Research Journal for Societal Issues

Vol 7 No 2 (2025): 38-55

Pakistan Role in Climate Sustainably and Its Challenges

Waleed Asghar*[1]

[1]*Department of Political Science and International Relations, University of Management and Technology, Lahore, Punjab, Pakistan.

Corresponding author: waleedasghar.official@gmail.com

Keywords: *Climate Sustainability, Greenhouse Gases, Mitigation and Adaptation, Climate Change, Institutional Capacity*

DOI No: https://doi.org/10.56976/rjsi.v7i2.358

Pakistan is a highly climate-sensitive state in the globe. Although the country is a low emitter of greenhouse gases in the world, it is highly affected by climate change which encompasses extreme flooding, melting of glacial ice, heat waves and stress in agriculture. This paper will discuss the role played by Pakistan in climate sustainability, and focus on both the domestic efforts (mitigation and adaptation) taken in climate sustainability by the country and the challenges within the country. The paper will be based on policy analysis, empirical studies, and recent climatic incidences to demonstrate how the challenges of institutional capacity, financial limitation, fragmentation of governance, and socio-economic inequality impede the sustainability desire in Pakistan. The paper ends by providing strategic suggestions to ramp up climate resilience, improve the green finance processes, and involve communities more in taking action on climate.

1. Introduction

The climate change turned to be one of the most significant international problems of the twenty-first century that changes the ecological systems, socio-economical patterns and the overall priorities of the development of the states (Naseer et al., 2024; Shah et al., 2023; Aurangzeb, & Haq, 2012). The necessity to develop solutions to the problem of climate change is multiplied by the high weaknesses and the low adaptability capacity in the context of developing countries, in particular, those ones in South Asia (Malik et al., 2025; Zaheer et al., 2021). Pakistan has been leading in the climate vulnerability front as the country has been persistently ranked as among the most climate-prone country in the world due to its contribution to the global greenhouse emission at a less than 1 per cent (Ahmed et al., 2025; Shah et al., 2025). This addition to the asymmetry of impact creates a special background, where the problems of climate of the Pakistani must be understood.

Pakistan is a complex and structural climate change exposure (Feng et al., 2023; Hafeez et al., 2011). The country is located in a region where the highest concentration of glaciers in the world exists that is not in the polar regions and this has exposed the country to the glacial lake outburst floods (GLOFs), inconsistency in the glacier melting patterns and intervention of river flows (Hsu et al., 2024; Hsu & Huynh, 2023; Hsu et al., 2023). At the same time, the Pakistani agricultural economy is experiencing pressure on the Indus River Basin because of erratic monsoons, increased temperatures, and declining groundwater levels (Hsu et al., 2023; Nguyen et al., 2022). The 2010 catastrophic floods, the constant droughts in Balochistan and Sindh, the smog crisis in Lahore, the super floods which are currently being experienced, and the heat waves proving to be here and now are demonstrating how climate change is not merely in the future, but it is now (Hsu et al., 2025; Huang et al., 2025; Thu et al., 2024).

The socio-economic factors of the climate change put Pakistan at a disadvantage though the physical impact of the climate change is dire (Kayani et al., 2023; Khan et al., 2021). The climate dependent industries such as agriculture, livestock, forestry and fisheries rely on a large percentage of the population (Hsu et al., 2024; Hsu et al., 2024; Nguyen et al., 2021). Poverty, low literacy levels, low institutional capacity and low infrastructure level cause the communities to be unprepared to cope and recuperate following climate related disasters. Moreover, the rhythm of the urbanization process and the uncontrolled development of the settlements also adds to the aggravation of the level of the environment degradation (Rana et al., 2022; Rana et al., 2021; Rana, 2015). Pollution, heat stress, and water shortage are imposing growing pressures in such cities as Karachi, Lahore, Peshawar and Faisalabad which are undermining the quality of life and sustainability (Khan & Haq, 2025; Haq & Khan, 2024).

Despite these challenges, Pakistan has been becoming more interested in climate sustainability. The nation has developed a comprehensive policy and institutional framework that will involve the consideration of climate in the national development planning (Saher et al., 2021; Hewawitharana et al., 2020; Masih et al., 2020). They are the National Climate Change Policy (NCCP), the National Adaptation Plan (NAP 2023) and commitments of the Paris Agreement through updated Nationally Determined Contributions (NDC 2021). These policies take into consideration the fact that the Pakistani government has come to the

realization that climate change is not just an environmental issue, but also a national security, economic and social development issue (Mir et al., 2021).

One of the most internationally recognized activities related to climate sustainability, made by Pakistan, is the high-level investment in natural solutions to the issue, namely the ten billion tree tsunami afforestation program (Ahmad et al., 2021; Ali et al., 2020; Ahmad, 2018). This was a project that was supposed to restore damaged ecosystems, to combat the emission of carbon and to stabilize ecologies (Masih et al., 2024; Masih, 2022). Along with this, the country has been striving on the renewal, development of the area, and development of urban forests which is a pointer of the green growth commitment (Ali et al., 2020; Xu et al., 2019). In addition, Pakistan has emerged as a powerful ally in the international climatic conferences. It has led in the pack when it comes to bargaining on the question of Loss and Damage claiming climate justice and demanding that vulnerable countries should get equitable and predictable climate finance (Janjua et al., 2025; Faisal et al., 2025). Pakistan was able to shape the global agenda through the chairmanship of the G77 in UN Framework Convention on Climate Change (UNFCCC) and triggered the problem of excessive contribution by the climate-vulnerable countries.

