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Barriers to Climate Finance in Developing Countries: A Theory of Constraints Analysis from Pakistan

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Abstract
Climate finance is a fundamental mechanism for enabling emerging economies to mitigate and adapt to minimize the impact of climate change. Despite Pakistan's negligible contribution to global greenhouse gas emissions, it is still on the top list of highly climate-vulnerable nations, facing escalating environmental, social, and economic risks. This study investigates the specific barriers hindering the resource allocation and efficient utilization of climate finance in Pakistan. Guided by the Theory of Constraints and adopting a qualitative case study design, the research incorporates semi-structured interviews, participant observation, and document review with key stakeholders, including policymakers, financial institutions, NGOs, and community representatives. Data were thematically analyzed using MAXQDA software. Eight key barriers emerged: (1) lack of awareness on climate change, (2) lack of technical expertise and institutional capacity, (3) institutional inefficiencies and procedural delays, (4) lack of resources and inadequate stakeholder collaboration, (5) lack of national monitoring and evaluation framework, (6) lack of financial incentives for green practices, (7) government disincentives, and (8) bureaucratic barriers. These constraints are interlinked, reinforcing inefficiencies in accessing and deploying domestic and international climate finance. The study contributes to the knowledge resources by offering context-specific insights into climate finance barriers in Pakistan and proposes targeted policy reforms to enhance institutional capacity, foster multi-level coordination, incentivize green practices, and streamline procedures for timely fund

mobilization. Findings have broader implications for other developing countries facing similar socio-political and institutional constraints in climate finance governance.

Keywords: Climate finance, Theory of Constraints, Pakistan, barriers, climate change adaptation, policy reform

Introduction

The expanding effects of climate change have emerged as one of the most important concerns of the twenty-first century, endangering ecological stability, economic resilience, and human well-being globally. These dangers become worse in developing countries due to a lack of adaptive capacity, institutional fragility, and inadequate resources. Pakistan demonstrates this paradox: although contributing little to global greenhouse gas emissions, it constantly ranks as the most climate-vulnerable country (Asian Development Bank, 2021). Rising temperatures, irregular precipitation, recurring floods, glacial melt, and extreme weather events have hampered livelihoods, aggravated poverty, and jeopardized food, water, and energy security (Feulner, 2017).

Mobilizing climate finance is critical to mitigating these risks. Climate financing, as defined by the UNFCC (2020), is the generation of funding from public, private, and other available sources to support mitigation and adaptation initiatives. It includes grants, concessional loans, bonds, carbon markets, and novel Islamic finance instruments. However, despite international pledges under the Paris Agreement and domestic policy initiatives, Pakistan confronts institutional barriers to accessing and successfully utilizing such funding. These obstacles not only limit the scope of climate action but also jeopardize and undermine the achievement of the Sustainable Development Goals (SDGs) and long-term climate resilience.

The existing literature on climate finance has primarily focused on barriers in prosperous or emission-intensive countries, with little consideration paid to politically fragile, resource-constrained economies such as Pakistan (Kouwenberg & Zheng, 2023). Pakistan's current socio-political landscape is creating significant hurdles in managing climate finance activities. According to (Creswell, 2007), in qualitative research, a knowledge gap refers to areas of opportunity, and new inquiries emerge due to a deficiency or lack of existing research. In research identifying a new knowledge gap includes exploring different areas that have not been explored previously or have unreliable findings that create area for further study. However, Pakistan's unique political and socioeconomic context presents specific challenges that have not been fully explored or studied specifically related to climate finance. This gap in the literature review shows that an in-depth and comprehensive study is required to highlight barriers to climate finance in Pakistan tailored to its distinctive conditions.

This paper addresses the research gap by exploring Pakistan's institutional, socio-political, procedural, and technological barriers hindering climate change adaptation and mitigation through climate finance. The study uses the Theory of Constraint as a guiding framework for the

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identification of constraints that limits a specific initiative or phenomenon’s performance. Goldratt developed this theory in the 1970s to assess and improve the limitations and strategies for solutions. The Theory of Constraint is a multi-faceted scheme approach that is developed and designed to assist organizations and people to evaluate their constraints and barriers, develop solutions, and implement those solutions effectively and efficiently according to the theory's five main steps model (Mabin, 1999).

