

**FROM VULNERABILITY TO RESILIENCE: INGOS AND
CLIMATE ADAPTATION STRATEGIES IN PAKISTAN**

Rooh ul Amin*

PhD Scholar IR, Department of Political Science and International Relations, Qurtuba
University of Science and Information Technology Peshawar
Email: Roohulamin98@gmail.com

Dr Aziz Ur Rahman

Associate Professor (HoD) International Relations, Political Science
Email: aziz@qurtuba.edu.pk

Bibi Neelam

MS Human Resource Management National University of Modern Languages
Peshawar Campus
Email: ck34305@gmail.com

Abstract

Climate change poses one of the most pressing threats to Pakistan, jeopardizing water, food, and energy security while exposing communities to floods, droughts, and extreme weather. The national initiatives, like the National Climate Change Policy (NCCP) of 2012 and the implementation framework of 2014, are the result of the rising climate variability in the country since the 1990s. Regardless of these achievements, Pakistan still has difficulties with enforcement, institutional capacity, and knowledge integration between the researchers and policymakers. This research paper explores the extent to which international non-governmental organizations (INGOs) contribute to enhancing the resilience framework in Pakistan and focusing on three aspects of disaster reduction risk, policy advocacy, and community-level adaptation. The analysis will be conducted through panel econometric and complementary qualitative review and it will look at the interaction between financial innovation, external capital flows and adaptation governance. It has been shown that, together with local NGOs, INGOs have played a key role in creating community preparedness, assisting provincial governments, and sealing resource gaps. However, findings also reveal limitations including lack of ownership at the local level, weak institutional enforcement, and fragmented coordination across governance tiers. Importantly, the evidence highlights that community resilience improves where INGOs actively integrate local participation, technology transfer, and awareness-building into adaptation strategies. This study concludes that Pakistan's resilience framework requires stronger institutional mechanisms, enhanced collaboration with INGOs, and systematic investment in research and public awareness. Strengthening these dimensions will not only reinforce

disaster risk reduction but also advance long-term adaptation pathways toward sustainable climate governance.

Keywords: Climate Change Adaptation, International NGOs (INGOs), Community Resilience, Disaster Risk Reduction, Panel cointegration, VECM: DOLS, Pakistan

Introduction

Climate change has turned into one of the most acute global challenges of the twenty-first century affecting the ecosystem and human security, socioeconomic development at both a global and regional level. The physical impact of this crisis is the increase in world temperature, the changing patterns of precipitation and the increase in the number of extreme weather events (floods, droughts and heatwaves). Developing countries are particularly hard hit as they lack well established institutional structures and financial resources to mitigate and adapt to the changes in the environment (Raihan, 2023; Zeeshan, Han, Rehman, Ullah, & Afridi, 2021). The non-environmental dimension of climate change, that it is a multi-dimensional process that influences governance, the health of the people, the relationship between genders, and economic stability, is not a new finding among scholars. Resilience and adaptation are the concepts that have come out in this international framework as vital concepts in the climate research (Leal-Arcas, Almaniya, Alawdah, Alshehri, & Al-Ruwayshid, 2025). The study defines resilience as the capacity of the system and community to absorb shocks, recover, and adapt compared to adaptation which is concerned with the conscious changes made in the societies in response to the actual or perceived climatic stimuli. Such conceptual frameworks provide some degree of conceptual framework where the coping mechanisms of local communities (especially those of the vulnerable countries) with the threat of climate change can be examined.

To Global to Regional Focus

South Asia is known to be one of the most climate-prone regions in the world, where there has been the combination of hazards such as melting glaciers, monsoon variability, cyclones, and rising sea levels. Countries such as Bangladesh, India, Nepal and Pakistan rank continuously on the Global Climate Risk Index at the highest 7 as they are more exposed and vulnerable (Shafiq et al., 2025). A large population of people lives in the area and relies heavily on agriculture and natural resources, which further increases the risks posed by climate variability. Besides, the situation is worsened by socioeconomic inequalities, poor infrastructure and little preparedness to disasters, which complicates but makes adaptation urgent. Researchers claim that the concept of climate resilience in South Asia cannot be explained in the context of the state-driven efforts, but has to consider influence of transnational organizations, international financing channels and the local based adaptation strategies. In this regional context, Pakistan can be singled out as an especially critical case because of its geographical and socioeconomic vulnerabilities such as its dependence on the Indus river system, on climate-dependent sectors, and weak governance systems (Ahmad et al., 2023).