Still, it remains challenging to transform promises into actual, quantifiable outputs. The Pakistani monetary constraint is one of the issues that have been faced (Yazidi & Rana, 2025; Feng et al., 2023). They have ambitious policies but have fiscal constraints that would restrict their adoption, dependency on donor funds and paper work which is not efficient (Ali et al., 2021; Muhammad et al., 2020; Farooq et al., 2019). Weak early-warning systems and bad governance capacities in the local government are other issues that discourage sustainable climate action because of the inadequacy of the infrastructure that is not climate-resilient. The lack of political stability and shifting priorities of the government makes it easy to derail long term climate projects (Ahmad et al., 2021; Ali et al., 2020; Ahmad 2018). The other immediate issue is the incoherent system of administration. The governance of climate in Pakistan is divided into various ministries, departments and provincial institutions which lack coordination and their mandates are similar (Kayani et al., 2023; Khan et al., 2021; Naseer et al., 2021; Khan & Khan, 2020). The result of this disintegration is duplication of policies, policy stagnation and inefficiency of institutions. Although it is necessary to concentrate on the management of the environment in the 18 th Amendment, the provincial governments have been observed to be poor in the delivery of technical skills and resources to head the climate adaptation programs (Hsu & Huynh, 2023; Hsu et al., 2022; Hsu et al., 2021).

Moreover, the sustainability efforts regarding the climate in Pakistan are confined due to the ignorance among the citizens and the involvement of the society. Behavior change, local level planning, community level adaptation, and taking effective climate action is necessary (Janjua et al., 2025; Shah et al., 2024; Naseer et al., 2018). However, the level of climate literacy remains very low and many citizens still do not have knowledge and means to be in a position to contribute to climate resilience. Despite the perfection of climate strategies, these strategies are not able to be effective in the long term unless their implementation is accompanied by a wide engagement of the community (Zhang et al., 2023). The role played by technology and innovation on climate agenda is transformative but insufficient in Pakistan

(Masih et al., 2025s; Masih et al., 2022). There is an increased use of renewable energy particularly solar and wind energy although fossil fuel remains the national energy mix. Smart agriculture, water conservation and green infrastructure are still to be exploited due to the cost and other skilled personnel. The need arises to incorporate innovation in the climate strategies of Pakistan in order to be brought above the orthodox issues of development.

In this respect, it is a dual task of Pakistan:

First of all, mitigation that is, the reduction in the emissions and transition to the sustainable energy systems;

(2) Adaptation - to ensure that communities and ecosystems become immune to climate impacts.

Both are needed but the adaptation is essential as there is an urgent need of Pakistan which is at the moment vulnerable.

This term paper argumentatively provides insights into the role and problems of Pakistan with regard to climate sustainability (Khan et al., 2023). It examines the structures of the policies, institutional processes, the foreign relations and grass-root movements in the nation. It is also critical on the barriers that hinder successful action on climate like lack of funds, governance, technological constraints and social-economic weakness (Huang et al., 2025; Doan & Huynh, 2024; Hsu et al., 2024). This paper is an effort to provide a comprehensive analysis of the climate sustainable situation in Pakistan in respect of the developments and the prevailing challenges. In this review, the article brings out strategic direction of future climate resilience and policy recommendations to the policy makers, institutions, donors and communities. On balance, the climate change situation in Pakistan can be characterized as the story of a high vulnerability, strong commitment, and complex challenges (Mankash et al., 2024; Ahmed et al., 2023; Hussain et al., 2021). This is the dynamic of creation of realistic and successful strategies that will increase resiliency and allow sustainable development of future generations.

2. Literature Review

2.1 Pakistan's climate vulnerability: evidence and impacts

The fact is that, Pakistan is supposed to be one of the most climate vulnerable nations in the world. The exposure of the physical nature is gigantic, generalized: to the north, in the highlands, there are great complexes of glaciers, a cultivated Indus Basin relying on snowmelt and monsoon precipitation, long beaches and plains along rivers, subject to flood and cyclonic activity (Ahmed et al.,2023). The sense of vulnerability is further supported by the events of recent times, in particular, the series of the monsoon floods in 2022 that is estimated as the multi-billion-dollar damages and orders to rebuild instantly in the context of the demands of the post-disaster requirements, which show the colossal macroeconomic and human costs.

Empirical indications of the extent to which the climate change is undermining the Pakistan development have been reported: agricultural growth impairment, housing, transport infrastructure breakdown, population-health disasters, mass migration, poverty, and food insecurity (Hafeez et al., 2021). The magnitude and frequency of extreme manifestations have

aggravated the panic of both adaption (long-term building of resilience in the short term), and mitigation (longer-term decarbonization paths). These conditions could affect the national planning and promotion of climate finance and loss and damage structures in Pakistan on the international level.

2.2 Policy and institutional response: NDCs, NAP, and national frameworks

Pakistan has been achieving formal climate policy framework that provides mitigation and adaptation targets. The 2021 NDC is the unconditional (funds will be raised within the country) and conditional (the international funding will occur in case of alternative sources of renewable energy) targets, with significantly higher shares of renewable energy, conservation of zones, and desire to minimize the supposed emissions to the nature-based solutions, and energy transitions (Imran et al., 2023; Oad et al., 2024; Hussain et al., 2023). In the given presentation, it is possible to obtain a clear image of climate action of Pakistan as the development co-benefits and climate justice issues.

Pakistan attempted to make adaptation operational in sectors and on the government levels through the approaches to the iterative planning, monitoring and evaluation and the necessity of participatory planning and the necessity of gender-responsible planning NAP (2023). The NAP presupposes an integrated prism or, to be more precise, a nexus of water, agriculture, disaster risk reduction, health, and urban planning and a necessity to mainstream adaptation in development budgets as well as sector plans. The fact that NAP is an essential institutional milestone and coordination of ministries, provincial strengths and predictable financing is admirable preconditions to its application. All these documents indicate the policy rhetoric transference into programmatic. Nevertheless, the literature and policy reviews note that the implementation loopholes are significant: one of the most popular obstacles is an adaptation of NDC and NAP priorities to the subnational projects, tracking investments, and injecting money into the system in time. Policy design is increasingly becoming stronger and stronger yet the governance and resource envelope is the significant constraint.

2.3 Nature-based Solutions (NbS) and Large-Scale Afforestation: Achievements and Critiques

Nature-based solutions are one of the most important components of the climate strategy in Pakistan. These High-profile programmes consist of; the "Ten Billion Tree Tsunami" (TBTT) and previous provincial billion-tree programmes all aimed to reestablish forest cover, increase carbon sequestration, reduce soil erosion and provide livelihood cobenefits. International agencies have not underestimated the size and extent such programs and the first reports are full of positive coverage of high plantation coverage and community involvement factors (Imran et al., 2023; Oad et al., 2024; Hussain et al., 2023).