Furthermore, the study adopted a qualitative case study method by using social constructivism as a research paradigm for conducting in-depth analysis of the stakeholders’ opinion of the climate finance from government officials to community actors and change agents. According to Ullah (2014), in social constructivism, the researcher and the participants co-create the knowledge relevant to the phenomena by interpreting the words their meanings, and observations. This approach normally adopts qualitative data collection techniques including interviews, observations focus group discussions, and documents. The findings of the study highlighted eight interconnected barriers that are limiting Pakistan’s ability to mobilize the climate finance effectively and efficiently. Besides finding the barriers, this study also makes policy recommendations for making reforms in strengthening the governance framework, increasing collaborations and technical competence, and making reforms at different levels.

Literature Review

Climate finance has gained significant attraction after the Paris Agreement in December 2025, which aims to control the global temperature rise to below 2°C above pre-industrial levels. This phenomenon focuses on the funding of public and private investments for mitigation and adaptation of climate change along with exploring investors’ awareness and attitudes towards climate risks, its impacts on investment decisions, and financial modelling and methods of pricing and hedging climate risks in financial markets.

According to the UNFCC (2020), climate finance refers to financing generated from public, private, and other relevant sources for climate change mitigation and adaptation strategies and actions to be completed. It mainly aims to lessen carbon emissions and vulnerabilities and improve and strengthen the ecological and human resilience against the prevailing climate challenges. Höhne et al., (2012) divided climate finance into mitigation and adaptation finance. Mitigation finance discusses the funds invested to control and lessen carbon emissions. In contrast, adaptive finance discusses the funds invested to raise the adaptive capacity of human and ecological systems against climate change. In a broader context of finance, climate finance differs from traditional finance as it focuses on return on profit and contributes to environmental protection and social benefits. These climate financing tools include grants, charity funds, bonds, sukuk, carbon trading and carbon taxes, and international loans designed specifically for environmental protection activities. However, underdeveloped countries face many barriers and issues while accessing the available climate finance to study the climate financing barriers that are hindering climate financing in Pakistan.

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To get a clear idea of the available climate financing literature in Pakistan, the contextual literature review method is adopted for studying the available literature. In the contextual literature review, the researcher mainly focuses on challenges and barriers within a broader context of socio-political, economic, and environmental conditions. This type of literature review is good for complex phenomena to allow for situational analysis of how external factors can hinder the climate finance process and become barriers (Djamba & Neuman, 2021). Kouwenberg & Zheng (2023) stated that climate finance studies are important for two reasons: firstly, mitigating climate change to decrease and limit global warming through substantial investments in renewable energy, adaptation of new technologies, and initiatives that aim to reduce the energy intensity of countries and economies. For instance Boehm et al., (2021) estimated that the climate flows need to reach USD 5 trillion by 2030 to achieve the ambitious target of limiting global warming to 1.5°C. Adding to it, climate change adaptation will also require extensive financial support, especially in developing countries due to their vulnerability to climate change caused by rising temperatures and sea levels. UNEP (2022) estimated that the adaptation initiative will cost vulnerable countries from USD 140 to 300 billion annually by 2023. Historically, mitigation finance has received the majority of these flows, with a focus on renewable energy deployment, industrial decarbonization, energy efficiency, and sustainable transportation (Hagemann et al., 2023). Adaptation financing, which supports measures such as climate-resilient agriculture, flood barriers, and early warning systems, is relatively underfunded, accounting for only 7-10% of global climate finance despite its crucial role in decreasing vulnerability (UNEP, 2022). The disparity between mitigation and adaptation reflects both structural and market biases: mitigation projects frequently produce measurable carbon reductions that appeal to investors, whereas adaptation benefits are more diffuse, context-dependent, and difficult to quantify (Landauer et al., 2015).