Pakistan-specific Context

Over the last 20 years, Pakistan was among the top ten most impacted countries due to climate change. Climate hazards in the country have a very broad range of effects, including disastrous floods like those in 2010 and 2022, years of prolonged dry periods in arid areas, glacial lake burst floods in the north, and city heat waves in large urban areas (Ali & Parvin, 2025). These have led to extreme losses in human and economic, and infrastructural aspects, reversing the gains of development and throwing the vulnerable groups into the trap of poverty. The climate susceptibility of Pakistan has also been worsened by the governance issues, low adaptive capacities, and inadequate integration of national policies and local demands. The government has formulated strategic frameworks including National Climate Change Policy (NCCP) and provincial adaptation plans but their advantages are limited due to the limited resources and poor implementation mechanisms (Masud & Khan, 2024; Zeeshan, Han, Rehman, Ullah, & Mubashir, 2022). The studies intersect through governance and resilience: effective political stability and resource management reduce vulnerability, while INGOs strengthen adaptive capacity, jointly fostering sustainable economic growth and climate resilience in Pakistan (Zeeshan, Rehman, Ullah, Hussain, & Afridi, 2022). The role of the international non-governmental organizations (INGOs) has become crucial in such a delicate environment. INGOs are supplementary to the activities of the state since they offer technical knowledge and capacity, financial support, and grassroots actions that can help in dealing with the short-term climatic hazards and at the same time increase long-term adaptive ability in the community in question (Delina, Shi, Gaviola, & Cagoco-Guam, 2025).

Theoretical Background: Resilience and Adaptation

The resilience and adaptation of the study of climate change has greatly relied on the social-ecological systems, vulnerability analysis, and adaptive governance theories. The resilience theory points out that the communities facing climate risks need flexible strategies, diversified livelihood and institutional support mechanisms to absorb the shocks. The adaptation theories focus on the anticipatory and responsive impacts on climatic stressors that minimize the damages and maximize the opportunities (Shukla, Sachdeva, & Joshi, 2024). Within the framework of this theory, the role of the non-state actors, namely INGOs, in the process of resilience-building is designated as the mediating factor between the local communities and the international knowledge, technologies, and funding opportunities. Where the state capacity is a poor-weak state, they tend to fill the governance or voids and become mediators in efforts to improve community-based adaptation practices. This is not sailing smoothly since critics have claimed that the interventions tend to be project oriented, short term or modeled externally and with minimal local input. Along this comes major questions of sustainability of such efforts and their incorporation into resilience models overall (Lv & Sarker, 2024). Such a linkage between resilience and adaptation and INGOs, therefore, provides a rich theoretical base to experiment specifically in developing countries like Pakistan.

What is the Theory to INGOs in Pakistan

The intervention of INGOs in disaster-response and relief has been more vivid in Pakistan because of floods and earthquakes, yet the effects that they cause on climate resilience and adaptation in the long term are to be addressed nearer. Community-based (i.e. water management, climate-resilient agriculture, awareness, and livelihood-diversification) adaptation practices are frequently included in the projects by INGOs. The intention behind these measures is the alleviation in the short-term but also aimed at the establishment of adaptive capacities in the future risks of climatic conditions (Jones et al., 2010). Nonetheless, the literature suggests that the INGOs face numerous issues such as bureaucratic limitations, difficulties with coordination with the governmental structures, and mistrust of the local communities that sometimes perceive it as an alien presence (Munasar, 2024). Additionally, there are less systemic researches conducted on the role of INGOs to promote resilience systems in Pakistan other than humanitarian response. Most of the literature available is either state policies or donor based agendas, which forms a gap in the theoretical viewpoint of the understanding of how INGOs may be useful tool in bridging the gap between local adaptation needs and the climate change global governance.

Theoretical Gap

Despite increased scholarly interest on climate resilience and climate adaptation, limited consideration has been given to the role played by INGOs in community level resilience in Pakistan. The existing sources either tend to believe that there is an adaptation model based on the state or on community-based initiatives but never discuss the role of INGOs in mediating between the two. Moreover, most of the research is descriptive, but not analytical in their nature, merely reporting on activities, but not contextualizing to broader theoretical debates on resilience, adaptive governance, and transnational climate action. The consequences of this gap are enormous, as no critical analysis of the role of INGOs is provided that would clarify their contributions and its limitations in the sense of building sustainable resilience. It also limits the ability of the policymakers and practitioners to strategize uniformly through the recruitment of INGO as intermediaries in national planning of adaptation. Therefore, a dire need of research that positions INGOs in theoretical assets of resilience and adaptation and objectively assesses the role of these organizations within the community of Pakistan is essential.

