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GREEN FINANCE, CLIMATE RISK, AND SUSTAINABLE DEVELOPMENT GOALS: EVIDENCE FROM PAKISTAN

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Abstract

Climate change and environmental degradation have created significant challenges for sustainable development, particularly in developing economies such as Pakistan. This study examined the relationship between green finance and Sustainable Development Goals (SDGs) by investigating the mediating role of climate risk mitigation. A quantitative cross-sectional research design was adopted, and primary data were collected from 350 respondents including employees of commercial banks, Islamic banks, development finance institutions, and government organizations. Data were analysed using SPSS 29 and SmartPLS 4 through reliability analysis, validity assessment, Partial Least Squares Structural Equation Modelling (PLS-SEM), and mediation analysis. The findings revealed that green finance significantly influenced SDGs achievement ($\beta = 0.452$, $p < .001$) and positively affected climate risk mitigation ($\beta = 0.614$, $p < .001$). Furthermore, climate risk mitigation significantly contributed to SDGs ($\beta = 0.371$, $p < .001$). Mediation analysis confirmed that climate risk mitigation partially mediated the relationship between green finance and SDGs ($\beta = 0.228$, $t = 6.483$, $p < .001$). The study highlights the importance of strengthening green financial policies, climate-resilient investments, and sustainable finance mechanisms to accelerate SDG achievement in Pakistan.

Keywords: Green Finance; Climate Risk Mitigation; Sustainable Development Goals; Sustainable Development; Pakistan.

1. Introduction

Climate change is a major global concern and one that is heavily impacting environmental sustainability, economic growth and social health (Imran, Sultana, & Ahmed, 2023). The increasing risk of climate change, biodiversity loss and the rising frequency of extreme weather events have ramped up the need for sustainable development solutions that address economic development alongside environmental protection (IPCC, 2023; OECD, 2023). Green finance has received growing interest as it is one important financial instrument to attract investments to green projects, renewable energy, energy efficiency and to infrastructure which is climate resilient (Khan, Hussain & Ahmad, 2023). Green finance helps to promote sustainable economic development by using funds for environmental-friendly purposes, and it plays a role in achieving the Sustainable Development Goals (SDGs) (UNEP, 2023; Qadri et al., 2023). Pakistan is extremely prone to climate change challenges, such as frequent floods, droughts, heatwaves, water scarcity, and environmental degradation that require sustainable financing for strengthening national climate resilience and long-term development (World Bank, 2022; Adnan et al., 2024).

Green finance is a crucial element in fostering environmental sustainability by incentivizing investments that lower carbon footprint, enhance resource utilization, and invest in clean technologies (Ali et al., 2024). The State Bank of Pakistan (SBP) has recently introduced sustainable finance policy to encourage

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sustainable finance in Pakistan, including Green Banking Guidelines and the Environmental and Social Risk Management (ESRM) framework (State Bank of Pakistan, 2022). These initiatives can push the progress towards various SDGs such as SDG 13 on climate action, SDG 7 on affordable and clean energy, SDG 11 on sustainable cities, and SDG 12 on responsible consumption, as outlined by Chaudhry & Hussain (2023); Waqas & Khan (2024).

Climate risk is defined as the physical risks and transition risks due to climate change and climate policy (Ahmed, Ahmed & Buriro, 2023). Climate-induced disasters are becoming more frequent in Pakistan and pose a risk to sustainable development through their impact on agriculture, infrastructure, water resources, and public health, threatening to increasingly impact Pakistan's economy (Adnan et al., 2024). Therefore, effective climate risk mitigation is vital for enhanced economic resilience and sustainable economic growth (IPCC, 2023; Nabi et al., 2025).

Although the importance of green finance is gradually gaining traction across the globe, Pakistan is still facing constraints in green finance investment and rising climate risks. As this financing gap becomes significant in addressing effective adaptation and mitigation actions, the role of green finance in sustainable development in the face of increasing climate risks needs to be explored (Nasir et al., 2024; Rahim et al., 2025).

The connection between Green Finance and sustainable development has been discussed in previous research but there is not much empirical research in the context of Pakistan. Moreover, the mediating role of climate risk mitigation in this relationship has been under-researched, thus creating a gap in the literature (Ali et al., 2024; Krastev & Krasteva-Hristova, 2024).