Access to climate finance is limited in developing countries by a series of recurring issues that cross national borders. Many governments lack the governance frameworks, technical competence, and inter-agency coordination processes required to successfully plan, secure, and administer climate money (Timilsina, 2021). The lack of reliable and disaggregated climate data hinders evidence-based decision-making and the development of bankable project proposals (Tall, Arame; Lynagh, Sarah Bashford; Blanco Vecchi, n.d.). Another key hindrance is procedural hurdles, as international climate funds frequently need substantial documentation, rigorous fiduciary rules, and lengthy approval processes, all of which cause high transactional costs, particularly for smaller-scale participants. Weak enabling environments and policy uncertainty limit business sector participation, while political instability, corruption risks, and competing development agendas draw focus away from climate goals (Kouwenberg & Zheng, 2023).

South Asian countries are particularly vulnerable to global issues due to their large population densities, reliance on climate-sensitive sectors such as agriculture, and persistent poverty. Pakistan is the most affected by the risk associated with climate change with an increase in its

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vulnerability despite its negligible contribution in the global warming. The reason behind the potential impact of climate change on South Asian countries is its vast population, dependency on agriculture-based economies, and poverty which causes serious risks to the social, economic, and ecological systems (Ali & Erenstein, 2017).

This risk exposure ranking is driven by the nation's exposure to natural calamities and the risk of internal conflict. In managing climate change, the financial capacity of a country is essential in guaranteeing timely policy development and implementation. However, many barriers can be recognized that halt overall climate action investments causing many inefficiencies during the process (UNFCC), 2020). Additionally, unavailability of financial support may confine the human and operational capability needed and required for efficient policy development and implementation leading to several barriers as currently, the country is distressed by many financial limitations in climate action implementation.

Bangladesh and Sri Lanka, for example, have developed national climate finance policies to integrate domestic and international resources, but they still have donor coordination challenges, restricted project pipelines, and weak monitoring and evaluation systems (UNESCAP, 2017). The establishment of the Climate Change Trust Fund in Bangladesh has given the country a domestic source of funding for adaptation; however, its sustainability is limited by irregular replenishment and little involvement from the private sector (Barua & Hossain, 2019). The severe risks the nation faces are demonstrated by the devastating floods of 2022, which caused an estimated USD 30 billion in damages and the displacement of 33 million people (Government of Pakistan, 2022). While policy frameworks such as the National Climate Change Policy (2014) and its Implementation Framework (2014-2030) exist, several studies show that efficient mobilization and deployment of climate financing remain a challenge. Public and political understanding of climate change remains low, with some stakeholders viewing it as a foreign-driven agenda unrelated to current development concerns. The lack of specific fiscal incentives, such as tax credits for renewable energy or subsidies for sustainable practices, deters private investment in low-carbon technology (UNEP, 2022). Procedural bureaucracy, such as the need for several no-objection certificates and inter-ministerial clearances, slows down fund access and project implementation.

Despite a substantial global literature on climate finance barriers, the majority of existing research focuses on developed countries or large emerging economies, providing limited insight into politically fragile, resource-constrained contexts where institutional weaknesses and sociopolitical complexities have a significant impact on financing flows. Within Pakistan, research attention has tended to focus on general climate policy or adaptation methods, rather than carefully mapping the specific, context-dependent barriers to climate financing or rooting the analysis in the viewpoints of important stakeholders. The potential of Islamic finance to supplement traditional climate funding has gotten even less empirical investigation, with current talks remaining primarily theoretical and detached from operational reality. This study fills these gaps by using the Theory of Constraints to identify and analyze the most relevant barriers that