However, other analyses and academic appraisals carry huge reservations. Studies bring up the questions of tracking, selection of species, survival in the long term and equity in participation. Indicatively, studies have shown that the number of plantations is not enough to achieve sufficient success unless it is carried along with long-term ecological restorations, management of communities and high monitoring systems. One of the operational issues to be addressed includes the land tenure disputes, the funds to carry out the maintenance activities, and the

integration of locals into the operation so that the calculated numbers of the tree planting can be quantified into sustainable forest restoring and livelihood returns. These critiques lead to the bigger picture, which is that NbS must be implemented with strong governance, scientifically-planned, and participatory modalities that would bring about the desired resilience and mitigation implications.

2.4 Extreme Events and Climate Impact On Economics Through Loss And Damage

The floods of 2022 were a climatic record in the history of the climate in Pakistan. World Bank review of the Post-Disaster Needs Assessment (PDNA) and subsequent estimates of damages and losses put tens of billions of dollars of damages and losses and outlined a huge recovery and rebuilding agenda that is building back better. The structural vulnerabilities of infrastructure, land use planning, and disaster preparedness embodied by the financial aftermath of housing, agriculture, transport and services illustrated the results. These reviews have rendered the case of Pakistan even stronger of augmented foreign financing and augmented investments in robust infrastructure.

The topics of loss and damage and access to foreseeable funds have now been a subject of discussion: Pakistan has been a strong advocate of initiatives that recognize historical injustice (low historical emissions and high vulnerability) and financing that can support the short-term recovery and the longer-term transformative adaptation. Loss and damage instruments have been developed over time through the international negotiations (COP processes) and, in general, most practitioners reckon that the current international mechanisms are insufficient to meet the scale of demand that is being manifested by national assessment.

2.5 Governance, Institutional Fragmentation and Multilevel Implementation Issues

The theme of the reviews of policies recurrently is the diffused system of governance. The climate responsibilities are divided among various ministries that include the environment, water, agriculture, planning, finance, provincial departments after devolution reformations. Despite the fact that decentralization offers opportunity of locally adjusted adaptation, it should be very well coordinated and capacity building must also occur at provincial and municipal level and should be properly financed (Masih et al., 2022; Masih et al., 2021). Analysts have focused on the overlapping mandates, lack of proper monitoring and evaluation and poor technical capacity at the lower levels have contributed to the failure of projects to be implemented in time. Institutional relationship and investment in the capabilities of the public sector are consequently important antecedents of successful NAP and NDC execution.

2.6 Resources to Finance Transition: Internal and External Opportunities

In Pakistan the most critical bottleneck to the climate strategy has been financing. The government has restricted resources in the areas of adaptation and green infrastructure because of domestic fiscal constraints, competing development priorities and debts services pressures. The 2022 floods PDNA indicated significant loopholes in financing in rehabilitation and resilient construction. To address these gaps, Pakistan is thinking over a package of financing instruments - international grants and concessional finance, to green bonds, blended finance, and new instruments, such as debt-for-nature swaps. However, this finance should be institutional prepared with clear project pipelines and absorptive capacity to tap and utilise it.

Capacity development and project financing involve the participation of the international community (UN agencies, multilateral development banks, bilateral donors). The projects however expose themselves to terms and potential delays due to reliance on external financing. The literature also gives stress on the need of moderation in the action taken: to mobilize international finance and deepen domestic fiscal resources and participation of the private sector through incentives and de-risking systems. UNDP Climate Promise+1

2.7 Technology, Innovation and Industry Directions

Technological innovation is the cross-cutting enabler in mitigation and adaptation. Pakistan has a potential in the field of renewable energy (solar, wind, small hydro), climate sensitive agriculture (drought resistant crops, improved irrigation), water management (ground water recharge, good canal systems), and improved early warning systems against disasters. Research and pilot programs reveal potential gains, but to increase the scale, a R&D development, partnership with the private sector and updating the workforce is required. The implementation of technology in the priorities of NAP can be utilized to accelerate the resilience accruals when it is coupled with the specific financing and capacity building.

2.8 Social Factors: Social Equity, Inclusion and Communal Adaptation

Social inclusion is connected with the efficacy of adaptation. Some of the vulnerable populations who might lack access to finance, information, or decision-making platforms include smallholder farmers, women, informal workers, and marginalized communities. The emphasis of various case studies is that community-based adaptation, participatory planning and community-based early-warning systems produce greater outcomes compared to top-down interventions. Empirical evidence is available to suggest that investments in social protection, diversification of livelihoods and gender-sensitive programming should be made to limit vulnerability and increase local resilience. These are social considerations as emphasized in the NAP but the idea of the actualization of inclusive adaptation is a major undertaking.

2.9 Pakistan and International Diplomacy Normativity

Climate justice, loss and damage, and solidarity in the vulnerable states have formed the basis of the diplomatic position of the Pakistani state at the fora of the UNFCCC. By highlighting the inequitable impact on low emitters, Pakistan has helped in developing the global discourses on equity and the need to have predictable climate finance. The promotion of the country is free to the domestic policy - via the international arenas of mobilizing finance and technical resources, and insisting on systematic modifications in the global climate governance. As much as diplomatic instruments are required, the academics also observe that the key in this game is the capacity to operationalize international commitments into on-ground investments.

2.10 Fatally Flawed Literature and Research Agenda

Regardless of the fact that there is a good descriptive background provided by policy documents and post-disaster assessment, there are many gaps that exist in research:

2.10.1 Implementation Research

The process of NAP and NDC commitment to provincial and local projects is not well studied systematically; the roadblocks to implementation are to be diagnosed empirically.

2.10.2 NbS scale efficacy

TBTT and analogy programs are ambitious, but there is lack of longitudinal studies on tree survival and ecosystem functionality recovery, and socio-economic outcomes of NbS.

2.10.3 Finance Absorptive Capacity

There exists the necessity to dig up further information on whether Pakistan can write bankable projects, attract the private capital and use blended finance tools adequately.