1.1 Research Objectives

1. To examine the impact of green finance on SDG achievement in Pakistan.
2. To investigate the mediating role of climate risk mitigation.
3. To propose policy measures for strengthening green finance for sustainable development.

1.2 Research Questions

1. How does green finance impact SDG achievement in Pakistan?
2. What is the mediating role of climate risk mitigation in the relationship between green finance and SDG achievement in Pakistan?
3. What policy measures can strengthen green finance for sustainable development in Pakistan?

Academically this study is significant because it builds upon the green finance literature, climate risk and sustainable development literature in Pakistan (Qadri et al., 2023; Waqas & Khan, 2024). In practice, it provides guidance to financial institutions and companies on how to improve their green investment policies and enhance environmental sustainability in the economy (Ali et al., 2024; Mehmood & Kamal, 2025). Policy-wise, the results can help policy makers to create effective green finance policies and climate-resilient development frameworks to help achieve the SDGs (Chaudhry & Hussain, 2023; Nabi et al., 2025).

2. Literature Review

2.1 Green Finance

Green finance is defined as financial instruments, investments and policies which support environmentally sustainable economic activities and address climate change and environmental degradation (OECD, 2023). Environmental financing has shifted to a more comprehensive approach that incorporates sustainability into financial systems, including green banking, green investments, green bonds, climate finance and green financial policies (Qadri et al., 2023). Green banking promotes those financial institutions, considering environment and social aspects, allocate funding to renewable energy, clean energy technologies and low carbon infrastructure, while green investments and green bonds provide finance for the same (UNEP, 2023; Chaudhry & Hussain, 2023). In addition to these mechanisms, climate finance also provides funding for climate adaptation and mitigation efforts, and green financial policies create regulatory frameworks that promote sustainable financial practices. The Sustainable Finance and Good Banking Framework (SFA) and the Environmental and Social Risk Management (ESRM) framework by SBP have been adopted in Pakistan to bolster sustainable funding and green investments (SBP, 2022; Nasir et al., 2024).

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2.2 Climate Risk

Climate risk is the threat posed by climate change on the economic, environmental and social systems. The IPCC (2023) defined climate risk as the combination of physical risks, such as droughts, floods, rising sea levels and heatwaves, and transition risks, which are linked to policy changes, technological transformation and transition toward a low-carbon economy. Pakistan is highly vulnerable to climate change; and recurring floods, water scarcity, glacier melting and loss of agricultural productivity pose the threat to sustainable development in the country (World Bank, 2022; Adnan et al., 2024). Therefore, a climate-resilient community or institution is one that is able to react to climate-related shocks, and climate risk mitigation involves reducing the amount of GHGs released into the atmosphere by implementing sustainable policies and investments that increase the adaptive capacity of the community or institution (Nabi et al., 2025).

2.3 Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs) offer a detailed blueprint for environmental, economic, and social development over the next 15 years to 2030 (UN DESA, 2023). Environmental sustainability is about preserving nature's resources and minimising pollution; Economic sustainability is about inclusive and resilient economic growth; and social sustainability is about enhancing wellbeing and diminishing inequalities. The seventeen SDGs are relevant, but SDG 13 (Climate Action) specifically highlights the need to build resilience and to incorporate climate actions into national policies. The promotion of sustainable investment in sustainable infrastructure, renewable energy, and adaptation to climate change are seen as critical for these objectives and are supported by green finance (Bakhsh et al., 2024).

Green Finance and Sustainable Development Goals

Empirical studies have shown that green finance and sustainable development have a positive correlation in previous studies. Mahmood et al. (2024) suggested that green finance can facilitate green innovation and investment in renewable energy, thereby fostering environmental quality and sustainable economic growth. Moreover, the OECD (2023) pointed out that sustainable financial systems contribute to SDGs related to climate change by facilitating the flow of capital to build a low-carbon economy. However, existing studies are mostly based on cross-country or developed country evidence and empirical studies on Pakistan are lacking (Waqas & Khan, 2024; Ali et al., 2024). Hence, it is advisable to investigate further in the context of Pakistan.

2.4 Green Finance and Climate Risk Mitigation

The existing literature shows that green finance plays a vital role in addressing climate risks, being used for funding renewable energy projects, resilient infrastructure, and measures aimed at saving the environment (UNEP, 2023; Qadri et al., 2023). The World Bank (2022) also highlighted that climate change resilient investment in vulnerable economies like Pakistan brings better resilience to climate-related disasters. Despite the significant role of green finance in climate risk mitigation, Pakistan has faced limited empirical studies on the direct link between green finance and climate risk mitigation, posing an important research gap (Nasir et al., 2024).