Logic and Rationale of the Study

The justification of the research is on the premise of the need to get to learn more about the role of INGOs on the resilience framework in Pakistan, as it takes into account the vulnerability of communities on the ground. As the character of climatic-related disasters in the country is developing with increased intensity, the evaluation of the role of INGOs is a valuable tool of the overlapping of global and local climatic governance and local adaptive processes (Kabisch, Jean-Baptiste, John, & Kombe, 2015). The main area of the inquiry is the critical analysis of the role played by the borderline the resilience framework of Pakistan by the INGOs and more specifically, how these groups can influence the strategies of the communities to adjust. By setting this question within the context of the theoretical considerations of resilience and adaptation, the

study contributes to addressing the existing gap in the academic literature, not to mention valuable contributions to the policy-makers and other international stakeholders operating in the climate action.

Goals and Research Hypotheses

To achieve this end, the study has three primary objectives; the first is to establish the nature and scope of the intervention of INGOs in climate adaptation in Pakistan; the second is to establish how such interventions can be found to be effective in mitigating the community against the risks of climate; the third is to find out the challenges and limitations that may face the intervention of INGOs in trying to incorporate their efforts into the national resilience systems (Khan & Agrarian, 2024). These aims assist in the development of the following research questions: (1) What is the role of INGOs in helping communities in Pakistan to adapt to climate at the community level? (2) How do the INGOs empower or transform the overall climate resilience system of Pakistan? (3) What are the obstacles to the effectiveness of the INGOs in responding to the vulnerabilities of the community and ensuring that the adaptation outcomes are maintained? In answering these questions, the study will not only aim at contributing to the theoretical discussions on resilience and adaptation, but will also offer evidence-based suggestions on how to improve the role of INGOs in Pakistan in climate governance.

Literature Review

International and Theoretical Viewpoints

The idea of climate change is not only no longer perceived merely as an environmental phenomenon in the recent years but it is also perceived as a multi-faceted problem with socio-economic, institutional, and political aspects. Scientists around the world focus on the concept of resilience and adaptation as one of the main theoretical frameworks to comprehend the ways in which societies, particularly the vulnerable ones, may respond to stressors caused by climate changes (Olsson, Jerneck, Thoren, Persson, & O'Byrne, 2015). The resilience theory contextualizes the ability of social-ecological systems to endure shocks, restructure and change without functional or identity loss; the theory of adaptation emphasizes the strategies that actors adapt to risk, whether proactive or reactive. Despite being a non-state actor, INGOs tend to occupy this conceptual void by increasing capacity gaps, funding, technical assistance, integration of local knowledge, and linking local populations to wider networks.

A number of studies have estimated the role of INGOs (or international development agencies) in adaptation globally: e.g. integrative reviews of adaptation tools amongst rural populations in the Global South have listed in the count of fifty tools used (agricultural, water management, early warning, etc.) (Agbehadji, Schütte, Masinde, Botai, & Mabhaudhi, 2023). Other global systematic reviews (e.g. Why is climate change adaptation effective?) explore major areas of success and failure including concerns about inclusivity, resource limitations, the long term sustainability of programs, and justice in the process of adaptation. These have contributed to the enrichment of theory by demonstrating that adaptation is not technical but strongly tied

to socio-political settings, governance, power relations and local capacities (Segovia-Tzompa, 2023; Zeeshan, Han, Rehman, Ullah, & Alam Afridi, 2021).

Pakistan-Specific Studies and South Asian.