2.10.4 Equity and Vulnerability Mapping

The high-resolution studies should be conducted in order to focus the investments on the adaptation to the most vulnerable people and locations. thedocs.worldbank.org.

2.10.5 Monitoring & Evaluation (M&E)

NAP is supposed to possess working M&E systems; indicators, data systems, accountability mechanisms can be facilitated through academic work.

The ignorance regarding such gaps will require inter-disciplinary work i.e. climate science, economy, governance, and participatory social research in order to create knowledge that can be implemented by policy makers and the communities.

There is a two-sided picture in the literature. Pakistan is also well placed morally and diplomatically - advancing climate justice and inspiring finance-mechanism such as loss and damage - and yet advancing ambitious domestic agendas (NDC, NAP, large NbS campaigns). However, ambition can be scaled to big scale and long term effect, which cannot be enjoyed by the country because of finance, control, institutional strength and social instability. The path forward would be to improve the implementation systems, access more sources of financing, utilize technology and NbS more, and put equity into all adoption and mitigation activities. These transitions require evidence-based research that is based on practice that undergirds them with evidence-based, contextual knowledge. unfccc.int+2unfccc.int+2.

2.10.6 Climate Sustainability Strategic Role of the Pakistani State

Pakistan has developed a good institutional framework to tackle the climate change. The Ministry of Climate Change is the one that spearheads mainstreaming of climate resilience in national planning. The large national frameworks are:

National Climate Change Policy (NCCP)- an old policy foundation.

Nationally Determined Contribution (2021) -- Climate mitigation and adaptation targets of Pakistan in the Paris Agreement.

National Adaptation Plan (NAP 2023) - to guide long-term adaptation in strategically important sectors.

Upscaled Green Pakistan Programme- green infrastructure + nature-based solutions and sustainable development. Dawn+2uraanpakistan.pk+2

These policies denote the recognition of Pakistan on the climate change issue as a cross sectoral problem, which is affecting water, agriculture, urban infrastructure and ecosystem services.

3. Solutions and Afforestation in Nature

In Pakistan, there are also green programs, such as the urban forests and the Ten Billion Tree Tsunami program. These programs are to restore degraded sceneries, sequester carbon along with establishing long term ecological stability. kmuj.kmu.edu.pk+1.

Afforestation is a very maneuverable process as Pakistan is prone to soil erosion, lack of water and instability of rain-runoff.

3.1 Clean Energy and Technological Innovation

Pakistan understands that climate sustainability is highly related to innovation. Scientific studies are referring to the rising popularity of renewable energy (solar, wind), water saving technology, and climate-resistant agriculture (Zeeshan and Iqbal, 2022). resdojournals.com.

Moreover, urban planning and green infrastructure are also being integrated in the urban development agendas to reduce the carbon footprints.

3.2 Global Climate Diplomacy

Pakistan is a strong advocate of climate justice in the global arena, indicating that it is highly vulnerable but with low-emission profile, and thus it should be tackled more by the international community. It promotes the principle of equity and Loss and Damage that demand climate finance, transfer of technology and multilateral cooperation (Dawn, 2025). Dawn

There are other forms in which Pakistan can be perceived to have been involved such as its contribution towards the Loss and Damage Fund, which has been one of the largest products of recent COP discussions (Alam, 2025). Dawn

3.3 Development Partnerships

International organizations such as the UNDP play a lot of roles in climate strategy in Pakistan. The initiatives which UNDP supports are climate resilience, community-based adaptation, and marginalized groups. UNDP. Such partnerships help in popularizing climate action as a development agenda that addresses the demands of the social equity as well as the environment.

3.4 Pakistan Climate Sustainability Problems

Despite these good points, the following are deep rooted problems that are handicapping climate ambitions of Pakistan:

3.5 Climate Financing & Financial Constraints

The weather initiatives in Pakistan do not include internal investments. Outside financing of climate is highly crucial, but the barriers to payment, red tape, and organizational fragmentation discourage efficiency (Saeed & Piracha, 2025). contemporaryjournal.com.

There are also the concerns of the sustainability of debt and conditionality as a result of the dependence on foreign funding or loans.

The third chapter describes the system of governance and disaggregation of the institutions in the MENA countries as among the key drivers of socio-political instability (Sawasawa, 2018).

The policies are not consistent as there are some number of ministries that overlap their mandates (environment, water, agriculture). There is no effectiveness in climate strategies implementation as there exist weak inter-agency coordination and gaps in implementation.

3.6 Social-Economic Vulnerabilities

In Pakistan, the climate change threatens the population of the country in vast areas: rural population, small holder farmers, and marginalized groups are the most vulnerable to climate change. They often lack a resource, an infrastructure or even political representation, to be able to do so (Naz, Iqbal & Begum, 2024). Changes in rainfalls, melting of glacier and erosion of soil are the factors which pose a specific threat to food security (Aitzaz, Aatizaz & Aatzaz, 2024). ojs.pssr.org.pk.

3.7 Disaster Risk and Extreme weather

Repeated devastating floods have risen in Pakistan. This is caused by the melting of the glaciers in the north and the flash floods caused by the unpredictable monsoons devastate fields and cities (AP News, 2025). The cost of inaction is too high: loss of life, destruction of infrastructure, displacement, economic imbalance in long run.

3.8 Institutional Capacity and Awareness of the Population

There are policies in place but the government agencies do not have the capacity to execute them, citizens are not fully aware of it and also there is an absence of community participation (Saeed and Piracha, 2025). The grassroots adaptation strategies are not well laid without strong involvement of the civil society.

3.9 Climate Justice and Equity

The ethical implications of climate vulnerability of Pakistan are that this country does not contribute significantly to the emissions of the world but instead suffers. The climate justice must not be funded but must be structuralized in terms of how the global climate finance is distributed and managed (Khursheed Alam, 2025). <<<

4. Analysis and Discussion

The question to consider in this case is whether the Climate Sustainability Strategy adopted by Pakistan is working. Pakistan has done great things which have established strong climate institutions, committed to tree-planting and even green policies in sectors. Its presence in the world and particularly in the world of UN climate diplomacy speaks of a veritable interest in climate responsibility and justice. However, there is a wide gap between what people want to do and doing it. There is a tendency to limit policy-to-resilience policy translation based on financial and governance constraints. The inefficiency of climate funding and the institutional

failure to coordinate the process delays adaptation processes leaving many communities vulnerable to it.