2.5 Climate Risk Mitigation and Sustainable Development Goals

The benefits of climate risk mitigation are recognized to bolster sustainable development through protecting ecosystems, bolstering economic resilience and supporting climate-related SDGs as highlighted in previous studies (IPCC, 2023; UN DESA, 2023). Mitigation strategies are effective measures that minimize environmental damage and enhance sustainable living and economic sustainability (Nabi et al., 2025). However, the link between green finance and sustainable development goals is still quite under-explored and the role of climate risk mitigation in this context has been less explored, especially in developing countries like Pakistan (Ali et al., 2024).

2.6 Summary of Literature and Research Gap

Research shows that green finance helps with environmental sustainability and plays a role in reaching the SDGs through investment in climate-smart projects and investments and in building climate resilience. While earlier research has identified positive links among green finance, climate risk mitigation and sustainable development, there is a lack of research in this area in the case of Pakistan (Waqas & Khan, 2024;

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Rahim et al., 2025). Furthermore, there are very few studies so far that have analysed climate risk mitigation as a mediator between green finance and the Sustainable Development Goals (SDGs) (Krastev & Krasteva-Hristova, 2024). Hence, this study aims to fill these gaps and examines the intermediary role of climate risk mitigation between green finance and sustainable development goals in the context of Pakistan.

2.7 Conceptual Framework

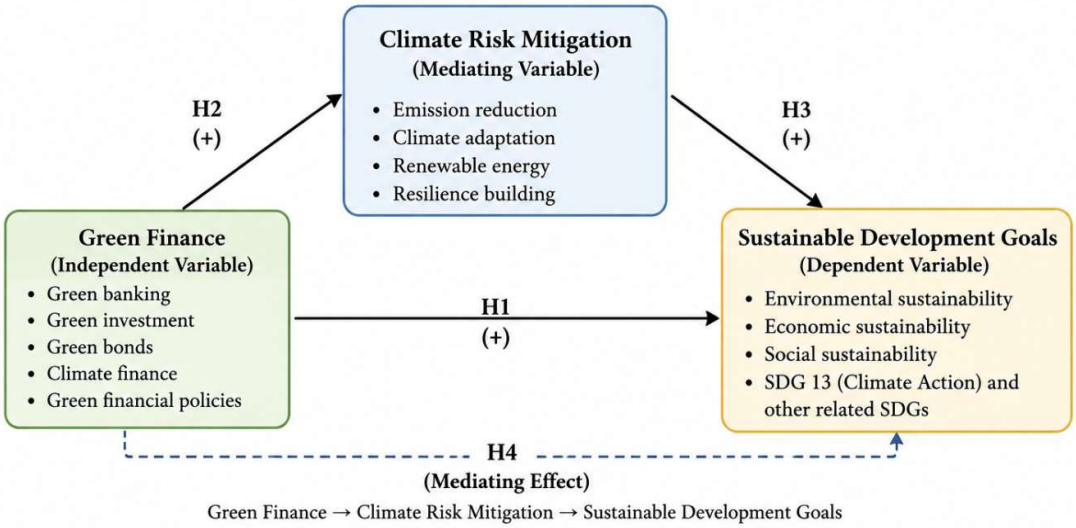
The conceptual framework for this study is designed to explores the interlinkages between green finance, climate risk mitigation and Sustainable Development Goals (SDGs) in the Pakistani context. Green finance is conceptualised as the independent variable which covers financial instruments, policies and financing techniques that facilitate the funding of environmental projects, such as green banking, green bonds, financing of renewables, climate finance and other green investments (Maqbool, 2026). These financial mechanisms enable transition towards low carbon and climate-resilient economy and sustainable economic growth (Faheem et al, 2024).

