigation ( $r = 0.659; p < 0.01$ ), underlining that a high level of collaboration within governance and multi-stakeholder engagement is a central pillar of environmental decision-making processes.

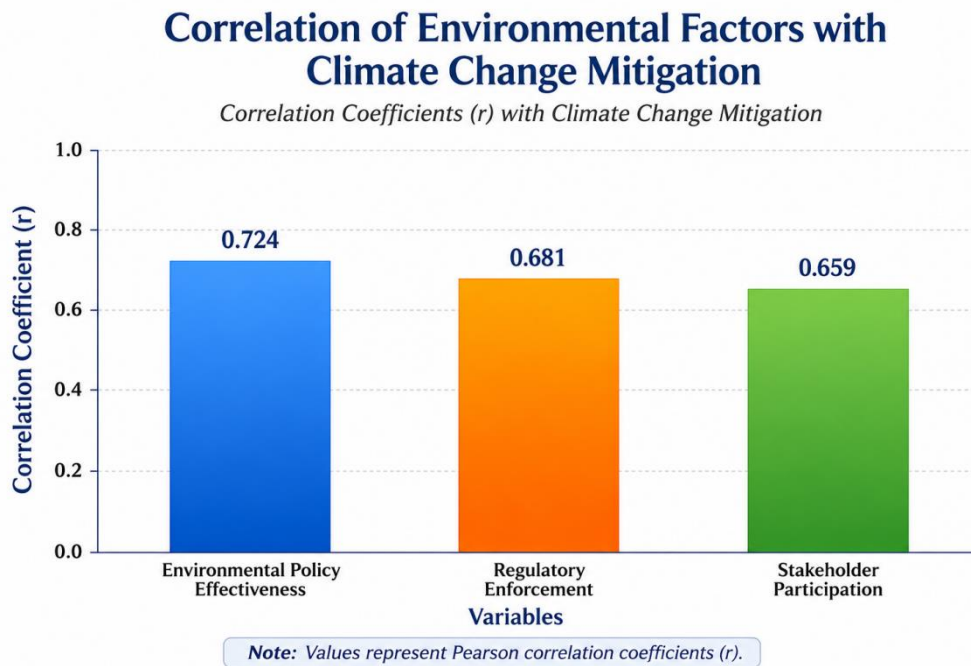


Figure 3. Correlation Matrix.

### Multiple Regression Analysis

Multiple regression analysis was performed to determine the influence of environmental policy effectiveness, regulatory enforcement, and stakeholder participation on climate change mitigation. The analysis assessed the predictive power of the independent variables and evaluated the proposed research hypotheses.

Table 3. Regression results.

Predictor Variables	Beta ( $\beta$ )	t-value	p-value
Environmental Policy Effectiveness	0.381	8.45	0.000
Regulatory Enforcement	0.324	7.29	0.000
Stakeholder Participation	0.287	6.53	0.000

Model Summary	Value
R	0.833
R <sup>2</sup>	0.694
Adjusted R <sup>2</sup>	0.691

Predictor Variables	Beta ( $\beta$ )	t-value	p-value
F-value		238.71	
Sig.		0.000	

The regression results showed that all three independent variables had a significant positive impact on Climate Change Mitigation. Environmental Policy Effectiveness was the most significant factor, with a  $\beta$  of 0.381 and a significant p value of <0.001, showing that policy design, implementation, and governance of environmental policy are indeed significant components of enhancing climate mitigation outcomes. Regulatory Enforcement also had an important positive impact on Climate Change Mitigation ( $\beta = 0.324, p < 0.001$ ). The discovery revealed that compliance monitoring, regulatory oversight, and regulations in environmental protection became more effective and promoted cooperation with the sustainability standards when remedial measures, including sanctions, penalties, or enforcement actions, were put in place. The effects of Stakeholder Participation on Climate Change Mitigation were positive, statistically significant, and with a value of  $\beta = 0.287$  and  $p < 0.001$ . This finding indicated that integrated governance, participation and consensus building boosted the effectiveness of environmental programs. The model accounted for 69.4% variance in Climate Change Mitigation ( $R^2 = 0.694$ ), which suggests a strong explanatory power in the model. The overall model was found to be significant ( $F = 238.71, p < 0.001$ ), confirming the effectiveness of the overall model to predict climate mitigation outcomes and thus also the proposed theoretical framework.