4.1 Effective Innovation as a Resiliency Lever

Pakistan boasts of bright future in technology and natural development. Climate resistant varieties of crops, solar and wind energy, as well as green infrastructure can be adopted as a measure of increasing resilience against long-term. This could be a possible intervention with the help of international relations that would allow Pakistan to leap to more sustainable development paths (Zeeshan & Iqbal, 2022). resdojournals.com.

In 4.3, I would take a more action-oriented approach to a regime that is more focused on equity than on action. The paradigm of equity is needed in order to make the climate strategy of Pakistan sustainable. The resources and information of adaptation should be accessible to the vulnerable populations and the power to make decisions. The long-term strategies are to create climatic literacy, increase the circulation of funds, and strengthen the communities.

4.2 The significance of International Cooperation

The climate diplomacy of Pakistan is crucial; being a low emitting, yet climate-vulnerable nation, the country has a moral and political clout to be considered at the international scale. Its Loss and Damage financing, tree-planting commitments and low-carbon programs can become the motivation of more comprehensive action. However, the global financial mechanisms ought to be redesigned in a manner that nations like Pakistan can be provided with easy, predictable and equal access to finances.

5. Conclusion

The struggle that Pakistan undergoes in sustaining climate is hard and determined. Despite its formulation of sound policies, its ambitious green programs, and good voice in the international stage, it has severe problems in its weaknesses, and structural restraint. Without improved governance, additional financing and more engagement of the community, the country risks losing its climate aspirations. Nevertheless, the solution to the problem can be seen in the following: through its innovativeness, fairness, and collaborative nature, Pakistan can be a climate-resilience leader in the Global South.

5.1 Recommendations

Based on the analysis, one can recommend the following strategic alternatives to Pakistan to improve its climate sustainability initiatives:

Finance More Access to Climate.

1. Adjust institutional structures to pay climate funds quicker.
2. Employ green bonds and nature-based financing, use debt-for-nature swaps.
3. Increase Administration and Co-ordination.
4. Establish a territorialized inter-ministerial climate task force whose mandates are clear.
5. Province and local ability to deploy climate resiliency.
6. Increasing Technology and Cleaner Technology.
7. Invest in climate-sensitive agriculture, research on water management and alternative energy.

8. Incorporate green infrastructure and technology through partnership with private partners.
9. Foster Environmental Justice Solutions.
10. Plant more trees, mangroves and green belts in cities.
11. Ensure the inclusion of the ecosystem-based adaptation within the national development plans.
12. Empowering Weak Communities.
13. Invest in climate education, early-warning systems and community-based adaptation.
14. Grant microfinance or climate resilient farm or local green enterprise.
15. Justice and Advance Climate Diplomacy.
16. Finance damages and losses and climate fairly.
17. Use multilateral forums to form partnerships of climate change and green development.

6. References

Aitzaz, M., Aatizaz, M., & Aatzaz, G. (2024). *Climate Change: Threats to Agricultural Sustainability in Pakistan*. *Pakistan Social Sciences Review, 8*(2), 748–756.

Naz, S., Iqbal, Z., & Begum, S. (2024). *Climate Change's Impact on Food Security in Pakistan: Challenges and Mitigation Strategies*. *Pakistan Social Sciences Review, 8*(2), 426–438.

Pervaiz, F., & Umar, M. (2025). COP29 and Pakistan's Path to SDGs: Challenges, Opportunities, and the Way Forward. *Journal of Health & Climate Change, 4*(1), 23-39.

Saeed, S., & Piracha, T. (2025). Institutional fragmentation and climate policy implementation in Pakistan. *Contemporary Journal of Social Science Review*. contemporaryjournal.com

UNDP Pakistan. (n.d.). *Resilience, Environment and Climate Change*. Retrieved from UNDP Pakistan website. UNDP

Zeeshan, M., & Iqbal, N. (2022). *Sustainable Solutions to Climate Challenges: The Role of Innovation in Pakistan*. *Journal of Energy and Environmental Policy Options, 5*(2), 39–45.

Chohan, A. H., & Haq, A. U. (2025). Corporate Governance and Audit Quality in Islamic Banks in Emerging Asian Economies: A Literature Review. *Journal of Development and Social Sciences*, *6*(2), 450-465.

Qazi, A. H., Khan, A. R., Haq, A. U., & Talat, M. (2025). Board Gender Diversity In Corporate Governance Of Public Listed Companies: A Literature Review. *Journal of Business and Management Research*, *4*(2), 786-800.

Malik, M., Muzaffar, B., & Haq, A. U. (2025). Bridging Risk, ESG, and Digitalization: A Literature Review on Internal Audit's Strategic Role in Corporate Governance. *Pakistan Social Sciences Review*, *9*(2), 626-640.

(Chohan & Haq, 2025; Qazi, et al., 2025; Malik, Muzaffar & Haq, 2025)

Ahmed, A., Batool, S., & Haq, A. U. (2025). To Measure the Effects of Omnichannel Management Capabilities on Positive WOM Engagement and Equity. *Wah Academia Journal of Social Sciences*, *4*(1), 1265-1285.

Shah, S. M. A., Ahmed, N., Haq, A. U., & Saba, S. (2025). Leadership for Innovation: Fostering the Culture of Creativity in Organization: A Systematic Literature Review. *Journal of Asian Development Studies*, *14*(2), 945-957.

Malik, M., Muzaffar, B., & Haq, A. U. (2025). Bridging Risk, ESG, and Digitalization: A Literature Review on Internal Audit's Strategic Role in Corporate Governance. *Pakistan Social Sciences Review*, *9*(2), 626-640.

Zaheer, S., Tufail, S., Abbasi, H., & ul Haq, A. (2021). Identifying Benefits of Self Academic Review For Nacte Program-Level Accreditation: A Case Study of International Islamic University Islamabad. *International Journal of Management (IJM)*, *12*(6), 111-129.