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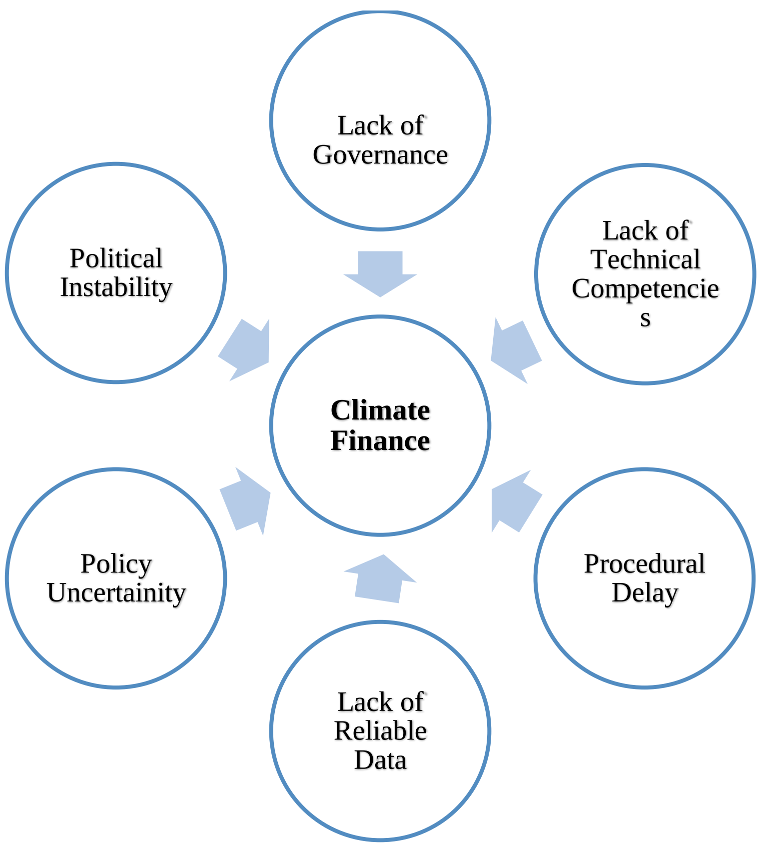
are hindering climate finance in Pakistan through the adopting different research techniques in processing the expert opinions of the stakeholders of climate finance.

Theoretical Framework

The theoretical framework serves as the foundation for theory in qualitative research studies, including a narrative explanation of how researchers utilize theory to explore and investigate the research problem. Additionally, the theoretical framework provides a structure to the research process, based on existing literature to understand theories, concepts, and ideas, thus establishing a basis for achieving research objectives (Green, 2014). It is also a map that guides the researcher by adopting the relevant theory to accomplish the research objectives and purpose of the study. This paper adopted Theory of Constraint as the theoretical lens for the identification of constraints that limit a specific initiative or phenomenon's performance.



Methodology

The study adopted a qualitative research approach for analyzing the multi-faceted and context-specific barriers of climate finance. Due to the exploratory nature of the study and the necessity

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to capture the complex and expert opinions of stakeholders directly involved in climate finance activities, a qualitative technique was considered most appropriate ((Hammarberg et al., 2016).
The study uses a single-case study approach that focuses on Pakistan's climate finance landscape. The case study approach is very helpful for exploring a current phenomenon in real-world contexts, especially when the boundaries between the phenomenon and context are uncertain (Creswell, 2009). Pakistan was chosen specifically because of its significant climatic vulnerability, fiscal restrictions, and underexplored institutional dynamics in the climate finance arena. The case selection in this study is based on purposive sampling and the data were gathered using semi-structured interviews, participant observation, and document examination. The data were gathered using semi-structured interviews, participant observation, and document examination. Semi-structured interviews were chosen for their adaptability, allowing the researcher to examine preset themes while responding to the conversational flow and developing issues expressed by participants (Alshenqeeti, 2014). Experts included federal and provincial politicians, financial institution representatives, and officials from non-governmental and community-based organizations, academics, and foreign agency experts working on climate finance in Pakistan.
Thematic data analysis was carried out using MAXQDA software. The analysis process involves systematically organizing, interpreting, and reporting the data collected from the interviews and participants' observations. The main purpose is to highlight the barriers related to climate finance in Pakistan in line with the research objectives. According to Yin, (2023), thematic analysis is the most frequently used technique in qualitative research. It involves identifying patterns and themes, analyzing the frequency of word repetition, and examining key concepts linked to a specific phenomenon. The data process typically involves coding data through the software to make sense of the data (Wong, 2008).This analysis method facilitates identifying the patterns and themes collected in the dataset for a more in-depth understanding of climate finance barriers (Naeem et al., 2023). This method is widely used in qualitative research due to its flexibility and systematic approach to analyzing the data beyond the basic responses; rather, it is used to investigate more complex barriers. It is also used to develop a conceptual model for research findings following a series of steps including coding, theming, keywords, quotations, and interpretations.
According to Flick (2022), both thematic and discourse analysis use the same principles in data analysis, including coding, theme identification, refining, and reporting. According to Marjaei et al., (2019), thematic analysis is the widely used qualitative method for identifying new themes within the data through the latest data analysis software like MAXQDA. This software is designed and developed for qualitative and mixed-method data analysis. It is used for managing and categorizing the data, coding, retrieving, analyzing, and transcribing the data.