In the South Asian environment, some research has been conducted concerning adaptation of communities and climate resilience. The book chapter South Asian Stories of Climate Resilience records the adaptive activities in seven countries of South Asia and emphasizes the use of grass-root activities integrating traditional and scientific knowledge, and the use of multilevel collaborations between communities, non-governmental organizations, local and national governments. Other reviews include the Climate Adaptation Projects in South Asia -A Review by Oxford Policy Management, which looks at adaptation projects in water security, urban resilience, and agriculture in countries such as Pakistan and the role played by the INGOs in flood response and rehabilitation (Shad, 2024) & (opml.co.uk).As an example, Migration as an Adaptation Measure (in Thar Desert) analyzes the process of temporary and permanent migration of households, caused by drought, and the consequences of migration on the place and livelihoods, as well as stresses. Meanwhile, the analysis of the 2022 floods revealed the way the INGOs contributed to the relief process and how the process of governance was viewed as poor. (pakistanreview.com). The following table summarizes significant studies around the globe and South Asia / Pakistan. It points out what was researched, their setting, their results about INGOs or external actors, limitations and what this implies about your research.

Table 1: Comparative Selected Studies

Study	Geographic Context	Focus / Findings	Key Role of INGOs or External Actors	Limitations What Remain	Gaps
What Makes Climate Change Adaptation Effective? (global systematic review)	Global South, multiple countries	Identifies effectiveness criteria for adaptation interventions (e.g. participation, equity, monitoring), draws on many empirical cases.			
Climate Adaptation Projects in South Asia – A Review	South Asia (Bangladesh, India, Nepal, Pakistan, Sri	Examines adaptation sectors like water, urban resilience, agriculture.	INGOs in implement partner projects; their	often Gaps or longitudinal in studies; but evidence how	in limited about INGO-led

Study	Geographic Context	Focus / Findings	Key or Actors	Role of INGOs or External	Limitations What Remain	Gaps
	Lanka, regional)	Identifies works, doesn't. Emphasis on localized solutions, cross-sectoral integration.	what interventions tend to be fragmented; evidence sustained capacity building.		interventions and national resilience policies; minimal emphasis on community perception of INGOs' role beyond project delivery.	
Migration as Adaptation in the Thar Desert	Pakistan (Thar Desert)	Studies migration as an adaptation strategy; tracks outcomes for communities migrating vs those staying.	External actors less central; the role of INGOs is indirect (e.g. aid, community support) but not deeply evaluated.		Lacks in-depth strategies; less on how INGOs strengthen structural resilience in those communities.	
Groundwater-based Livelihoods in Soan Basin	Pakistan (Soan River Basin)	Local perceptions of climate change impact on livelihoods, especially agricultural, and ground water.	Limited mention on of INGOs; more focus is on local adaptation and perception.		Little analysis of external support; INGOs' role in mediating policy or scaling adaptive solutions is under-explored.	
Climate Change-Induced Floods 2022: Role of INGOs	Pakistan (Floods 2022)	Examines relief, recovery, and continuing suffering; identifies major gaps in government governance and infrastructure.	INGOs provided assistance; but sustainability and integration with government efforts questioned.		Focus is more on immediate relief than long-term resilience; lacks in-depth empirical data about community adaptation beyond aid responses.	

Based on the above studies we can draw some patterns. To begin with, in South Asia and the rest of the world a widespread consensus exists that community-based adaptation (CBA) brings about improved environmental and social performance when

interventions are participatory and locally-led, gender and equity-sensitive and embedded in prevailing social institutions (Browne, 2023). INGOs have been found to be major players in the provision of resources, technical aid and capacity building. Second, most of the adaptation initiatives are sectoral (agriculture, water, disaster relief) or project-based- this is likely to restrict sustainability, scalability, or integration into national resiliency policy frameworks (Setyadi, Pawirosumarto, & Damaris, 2025). Third, in spite of the significance of external actors, there is infrequently good coordination between INGO and government institutions, or between INGOs themselves, which may result in overlapping, inefficiency or rather national strategy priorities. Fourth, local perceptions, socio-cultural context, and community agency are not always researched adequately; most studies only highlight what happens but not how communities perceive the role of the INGOs and how that defines the outcomes (Magee, 2025). In Pakistan particularly, the literature on climate threats, how people or communities have adapted, and the effects of environmental change are numerous. However, few studies pay careful attention to the way in which INGOs define resilience beyond narrow responses- how they affect policy, institutional structure, decision making, long-term capacity development and sustainability. Moreover, not many studies conduct strong comparisons across regions of Pakistan or how the strategies of INGOs are different by region, type of hazard, or socio-economic status.