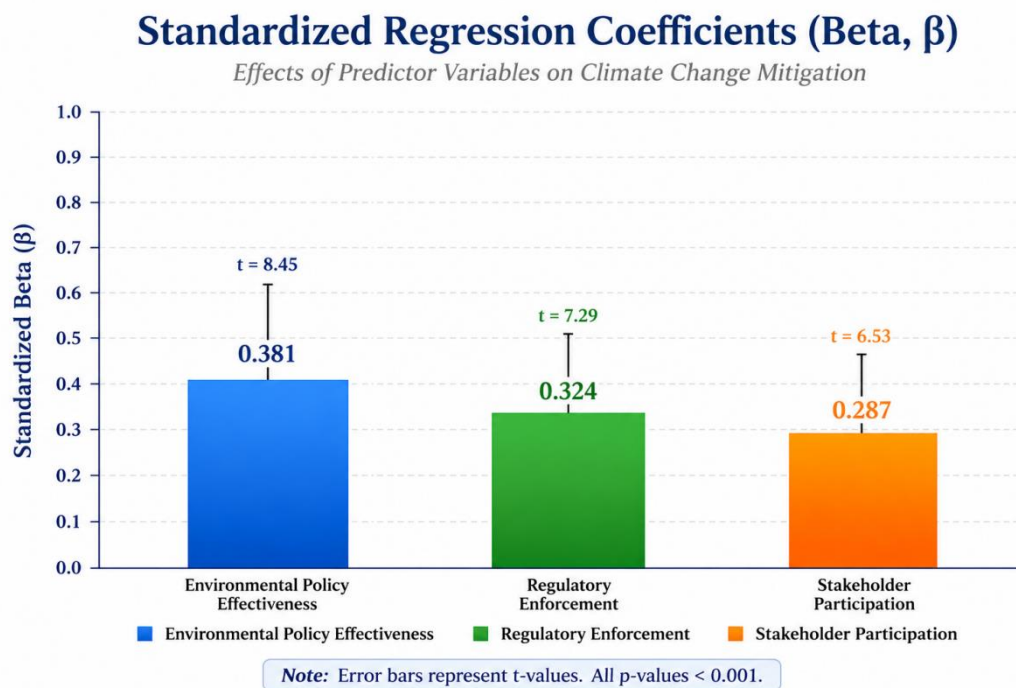


Figure 4. Regression Results.

### Hypotheses Testing

Table 4. Summary of hypotheses testing.

Hypothesis	Relationship	Beta ( $\beta$ )	p-value	Result
H1	Environmental Policy Effectiveness → Climate Change Mitigation	0.381	0.000	Supported
H2	Regulatory Enforcement → Climate Change Mitigation	0.324	0.000	Supported
H3	Stakeholder Participation → Climate Change Mitigation	0.287	0.000	Supported

Results of the hypothesis testing showed that the hypotheses had all been supported by empirical evidence.

Environmental Policy Effectiveness also had a significant effect on Climate change Mitigation, indicating that good environmental policies made a difference to sustainability outcomes. The results indicated that the role of policy quality continued to be a key driver in solving climate-related issues and building environmental resilience. The findings also supported the finding that Regulatory Enforcement had a positive impact on Climate Change Mitigation. Environmental governance improved, and sustainable development targets were bolstered by effective monitoring systems and compliance mechanisms. Organizations with strong showed higher levels of commitment towards environmental responsibility and climate action.