As stated by Skinner et al., (2020), qualitative research is criticized for its quality assessment, as it is normally too specific regarding particular social phenomena and lacks credibility in the case of a more generalized context. This study adopted validity and reliability

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techniques to ensure the research finding's consistency with the reality and basic criterion for evaluating the degree of consistency in the research. This study also adopted ethical concerns; as stated by Orb et al., (2001), ethical considerations are the essential ingredients for ensuring the integrity and credibility of the research inquiry. Based on the embedded relationship between the researcher and participants in a qualitative study, the researcher mainly focuses on collecting human experiences, interactions, and their natural environments for a more in-depth and informed decision.

Findings and Discussion

This study highlighted eight interconnected barriers that are hindering the climate finance mobilization and management in Pakistan. Each barrier strengthens the others and causes a self-sustaining cycle of inefficiency. Using the Theory of Constraints framework helped to identify the barriers that have the largest systemic influence, while thematic analysis showed how they manifest in practice.

One of the most dominant restrictions is the general lack of information and often negative opinion of climate change, which affects certain policy actors as well. Several experts underlined that climate change is usually viewed as a foreign agenda or a secondary concern in the face of serious socio-economic demands. This perception gap is not limited to rural communities but also extends to portions of the business world, where environmental concerns are perceived as costs rather than investments. Such attitudes further weaken the demand for climate-resilient policies, limit political incentives for reform, and, ultimately, undermine the argument for local and international climate financing. Similar findings have been reported in other emerging countries where climate action struggles to gain traction in the absence of a strong domestic constituency (Amundsen et al., 2021). This limitation is critical under Theory of Constraints because efforts to remedy downstream technical or procedural issues may face persistent resistance if awareness is not raised. Closely related to this is a lack of technical expertise and institutional capacity to design, sell, and implement climate finance projects. Participants frequently stated that Pakistan lacked the necessary specialists to meet the demanding requirements of international climate funds such as the Green Climate Fund. This talent gap impedes both the drafting of competitive proposals and the effective execution of projects after funding is secured. According to the global literature, such capacity gaps are a key bottleneck in low- and middle-income countries, where technical talent is frequently concentrated in a limited number of persons or organizations (Barnard et al., 2014). In Pakistan, this restriction is exacerbated by a lack of persistent investment in capacity development and a high turnover rate of trained individuals, resulting in an ongoing cycle of institutional memory loss.

Another significant impediment that emerged is that institutional inefficiencies and procedural delays also create a hurdle in the successful implementation of climate finance initiatives in Pakistan. As per the experts, procedural delays are the main obstacles in climate finance implementation, as they slow down the processes of timely imitation and completion. These inefficiencies are very harmful and resulting loss of funding opportunities and donor confidence. As per the Theory of Constraints, such inefficiencies are high-leverage limitations and their solutions will also eliminate the bottlenecks from the climate finance processes.

These issues get worsened with the passing time by lack of resources and inadequate stakeholder collaboration. Experts stressed the lack of communication among the federal and provincial ministries and climate change actors, which created hurdles in replication of activities and resources overspending, and donor mistrust. The lack of integrated planning processes hinders the resource pooling and its effective and efficient use.