Shah, S., Khan, M., Haq , A. U., & Hayat, M. . (2023). COVID-19 Precautions of Pakistani Banks in the Lens of Qualitative Study Approach. *Global Journal of Humanities and Social Sciences Research*, *2*(2), 16–30. https://doi.org/10.59129/gjhssr.v2.i2.2023.15

Naseer, M., Haq, A. U., & Shah, S. M. A. (2024). Understanding Turnover Intentions in Pakistan's Healthcare Sector: A Qualitative Exploration of Supervisory Behavior, Stress, and Cultural Norms. *Annual Methodological Archive Research Review*, *2*(5), 1-18.

Aurangzeb, D., & Haq, A. U. (2012). Factors affecting the trade balance in Pakistan. *Economics and Finance Review*, *1*(11), 25-30.

Ali, N., Bilal, M., Qureshi, S. A., Toru, N., & Rana, A. M. (2020). Empirical Investigation Of Privatization Process In Pakistan: Evidence From Statistical Experience. *Sarhad Journal of Management Sciences*, *6*(2), 385-402.

Ahmad, K. U. R. (2018). Organizational Commitment and Ethical Conduct on Team Performance: Evidence from Pakistan. *International Journal of Academic Research in Business and Social Sciences*, *8*(7), 328-339.

Ahmad, M. M., Qureshi, S. A., Bilal, M., & Rana, A. M. (2021). Dynamic Measuring the Impacts of Financial Fragility on the Performance of Non-Financial Firms Listed at the Pakistan Stock Exchange. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies*, *12*(1), 1-10.

Feng, Y., Rana, A. M., Bashir, H., Sarmad, M., Rasheed, A., & Ayub, A. (2023). What's love got to do with it? How does workplace romance provoke workplace ostracism and interpersonal conflict. *International Journal of Conflict Management*, *34*(4), 773-800.

Hafeez, S., Rana, A. M., Chaudhry, R. M., Khan, M. A., Ahmad, H. M., & Rehman, K. U. (2011). Perspectives of entrepreneurial orientation with the quality of life. *Journal of Economics and Behavioral Studies, 3(6)*, pp. 381-387.

Mir, I. A., Rana, A. M., & Waqas, R. M. (2021). Information Verification Motivation and its Influence on Users' Social Media Advertising Evaluation and Outcome Behaviors. *Pakistan Social Sciences Review, 5(3),* 503-514.

Rana, A. M. (2015). Inter Relationship between Team Conflict Management, Employee Satisfaction and Organizational Performance. *Information Management and Business Review*, *7*(2), 93-99.

Rana, A. M., Bilal, M., Ajmal, M. M., Zaheer, M. A., & Zia-ur-Rehman, M. (2021). A design of turnover intention antecedents and their relation on work design for firms. *Amazonia Investiga*, *10*(37), 24-33.

Rana, A. M., & Ahmed, A. M. (2022). A Propose Sustainable Mechanism for Academia and Industry Linkages: Perspective of Transfer of Innovation and Technology. *Journal of Positive School Psychology*, *6*(8), 10012-10026.

Zhang, Y., Rana, A. M., Bashir, H., Adeel, I., Khokhar, S., & Ding, J. (2023). Can university students' psychological resources stimulate the relationship between entrepreneurial optimism and green entrepreneurial intentions? Moderating role of sustainability orientation. *Sustainability*, *15*(8), 6467.

Khan, S., İftikhan, K., Farooq, S., & Mehmood, R. (2021). The impact of greenwash on consumer green purchase behavior: moderating role of green brand loyalty. *PJAEE*, *18*(10), 869-880.

Kayani, J. A., Faisal, F., Khan, S., & Anjum, T. (2023). Analysing Consumer's Intention to Buy Bottled Drinking Water in Pakistan Through Integrated Marketing Communication Framework. *Journal of Business and Management Research*, *2*(2), 881-902.

Khan, U. S. D. Z. U., & Khan, S. (2020). Impact of Employees' Behavior on Sales: A Case Study of L'oreal Pakistan. *Pakistan Social Sciences Review, 4(1),* 907-917.

Naseer, M., Khan, S., Khan, R., & Minhas, A. A. (2021). Employee Retention and Job Satisfaction in the Era of Transformative Marketing: An Investigation in Context of Pakistan. *International Journal of Management (IJM)*, *12*(2), 640-653.

Khan, S., & Haq, E. U. (2025). The Role of Pedagogical Strategies in Teaching Management Science to Hospitality Management Students. *Journal of Political Stability Archive*, *3*(1), 805-826.

Haq, E. U., & Khan, S. (2024). The Influence of Broken Homes on Students' Academic Performance in Schools. *Journal of Political Stability Archive*, *2*(4), 339-361.

Shah, S. M. A., Qamar, M. R., Ahmed, S., & Imran, M. (2025). Nepotism and Favoritism in HR Practices: Implications for Organizational Politics in Pakistan. *Journal of Management & Social Science*, *2*(1), 177-194.

Haq, A. U., Malik, S., Ullah, A., & Shah, S. M. A. (2024). Empowering Diversity: The Transformative Role of Inclusive Leadership in Modern Management. *Journal of Business and Management Research*, *3*(1), 876-891.

Noor, N., Khan, M. M., Irfan, M., & Shah, S. M. A. (2024). Diversity Management Practices and Inclusive Work Environment: A Study of Employees Working in Banking and IT Sectors. *International Journal of Social Science & Entrepreneurship*, *4*(2), 298-316.

Faisal, M., Qureshi, S. S., & Shah, S. M. A. (2025). HR's Role in Financing Green Supply Chain Transformations. *Bulletin of Management Review*, *2*(1), 271-303.

Janjua, Z. A., Shah, S. M. A., Khan, R., & Rashid, A. (2025). Ethical Leadership Strategies for Integrating AI Cloud Services in HRM. *Center for Management Science Research*, *3*(1), 274-292.

Janjua, Z. A., Qureshi, S. S., Shah, S. M. A., (2025). Human Resource Strategies for Improving Leadership Skills Among Hospitality *Graduates. Annual Methodological Archive Research Review,* 3(1), 13-29.