Climate risk mitigation is suggested as a mediator variable, which helps to understand the role of green finance in the relationship between sustainable development and climate risk reduction. Green financial programs promote investments in green energy, climate change adaptation, energy-efficient technologies, and resilient infrastructure, which helps to decrease greenhouse gas emissions, environmental degradation, and climate change risks (Ansari et al., 2024; Fatima, 2026). Therefore, the positive impact of green finance on sustainable development outcomes (SDO) is anticipated to be enhanced by effective climate risk mitigation. The Sustainable Development Goals (SDGs), especially environmental sustainability, climate action, inclusive economic growth and social well-being are the dependent variables. The proposed framework assumes that green finance has an immediate positive impact on the attainment of the SDGs and also an indirect impact through climate risk mitigation (Faheem et al., 2024). Therefore, this study aims to analyse how green finance affects sustainable development via climate risk mitigation and how it is likely to impact environmental resilience and sustainable development.

Based on this, the proposed conceptual framework includes one independent variable (Green Finance), one intervening variable (Climate Risk Mitigation) and one dependent variable (Sustainable Development Goals), as shown in Figure 1. This framework will give a theoretical support and will be used to empirically analyse the direct and indirect relationships among the variables of the study in Pakistan.

Figure 1

Proposed Conceptual Framework of the Relationship between Green Finance, Climate Risk Mitigation, and Sustainable Development Goals.



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2.8 Hypotheses

H1: Green finance has a significant positive effect on Sustainable Development Goals.

H2: Green finance has a significant positive effect on climate risk mitigation.

H3: Climate risk mitigation has a significant positive effect on Sustainable Development Goals.

H4: Climate risk mitigation mediates the relationship between green finance and Sustainable Development Goals.

3. Research Methodology

3.1 Research Philosophy

The paradigm used in this research was positivist research paradigm which implies that knowledge is developed by observing things objectively, by presenting facts, and by analysing the facts statistically. The positivist paradigm was suitable as the research is based on test hypothesis related to the relationships between green finance, climate risk mitigation and Sustainable Development Goals (SDGs) by quantitative data. This approach allowed the gathering of measurable data and objective interpretation of research findings (Saunders et al., 2012).

3.2 Research Approach

This study used a deductive research method, where hypotheses were formulated from theories and empirical articles developed and then tested with quantitative data. The deductive method was appropriate as it helped in the validation of the conceptual framework, and it helped the analysis of causal relationship between the variables of the study (Saunders et al., 2012).

3.3 Research Design

The quantitative research design was employed which was a cross-sectional survey. The choice of the quantitative approach was due to the fact that quantitative approach provides statistical examination of the relationship between variables, and the cross-sectional design was used so that data could be obtained at one time only and was suitable for examining the proposed research model (Hair et al., 2014).

3.4 Population

The employees of commercial banks, Islamic banks, development finance institutions, and government entities related to green finance and climate policy in Pakistan made up the target population. The study was conducted with the employees of these institutions, since they are best suited to being the respondents for the study due to their role in implementing green financial initiatives and climate related policies.

3.5 Sampling Technique

Stratified random sampling technique was used to get proportional representation from each institutional category. This sampling technique increased the representation of the sample, and reduced sampling bias by giving everyone from the various organizations an equal chance of being selected for the study (Saunders et al., 2012).

3.6 Sample Size

There was a total of 350 respondents to the study. The number of samples selected was found to be sufficient for the Partial Least Squares Structural Equation Modelling (PLS-SEM) and met the suggested minimum sample size for testing complex structural models (Hair et al., 2014).

3.7 Data Collection Method

The data was collected from the primary sources, using a self-administered structured questionnaire. The questionnaire was sent to the employees of the selected organisations and they were asked to fill the questionnaire themselves. It was deemed appropriate as it would allow for efficient data collection, standardized responses and improved reliability of the data collected.

3.8 Research Instrument

The research tool developed was comprised of four parts. Demographic data such as the gender, age, education, work experience and organizational type of the respondents was gathered in Section A. The three sections consisting of Section B: Green Finance, Section C: Climate Risk Mitigation and Section D:

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Sustainable Development Goals (SDGs) were evaluated. The measurement items were based on previously validated studies but were adapted to meet the purpose of the current study and the situation.

3.9 Measurement Scale

Each of the construct items was assessed on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The Likert scale was chosen because this is a reliable and accepted scale for quantitative research studies to assess the perception, attitude and opinion of the respondents.