Experts also highlighted that climate-related projects are frequently designed in closed-door rooms by neglecting larger development objectives of their sustainability. This lack of a strong and solid national monitoring and evaluation framework impedes the ability of productivity and progress assessment mechanisms. These inefficiencies not only negatively affected the running investments but also undermined the country's credibility and increased the donor mistrust. Furthermore, the implementation and development of extensive policies and plans for climate change consideration are progressively surfacing today across countries, public and private, and government levels (Lesnikowski et al., 2021).

One of the experts mentioned that those businesses that are working to adopt environmentally friendly practices needs to be incentivized by the governments to cover the associated costs with avoiding environmentally harmful activities. Those businesses that are avoiding climate-destructive activities in their manufacturing processes should get compensation through tax reduction.

The experts highlighted the government's role in hindering the utilization of climate finance. Despite Pakistan's abundant natural resources, the country is lagging in utilizing green energy due to the government's inability and prioritization for climate finance. The government is failing in not only receiving green initiatives but also discouraging the businesses by imposing high taxes and neglecting their contribution in adopting green practices.

Finally, bureaucratic barriers continue to impede access to and use of climate funds. Participants noted the time-consuming processes of acquiring various no-objection certificates, securing inter-ministerial clearances, and adhering to multiple regulatory requirements. These administrative requirements not only slow down project commencement, but they also raise transaction expenses, rendering smaller-scale initiatives financially unsustainable. In the Theory of Constraints framework, bureaucratic barriers serve as direct limitations on throughput; reducing them could result in immediate efficiency advantages.

The interconnection of these eight barriers means that progress in one area is likely to be hampered if others are not addressed. A more integrated approach and continuation of policies is the ultimate solution for the climate finance activities success. Failure of one activity can negatively affect the success of another activity. Raising public awareness regarding climate finance without providing substantial financial incentives may not provide the required result in long-term behavioral change. The Theory of Constraint approach emphasizes the need to identify

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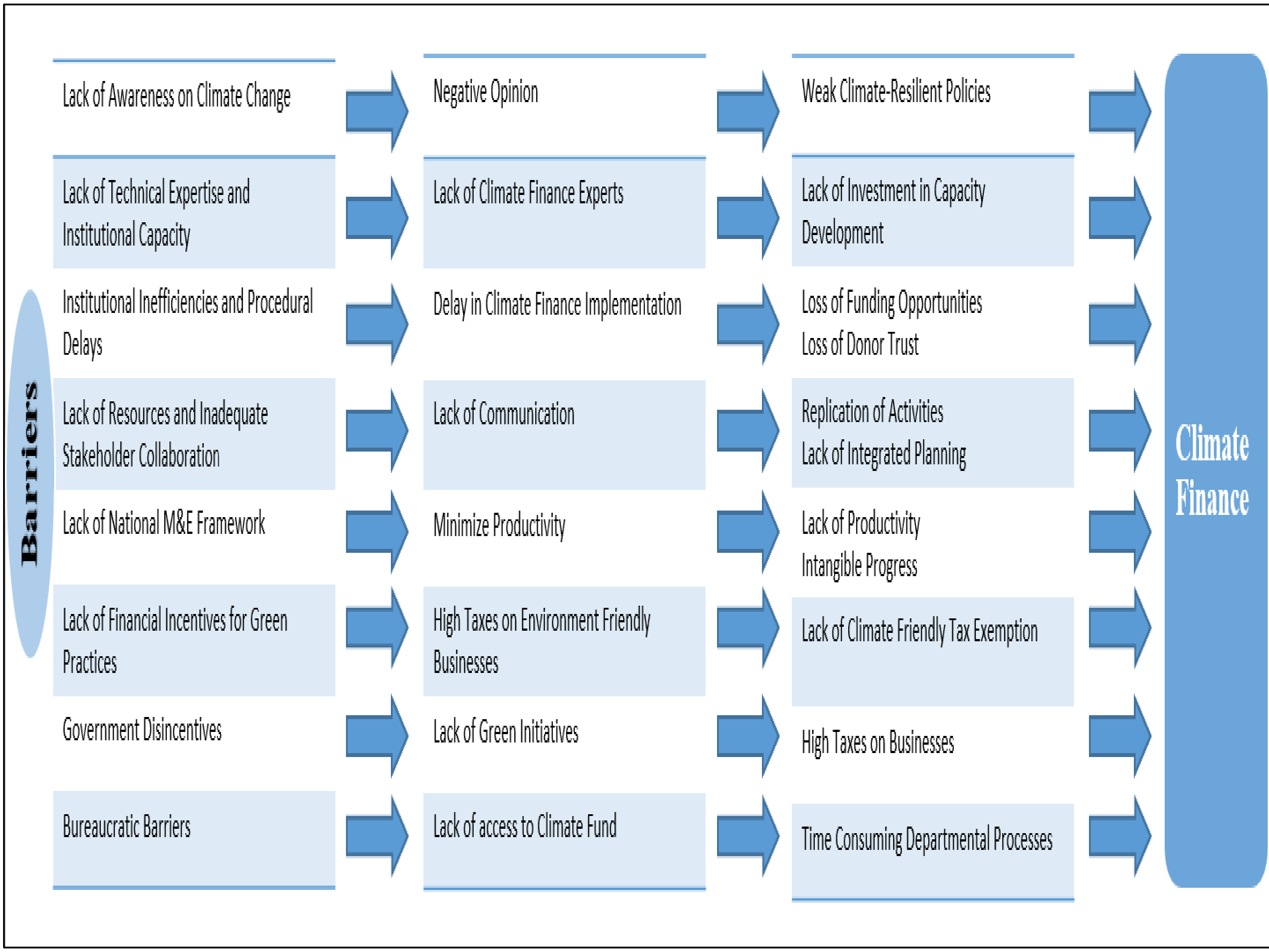
and prioritize the restriction that most limits the system's performance at any given time and then focus reform efforts on that bottleneck before moving on to the next one. In Pakistan, institutional inefficiency, insufficient capacity, and poor strategic planning emerge as the primary constraints, along with other issues supporting them.