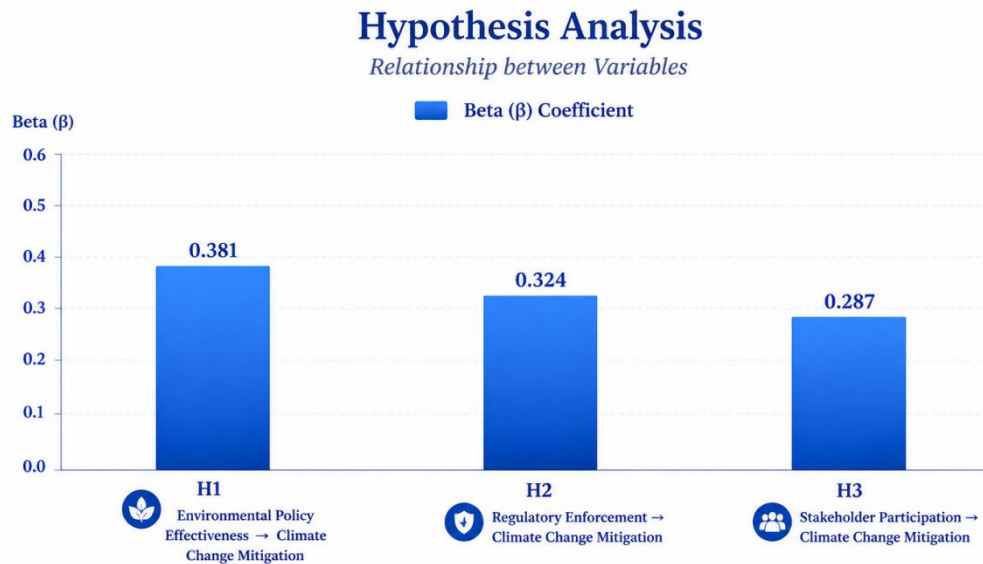


Figure 5. Summary of hypotheses testing.

## Discussion

Results showed that green governance had a significant contribution in mitigating climate change and sustainable management of the environment. The regression test showed that the factor with the most significant influence is the effectiveness of environmental policy in promoting climate change mitigation, followed by regulatory enforcement and participation by stakeholders. The results indicated that improving environmental outcomes resulted from the development of comprehensive environmental policies and the incorporation of sustainability goals in governance structures. Good environmental policies developed clear environmental regulation, fostered resource efficiency and promoted 'climate responsible acts' of organisations and stakeholders. Jordan et al. (2022) found the same: Institutions for Climate Governance were found to have boosted environmental performance by coping with policy incoherence and long-term climate solutions planning. According to Bäckstrand et al. (2021), good governance systems contributed to a better way of implementing the environmental policy and supporting climate mitigation in various sectors.

The importance of the relationship between policy effectiveness and climate change mitigation suggests that policy quality is still an important driver for environmental sustainability. Environmental policies gave direction to climate action processes and supported the implementation and integration of sustainability values by public and private institutions. The results indicated that prioritizing the formulation of policy gave better results in mitigating environmental risks and enhancing climate resilience, for the government and the organizations. The findings of this study corroborated the findings of Lockwood (2021), which concluded that better institutional environmental governance approaches enhanced the effectiveness of climate policy and improved institutional responses to environmental problems. Duit et al. (2023) found that governance systems that were more consistent in policies and more accountable in institutions resulted in more positive environmental outcomes and stronger climate adaptation capacity.

The success of the enforcement action in positively affecting climate change mitigation showed the value of the role of compliance monitoring and institutional control in meeting sustainability goals. When they obeyed

the law and the environment, environmental rules had a positive impact. The results showed that good enforcement measures promoted EEB behaviors and environmental protection measures. Thus, regulatory institutions became important actors in implementing environmental policies into action. This finding matched the findings of Jänicke and Quitzow (2022) finding that a higher degree of regulatory quality was the decisive contributing factor for conducting environmental innovation efforts and for carbon reduction. Moreover, Khan et al. (2023) found that the effectiveness of the enforcement systems had a positive effect on environmental performance, fostering compliance with green regulations and mitigating the environmental impact.

The results also showed that stakeholder involvement played an important role in affecting climate change mitigation. The results showed that action in the area of climate mitigation needed to be taken at a collective level by a variety of stakeholders rather than by the government alone. Vesa et al. (2020) have remarked that participatory governance enhanced policy legitimacy and environmental outcomes by creating a sense of collaboration in decision-making processes. Similarly, Aylett (2022) highlighted that the inclusion of stakeholders increased the effectiveness of environmental governance through transparency, trust and accountability.