3.10 Data Analysis

Data collected were analysed with SPSS version 29 and SmartPLS version 4. Demographic analysis, descriptive statistics and model evaluation of measurement and structural models were conducted using SPSS and SmartPLS, respectively. The degree of reliability was evaluated using Cronbach's alpha and Composite Reliability (CR) while convergent and discriminant validity was evaluated using Average Variance Extracted (AVE) and Heterotrait–Monotrait (HTMT) ratio, respectively. A method of partial least squares structural equation modelling (PLS-SEM) was used to test the proposed hypotheses. Also, the importance of the structural relationship was evaluated by the bootstrapping method with 5000 resampling, and a mediation analysis was performed to test the mediation of Climate Risk Mitigation between Green Finance and Sustainable Development Goals (SDEGs) (Hair et al., 2014).

3.11 Ethical Considerations

The ethical issues were carefully adhered to during the research process. The study was done voluntarily, and informed consent was taken from all respondents prior to the study. The respondents were assured anonymity and confidentiality of their responses, and about the use of the information that was collected, it would be for academic research only. In addition, participants were told that they can withdraw from the study at any time without their obligation or penalty. All the requirements of social science research were followed to maintain the integrity and credibility of the research process in the study.

4. Results

4.1 Demographic Profile

Table 1

Combined Demographic Profile of Respondents (N = 350)

Demographic Variable	Category	Frequency (n)	Percent (%)
Gender	Male	218	62.3
	Female	132	37.7
Age (Years)	21–30	78	22.3
	31–40	146	41.7
	41–50	91	26.0
	Above 50	35	10.0
Qualification	Bachelor's	82	23.4
	Master's	186	53.1
	MPhil/MS	61	17.4
	PhD	21	6.0
Experience	Less than 5 Years	73	20.9
	5–10 Years	129	36.9
	11–15 Years	91	26.0
	Above 15 Years	57	16.3
Organization	Commercial Banks	132	37.7
	Islamic Banks	96	27.4
	DFIs	47	13.4
	Government Organizations	75	21.4

The demographic profile of the 350 respondents reveals a sample that is predominantly male (62.3%) and concentrated in the 31–40 age bracket (41.7%), indicating that mid-career professionals form the

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backbone of this study. In terms of education, the respondents are notably well-qualified: over three-quarters (76.5%) hold postgraduate degrees, with a Master's degree being the most common qualification (53.1%). This high educational attainment, combined with the fact that the largest group (41.7%) falls into the prime working-age range, suggests that the participants possess sufficient academic knowledge and professional maturity to provide informed and reliable perspectives on green finance practices.

Regarding professional background, the majority of respondents have moderate to substantial work experience, with 36.9% having 5–10 years and another 26.0% having 11–15 years of tenure, ensuring a strong practical grounding in financial and organizational operations. The organizational distribution is diverse, with the largest share coming from Commercial Banks (37.7%), followed by Islamic Banks (27.4%), Government Organizations (21.4%), and Development Financial Institutions (13.4%). This cross-sectoral representation—spanning conventional banking, Islamic finance, public sector, and development institutions—enhances the robustness and generalizability of the study's findings, as it captures a comprehensive view of the green finance landscape across Pakistan's varied financial ecosystem.

Descriptive Statistics

Table 2

Descriptive Statistics

Variable	Mean	SD
Green Finance	4.08	0.58
Climate Risk Mitigation	3.94	0.61
Sustainable Development Goals	4.12	0.56

Overall, the descriptive statistics show that the respondents shared a positive attitude regarding Green Finance (M = 4.08), Climate Risk Mitigation (M = 3.94) and Sustainable Development Goals (M = 4.12). The relatively small standard deviations mean that there was a uniformity in the perception of the respondents.

Reliability and Validity Analysis

Table 3

Reliability and Convergent Validity

Construct	Cronbach Alpha	Composite Reliability	AVE
Green Finance	0.917	0.934	0.702
Climate Risk Mitigation	0.903	0.926	0.678
Sustainable Development Goals	0.926	0.942	0.731

The internal consistency is also satisfactory, with all Cronbach's Alpha values above 0.70. The composite reliability (CR) values are equal to or higher than the recommended value of 0.70 and the AVE values are higher than the recommended value of 0.50, which suggests satisfactory convergent validity.

Table 4

HTMT Ratio

Constructs	GF	CRM	SDGs
Green Finance	—		
Climate Risk Mitigation	0.664	—	
Sustainable Development Goals	0.701	0.745	—

All HTMT values are below the recommended threshold of 0.85, demonstrating satisfactory discriminant validity among the study constructs.