Shah, S. M. A., Raja, S. S., Shahzadi, S., & Naseer, S. (2024). Talent Management Strategies Effect The Approach Of Social Entrepreneurs And Organisational Effectiveness: A Case Study Of Pakistan. *Journal of Business and Management Research*, *3*(3), 58-84.

Naseer, H., Haq, A., & Farooq, M. (2018). Antecedent of employees career satisfaction, An empirical investigation of pharmaceutical sector of pakistan. *International Journal of Academic Research in Business and Social Sciences*, *8*(7), 281-99.

Muhammad, S., Anjum, T., & Fahad Khan Afridi, D. I. I. A. (2020). Impact of Transformational Leadership on Project Success Criteria: The Moderating Role of Work Engagement. *Palarch's Journal of Archaeology of Egypt/Egyptology*, *17*(6), 7460-7476.

Ali, W., Alasan, I. I., Khan, M. H., Ramayah, T., & Rahman, A. (2021). Strategy Is All About Deliberately Making Choices and Trade-Offs: Analogy Betweenfully-Fledged Islamic Banks and Conventional Banks with Islamic Windows. *Acad. Entrep. J*, *27*, 1-15.

Farooq, M., Ali, W., Younas, W., Khalil-ur-Rehman, F., & Qurashi, Q. A. (2019). The era of Transformative Marketing: Service Quality of Mobile App Based Taxi Services in Kuala Lumpur. *Proceedings on Engineering Sciences*, *1*(2), 49-58.

Ali, W., Ali, S., Khan, M. M., & Ghulam, W. A. (2020). Financial satisfaction of street vendors in Azad Kashmir: Moderating role of Customer relationship management. *Journal of Xi'an University of Architecture & Technology, 12(4), 5440-5461.*

Xu, Y. J., Bakar, S. M. B. S. A., & Ali, W. (2019). Role of public service motivation, organization values and reward expectation on performance of public sector employees in henan, China. *International Journal of Human Resource Studies*, *9*(4), 231-247.

Ali, W., Javaid, R., Tharwani, M. H. A., Ali, S., & Saher, S. (2020). An Empirical Investigation on the Loyalty of Islamic Banking Consumers.

Ahmad, K. U. R. (2018). Organizational Commitment and Ethical Conduct on Team Performance: Evidence from Pakistan. *International Journal of Academic Research in Business and Social Sciences*, *8*(7), 328-339.

Ali, N., Bilal, M., Qureshi, S. A., Toru, N., & Rana, A. M. (2020). Empirical Investigation of Privatization Process in Pakistan: Evidence from Statistical Experience. *Sarhad Journal of Management Sciences*, *6*(2), 385-402.

Ahmad, M. M., Qureshi, S. A., Bilal, M., & Rana, A. M. (2021). Dynamic Measuring the Impacts of Financial Fragility on the Performance of Non-Financial Firms Listed at the Pakistan Stock Exchange. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies*, *12*(1), 1-10.

Yazidi, R. A., & Rana, A. M. (2025). Impact of procurement management practices on the project performance: perspective of project management firms. *International Journal of Procurement Management*, *23*(3), 346-359.

Feng, Y., Rana, A. M., Bashir, H., Sarmad, M., Rasheed, A., & Ayub, A. (2023). What's love got to do with it? How does workplace romance provoke workplace ostracism and interpersonal conflict? *International Journal of Conflict Management*, *34*(4), 773-800.

Doan, Q. M., & Huynh, N. T. (2024). Assessing Green Port Performance by Multiple-Criteria Decision Analysis. *Grenze International Journal of Engineering & Technology (GIJET)*, *10,*22-38.

Huang, S. H., Hsu, W. K., Le, T. N. N., & Huynh, N. T. (2025). The selection model of international air express for high-tech manufacturers in airfreight of sample products: the fuzzy best-worst method. *Asia Pacific Journal of Marketing and Logistics, 14(2)*, 43-55.

Hsu, W. K. K., Huang, S. H. S., Le, T. N. N., & Huynh, N. T. (2024). The hazard analysis of passenger-cargo ferries: a revised risk matrix model based on fuzzy best–worst method. *Environmental Science and Pollution Research*, 1-15.

Thu, L. N. N., Van Hoang, L., Doan, Q. M., & Huynh, N. T. (2024). The performance model of logistic distribution centers: Quality function deployment based on the Best-Worst Method. *PloS one*, *19*(10), e0305202.
Hsu, W. K., Huang, S. H., Le, T. N. N., Huynh, N. T., & Wang, D. J. (2025). Assessing container terminals' efficiency from the sustainable development perspective: The BWM-GRA-SBM model. *Transport Policy*, *162*, 443-455.
Huang, S. H., Chen, J. W., Nguyen, H. T., & Hsu, W. K. (2025). An assessment of service quality for cold-chain logistics in air freight: A Perception-Expectation gap model based on fuzzy Best-Worst Method. *International Journal of Refrigeration*, *170*, 164-171.
Hsu, W. K., Huang, S. H. S., Le, T. N. N., & Huynh, N. T. (2024). Evaluating Vietnam's container terminal efficiency considering carbon neutrality. *Utilities Policy*, *90*, 101809.
Hsu, W. K. K., Huynh, N. T., Le Quoc, T., & Yu, H. L. (2024). An assessment model of eco-efficiency for container terminals within a port. *Economics of Transportation*, *39*, 100359.
Nguyen, T. Q., Huynh, N. T., & Hsu, W. K. K. (2021). Estimate the impact of payments for environmental services on local livelihoods and environment: an application of propensity scores. *Sage Open*, *11*(3), 21582440211040774.
Hsu, W. K., & Huynh, N. T. (2023). An evaluation of productive efficiency for container terminals affiliated to a single organisation. *Journal of Transport Economics and Policy (JTEP)*, *57*(1), 59-76.
Hsu, W. K. K., Huang, S. H. S., Huynh, N. T., & Huang, K. H. (2024). An evaluation model of sustainable efficiency for container terminals. *Sustainable Development*, *32*(1), 1170-1187.
Hsu, W. K., Wei, Y. C., Lee, C. H., Hoang, L. V., & Huynh, N. T. (2023, March). A risk assessment model of work safety in container dry ports. In *Proceedings of the Institution of Civil Engineers-Maritime Engineering* (Vol. 176, No. 4, pp. 193-205). Emerald Publishing Limited.
Hsu, W. K. K., Tai, H. H., Tan Huynh, N., & Chen, J. W. C. (2022). Assessing the investment environment in container terminals: A knowledge gap model. *Proceedings of the Institution of Mechanical Engineers, Part M: Journal of Engineering for the Maritime Environment*, *236*(3), 585-599.
Hsu, W. K., & Huynh, N. T. (2023). Container terminals' efficiency with the unexpected output: a revised SBM approach. *Environmental Science and Pollution Research*, *30*(13), 37845-37858.
K Hsu, W. K., S Huang, S. H., & Tan Huynh, N. (2021). An evaluation model for foreign direct investment performance of free trade port zones. *Promet-Traffic&Transportation*, *33*(6), 859-870.
Hsu, W. K. K., Huang, S. H. S., & Huynh, N. T. (2023). An assessment of operating efficiency for container terminals in a port–An empirical study in Kaohsiung Port using Data Envelopment Analysis. *Research in Transportation Business & Management*, *46*, 100823.
Nguyen, T. Q., Ngo, L. T. T., Huynh, N. T., Quoc, T. L., & Hoang, L. V. (2022). Assessing port service quality: An application of the extension fuzzy AHP and importance-performance analysis. *PloS one*, *17*(2), e0264590.
Masih, S., Punchanathan, U. E., Naqshbandi, M. M., & Ahmed, F. (2025). How inclusive leadership drives change-oriented extra-role behaviors via leader-member exchange and trust in leadership. *Global Knowledge, Memory and Communication, 4*(4), 177-192.