Revised Theoretical Framework



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Conclusion and Policy Recommendations

The study's results highlighted the reality that Pakistan's difficulty in mobilizing and using climate finance effectively and efficiently is rooted in a complex matrix of institutional, socio-political, technological, and procedural restrictions. Applying the Theory of Constraints provided a structured method of identifying the barriers that have the greatest systemic impact, revealing that limited institutional efficiency, insufficient technical capacity, and a lack of coherence in long-term planning are the core constraints around which other challenges revolve. These concerns are linked with poor institutional coordination causes procedural delays, insufficient technical capability restricts the quality of proposals, and short-term planning weakens donor confidence and limits the potential impact of financial flows. They form a feedback loop that prevents climate funding from achieving the scale, speed, and effectiveness required to address Pakistan's growing climate vulnerability. Breaking this pattern will necessitate a deliberate and sequential reform effort that prioritizes the most pressing restrictions while creating momentum for greater system-wide improvements. The research identifies numerous priority areas for action. Raising public and political awareness of climate change and repositioning it as a national development and security necessity rather than a peripheral or externally imposed goal is a critical first step. Without such awareness, political incentives for transformation would be weak, and societal demand for climate-responsive investment will be low.

In parallel, ongoing investment in technical and institutional capability is required. This includes not just training a broader pool of professionals who can navigate international climate finance processes, but also maintaining them within critical institutions to prevent institutional memory loss. Establishing dedicated climate finance departments at the federal and provincial levels, staffed by experts in project design, financial modelling, and monitoring and evaluation, might help Pakistan compete for and manage funding more successfully.

Institutional and procedural reforms must also address the fragmentation of responsibilities across levels of government and streamline the regulatory environment. Clear job delineation, quick approval processes, and digitalized application and reporting systems have the potential to cut delays and transaction costs, allowing both public and private players better access to money. Aligning national and provincial planning cycles with climate targets will help to guarantee that climate finance is included in overall development initiatives rather than viewed as an afterthought. From a financial policy standpoint, implementing targeted incentives for green investment is crucial.

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