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4.2 Hypothesis Testing

Table 5

Direct Effects

Hypothesis	Relationship	β	t	p	Decision
H1	Green Finance → SDGs	0.452	8.915	0.000	Supported
H2	Green Finance → Climate Risk Mitigation	0.614	13.284	0.000	Supported
H3	Climate Risk Mitigation → SDGs	0.371	7.648	0.000	Supported

The impact of Green Finance on Sustainable Development Goals (SDGs) is positive and significant (β = 0.452, p < .001), which supports H1. Green Finance also had a significant impact on Climate Risk Mitigation (β = 0.614, p < .001) so as to support H2. In addition, Climate Risk Mitigation is significantly related to Sustainable Development Goals (β = 0.371, p < .001), which relates to H3.

4.3 Mediation Analysis

Table 6

Mediation Results

Hypothesis	Indirect Relationship	β	T	P	Decision
H4	GF → CRM → SDGs	0.228	6.483	0.000	Supported

The indirect effect of Green Finance on Sustainable Development Goals via Climate Risk Mitigation is statistically significant (p < .001, β = 0.228, t = 6.483). The results confirm that Green Finance partially mediates the relationship with Sustainable Development Goals. The findings indicate that green finance investments have positive direct and indirect impacts on sustainable development through supporting climate risk mitigation strategies.

Hypotheses Summary

Hypothesis	Statement	Decision
H1	Green Finance positively influences Sustainable Development Goals.	Supported
H2	Green Finance positively influences Climate Risk Mitigation.	Supported
H3	Climate Risk Mitigation positively influences Sustainable Development Goals.	Supported
H4	Climate Risk Mitigation mediates the relationship between Green Finance and Sustainable Development Goals.	Supported

The summary of the hypothesis testing results is shown in table 11. The four study hypotheses were all confirmed with evidence suggesting high levels of support of the study's conceptual framework. The results show that there is a strong positive relationship between the variables of Green Finance and Sustainable Development Goals (H1) and Climate Risk Mitigation (H2). Furthermore, Climate Risk Mitigation was found to have a positive impact on Sustainable Development Goals (H3), highlighting its role in promoting sustainable development. The results also validate Climate Risk Mitigation as a mediator between Green Finance and SDGs, suggesting that the influence of Green Finance on SDGs can be mediated by a positive effect on Climate Risk Mitigation.

5. Discussion

The results show that green finance is positively associated with achieving SDGs in Pakistan (β = 0.452, p < .001), meaning investments in sustainable financial practices also help to foster sustainable development in the country. The results indicate that there is a synergy between the implementation of green financial mechanisms, such as green banking, financing for renewable energy and sustainable investment policies and climate action and inclusive development. This finding aligns with the previous studies that have found that green finance can help to advance sustainable infrastructure, green innovation, and long-term economic sustainability (Mahmood et al., 2024; Bakhsh et al., 2024; Chaudhry & Hussain, 2023).

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The research also found that green finance has a positive impact on climate risk mitigation ($\beta = 0.614$, $p < .001$). The discovery suggests that improved funding to renewable energies, climate-smart infrastructure, and eco-friendly initiatives boosts Pakistan's ability to mitigate climate-related risks. Good green financial policies are thus essential to enhance adaptation and minimize environmental vulnerability. The results are consistent with prior studies that focus on the link between green finance and enhancing climate resilience by financing low-carbon development and sustainable technologies (Qadri et al., 2023; Ansari et al., 2024; Fatima, 2026).

There was also a significant positive association between climate risk mitigation and SDGs ($\beta = 0.371$, $p < .001$). Minimizing climate related risks supports sustainable economic growth, environmental protection and strengthening social resilience. Mitigation strategies are implemented to ensure natural resources are protected and contribute to SDG 13 and other SDG targets. The results are aligned with IPCC (2023), Nabi et al., (2025), UN DESA (2023), which all highlighted the importance of climate resilience in sustainable development.

The mediation analysis results showed that green finance partially mediated the relationship between climate risk mitigation and SDGs ($\beta = 0.228$, $p < .001$). This means that the impact of green finance transcends its direct effects, as it also enhances climate risk mitigation efforts, having an indirect impact. Results show support for the proposed conceptual framework and that climate risk mitigation is an important mechanism connecting sustainable financial investments to SDG targets. This finding corroborates the findings of Ali et al., (2024), Krastev and Krasteva-Hristova, (2024), and Nasir et al., (2024) who noted that this mediator relationship should be explored especially in developing economies like Pakistan.