.

Masih, S., Saher, S., & Raju, V. (2021). Consequences of self-defeating humor on employee commitment via emotional dissonance. *International Journal of Business and Administrative Studies*, *7*(4), 77-92.

Masih, S. H. A. H. B. A. Z. (2022). The Effect of Humor in Leadership on the Change-Oriented Organizational Citizenship Behavior in Telecom Sector of Pakistan: A Moderated Mediation Model of Power Distance Orientation and Leader-Member Exchange. *Limkokwing University of Creative Technology 4*(2), 35-48.

Masih, S., Punchanathan, U. E., & Osigwe, L. K. (2024). Influence of Green Transformational Leadership on Environmental Citizenship Behaviors via Green HRM Practices. Application of Resource-Based View Theory in the Tourism Industry of Pakistan. *International Journal of Business and Economic Affairs*, *9*(3), 1-15.

Masih, S., Raju, V., & Saher, S. (2022). Integrated approach of self-focused humor styles at workplace: The role of trust in leader. *Journal of Positive School Psychology*, *6*(2), 55-68.

Masih, S., Raju, V., Ali, W., & Saher, S. (2021). Integration of Leader's Other-Focused Humor Styles: Cultivation of Subordinates' Extra-Role Behavior. *Review of International Geographical Education Online*, *11*(11), 23-39.

Saher, S., Masih, S., & Raju, V. (2021). Impact of despotism on well-being through perceived stress and moderating role of emotional intelligence: A testing of social exchange theory. *Journal of Administrative and Business Studies*, *7*(1), 01-11.

Hewawitharana, A., Saher, S., Daniel, K., Masih, S., & Daniel, I. (2020). Influence of despotic leadership on personnel lives via emotional exhaustion and moderating role of perceived supervisory support. A testing of COR model. *Global J. Environ. Sci*, *2*(1), 56-69.

Masih, S., Daniel, K., Daniel, I., Saher, S., & Hewawitharana, A. (2020). Affiliative and self-enhancing humor in leadership and their relationship to employee well-being and creativity via LMX. *Global Journal of Emerging Sciences*, *2*(1), 35-55.

Mankash, M. A., Dahri, K. H., & Naveed, M. (2024). English Language Anxiety Among Pakistani University Students: Causes and Coping Strategies. *Policy Journal of Social Science Review*, *2*(4), 941-960.

Ahmed, M. R., Mushtaq, N., & Dahri, K. H. (2023). The Effect of Learning Vocabulary Through Games for Undergraduate and ESL Learners. *International Research Journal of Management and Social Sciences*, *4*(3), 319-331.

Hussain, K., Muhiuddin, G., & Oad, L. (2021). The influence of parental relationship on students' educational attainment at secondary level in Karachi, Pakistan. *Multicultural Education*, *7*(11), 415-423.

Oad, L., Shah, R., Sewani, R., Ahmad, N., Akhtar, N., & Imran, M. (2024). Empowerment of Artificial Intelligence in Learning Optimisation Student Perceptions in Karachi, Pakistan. *International Journal of Educational Sciences*, *47*(2), 34-44.

Hussain, A., Jat, Z. G., Hassan, M., Hafeez, A., Iqbal, S., & Imran, M. (2022). Curriculum Reforms in School Education Sector in Sindh; What Has Changed? *Journal of Positive School Psychology, 6(9),* 2675-2687.

Hafeez, A., Iqbal, S., & Imran, M. (2021). Impact of Devolution of Power on School Education Performance in Sindh after 18th Constitutional Amendment; *Journal of Development and Social Sciences, 2*(IV), 273-285. http://doi.org/10.47205/jdss.2021(2-IV)24

Imran, M., Kazmi, H. H., Rauf, M. B., Hafeez, A., Iqbal, S., & Solangi, S. U. R. (2022). Internationalization Education Leadership of Public Universities of Karachi. *Journal of Positive School Psychology,* 6(11), 1175-1188.

Ahmed, S., Ahmed, S., & Buriro, A. (2023). Strategies and Best Practices for Managing Cost Overruns in the Construction Industry of Pakistan. *Propel Journal of Academic Research, 3(1),* 28-55.

Khan, R., Hussain, A., & Ahmad, S. (2023). Revolutionizing Human Resource Management: The Transformative Impact of Artificial Intelligence (AI) Applications. International Journal of Social Science & Entrepreneurship, 3(4), 306-326.

Alam, R. K. (2025, February 7). Translating policies into climate resilience. *DAWN*. Dawn