An additional interesting conclusion was related to the joint explanatory abilities of the dimensions of green governance. The overall fitted model predicted 69.4% of the variance in climate change mitigation, suggesting that the action of the environmental policies, the enforcement of regulations and the involvement of the stakeholders in the process of sustainable environmental management were important. This discovery indicated that the more coordinating and integrated governance mechanisms there are, the more effective the effort of mitigation action is. Both policies and mechanisms for enforcing them were effective, and stakeholder involvement improved the acceptance and implementation of policies. This was backed by Bulkeley et al. (2021), who found that holistic governance arrangements could create better environmental results than non-holistic policy mechanisms. Biermann and Kim (2020) claimed that a coordinated governance system contributed to environmental resiliency by making governance action toward the sustainability goals.

This was also confirmed by findings that showed that institutional capacity has come back to be a key factor in environmental sustainability activities. Ecosystems under effective governance showed greater intentions to mitigate climate change and be environmentally responsible. Policy implementation was assisted by enabling institutions, which also helped with regulatory compliance and led to stakeholder participation, thus enabling sustainable development. These results were consistent with the literature on environmental governance more generally, which highlighted the importance of the capacity of institutions to perform in a way that meant they were able to contribute to overcoming a complex environmental problem. Newig et al (2023) found that worthy environmental outcomes were delivered and long-term environmental sustainability performance was improved through governance systems that were transparent, accountable, and participatory.

## **Conclusions**

This study analyzed the implementation of environmental governance and its contribution to climate change mitigation from a political perspective, considering the effectiveness of the environmental policy, enforcement of the items and introducing stakeholder participation as the key aspects that are required in order to make the policy deliver environmental sustainability. It was found that all three governance dimensions had significant positive effects on taking measures to reduce the impact of climate change. The most significant predictor of environmental policy effectiveness was stakeholder participation ( $\beta = 0.287$ ), followed by regulatory enforcement ( $\beta = 0.324$ ) and environmental policy effectiveness ( $\beta = 0.381$ ). The correlation analysis showed that independent variables were in positive & strong relations with CHM, signifying the role of integrated governance mechanisms in CHM. In addition, the regression model has a highly satisfactory score of  $R^2 = 0.694$ , thus has high explanatory power on Climate Change Mitigation. The study found that institutions that had good environmental policies, had improved institutional governance in terms of

environmental compliance, and were actively involved with environmental stakeholders achieved better environmental performance and improved climate resilience. Green governance thus became a key approach in fostering sustainability and assisting in the support of long-term environmental protection goals.

## **Recommendations**

Government and environmental agencies should create a more robust environmental policy framework, with the aim of making it more consistent, transparent and sustainable. There is a need for incorporating elements of climate in national development plans of the states and adopting specific benchmarks for environmental performance. Environmental monitoring and compliance mechanisms and regimes should be strengthened and enforcement practices should be improved. There should be adequate resources placed in the environmental management programmes in the organisations and conduct regular environmental audits to enhance accountability. The study further suggests greater involvement of stakeholders at various stages of the environmental planning and decision-making process. Climate mitigation should involve a multi-stakeholder design and delivery process by governments, the private sector, civil society and local communities. Conducting public awareness campaigns, involving stakeholders in consultations, and community engagement programs can enhance the sense of environmental responsibility and mobilize collective efforts to reach environmental goals.

## **Future Research Directions**

For future research, more governance elements that can influence the climate change mitigation capacity should be explored, such as institutional transparency, environmental innovation, digital governance, green finance and organizational sustainability practices. Additionally, the moderating and mediating roles of institutional quality, environmental awareness, and technological advancement can be researched on the environmental outcomes. Greater numbers of respondents were needed from a larger population size and across other sectors and countries in order to enhance the validity or generalizability of the results and findings of this study. Long-term research on the impacts of green governance policies on attaining environmental sustainability and climate resilience can be gained through the longitudinal study approach. Empirical comparisons of developed and developing economies can also help to improve the understanding of the influence of governance institutions on the mitigation of climate change and sustainable environmental management.

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