Overall, the findings are consistent with previous international and Pakistani studies reporting positive relationships among green finance, climate resilience, and sustainable development (Ali et al., 2024; Waqas & Khan, 2024; Rahim et al., 2025). This research is different from the majority of previous studies which mainly focused on the direct relationships; however, this study empirically shows that climate risk mitigation is a mediating variable between the two variables in the Pakistani context. The study therefore provides new empirical evidence by providing an explanation on how the field of ‘green finance’ can contribute to sustainable development by improving climate risk mitigation, thus filling an important gap highlighted in previous studies.

5.1 Policy Implications

The findings of this study provide important policy implications for strengthening green finance and accelerating the achievement of the Sustainable Development Goals (SDGs) in Pakistan. The Government of Pakistan should adopt more robust national green finance policies, tax measures and climate investment policies to promote sustainable economic growth and boost low carbon projects. SBP should continue to develop and refine Green Banking Guidelines and Environmental and Social Risk Management (ESRM) guidelines to promote financial institutions to increase their green lending and/or enhance sustainability reporting. The government should encourage commercial and Islamic banks to increase financing for renewable energy, energy-efficient technology, green infrastructure, and green Sukuk to foster the growth of environmentally friendly investments. Financial institutions need to incorporate climate risk assessment into their lending and investment processes, strengthen climate-related disclosure, and innovate climate-related financial products to better withstand climate-related risks. Environmental policymakers should tackle the challenge of coordinating environmental and financial policies by adopting comprehensive climate policies, effective monitoring and strengthen public-private partnerships to enhance the climate risk mitigation and sustainable development. These policy measures can work together to make Pakistan more resilient to climate change and to accelerate progress towards the SDGs.

6. Conclusion

This study examined the relationships among green finance, climate risk mitigation, and the Sustainable Development Goals (SDGs) in Pakistan. The empirical results showed that green finance has indeed a significant and positive effect on climate risk mitigation and SDG achievement. Furthermore, it was discovered that the climate risk mitigation positively contributes to sustainable development and partially

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mediating the relationship of green finance and SDGs. The study shows that sustainable financial investments have direct environmental and economic benefits, as well as the additional benefits of increased climate resilience, which increases sustainable development.

All the research objectives were met with success. It confirmed the positive effect of green finance on achievement of SDGs, showed the significant impact of green finance on climate risk mitigation and verified the mediating effect of climate risk mitigation between green finance and sustainable development in the Pakistani context.

This research is a significant addition to the body of literature on sustainable finance as it includes empirical findings from Pakistan where research on green finance is scarce. More importantly, it contributes to the literature by showing climate risk mitigation as an important mediator between green finance and SDG achievement, the former being a vital factor in sustainable finance, and the latter a critical factor in developing economy climate resilience.

Overall, the study concludes that strengthening green finance is essential for mitigating climate risks and accelerating progress toward the Sustainable Development Goals. Promoting sustainable financial policies, boosting green investments, and integrating climate risk management into financial decision-making can contribute to environmental resilience, sustainable economic growth, and a transition toward climate-resilient and sustainable development in Pakistan.

6.1 Limitations of the Study

There are a number of limitations to this study that should be recognized. First, because of the cross-sectional research design, causal relationships among the three factors, namely green finance, climate risk mitigation, and Sustainable Development Goals (SDGs), are limited. Second, data is self-reported, meaning that it can be affected by perceptions and social desirability bias by the respondents. Thirdly, the study used a limited number of financial institutions and government organizations in Pakistan, limiting the generalizability of the findings to other national contexts.

6.2 Future Research Directions

Longitudinal designs should be used in future research to study variations in these relationships over time. Triangulation of results from across the country would enhance the generalizability of the results across institutional contexts. Researchers are also encouraged to adopt mixed-method approaches to gain deeper insights and investigate additional mediating and moderating variables that may further explain the relationship between green finance and sustainable development.

Author Contributions

All authors participated in ideation, development, and writing the manuscript. All authors read and approved the final manuscript.

Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this article.

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Informed Consent

Informed consent was obtained from all participants.

Data Availability

The datasets generated during and analysed during the current study are available from the corresponding author on reasonable request.

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