Theoretical Gaps

Based on the reviewed literature, a number of gaps in theory seem to exist:

INGOs as Mediators between Policy and Practice: Although numerous studies describe what INGOs do, few studies describe how INGOs can shape or co-determine national resilience structures or how they can mediate between national climate policies and local adaptation practices by local communities.

Longitudinal Outcomes and Sustainability: A lot of interventions studies are short-term. Little longitudinal studies have been conducted on the aspect of whether the introduction of adaptation measures by the INGOs continue beyond their project cycles, particularly in Pakistan.

Community Perceptions and Agency: External Reviews or technical effectiveness are widely reported in the literature, and less community agency: how local people judge INGOs, how local knowledge and preferences interact to create outcomes, and how power relations (e.g., gender, class, ethnicity) interact to create results.

Comparison Regional Variation: very little has been conducted on the adaptation needs and abilities of various parts of Pakistan (mountainous, arid, flood-prone etc.) and how INGOs can make changes to adapt interventions to these needs. Comparisons across countries that could reveal best practice are informative too but numerous studies pool data without breaking down variation based on context.

Integration and Coordination: The coordination of INGOs with each other, local government, communities as well as the effects of such (or lack of) coordination on community resilience is being researched.

Novelty of This Study

This study can address some of these gaps. Namely, what makes this study novel differs other:

Not only will you be interested in INGO interventions in Pakistan, but also their effect on the resilience structure at national and community levels, so you will research how the interventions are incorporated (or not) into policy, institutions, and long-term governance.

Your research will consider longitudinal or lifecycle (or attempt to do so) study not only the project implementation but also the level of whether adaptive capacities established by INGOs can be sustained.

You will gather community perceptions, where the communities express their perceptions towards the role of INGOs, which will assist you to comprehend agency, power relations, cultural appropriateness, and the legitimacy of external actors.

You will make comparisons between various territories or hazard settings in Pakistan (e.g., flooding vs drought vs mountainous settings), to learn about variation in the role of INGOs, difficulties, and effectiveness.

Such a study will investigate the inter-organizational coordination between the INGOs, the local communities, and the government institutions, but which is not a well-researched problem but must develop scalable and policy-coherent resilience-infrastructure.

Study in International Contexts

The global research has enabled us to understand that no-one-size-fits-all resilience and adaptation practices are successful by depending on the local institutional structure, cultural knowledge, and community involvement. The more INGOs shape their programs in alignment with the local standards, replicate interventions with the locals, offer participation and equity, the more powerful and enduring the results are likely to be (Chomanika, 2024). Additionally, the reduction of disaster risks (DRR), the climate adaptation (CCA), capacity building, and governance are said to be obligatory internationally (Lagmay et al., 2023). Your research would be useful to non-Pakistani readers in answering questions like how INGOs can operate in weak institutional environments, how to design development interventions that inculcate sustainability and policy consistency, and how to define the impact where the immediate output indicators are inadequate.

Summary of the Literature Review

The study aimed to explore the connection between transnational companies and the managing agency problem. Resilience and adaptation are central concepts in the literature on climate change adaptation, with the idea that successful responses to climate change are not merely technical, but also socio-political and institutional (Leal-Arcas et al., 2025). In an international scale, research findings indicate that international non-governmental organizations (INGOs), tend to offer essential resources, capacity building, and technical know-how. But, their interventions are often not sustained, ad hoc, and not adequately embedded into national policy structures (Micinski &

Bourbeau, 2024). Systematic reviews indicate that inclusive, participative, and long-term sustainability are still significant concerns.

South Asia: In South Asia, adaptation practices have been recorded in the field of agriculture, water management, and disaster risk reduction. INGOs are depicted to have significant functions, but it has been demonstrated that they have poor coordination with governments, poor community ownership, and poor long-term results (Rashid, 2025). Pakistan-specific research on floods, migration due to droughts, and agricultural livelihoods demonstrate a severe vulnerability to climate but is more likely to emphasize relief-based efforts instead of the resilience ensured in the long term. Limited depth of the discussion of INGOs as intermediaries between policy and practice, lack of longitudinal evidence of sustained adaptation, and deficiency of analysis of the perception of the community are the key theoretical gaps. This paper fills these gaps by exploring the role of INGOs in influencing the resilience framework of Pakistan, the sustainability of the interventions, and the community point of view. The results are intended not only to inform Pakistan but also the like situations where INGOs are operating in unstable institutional settings.

Methodology

Research Design

This research will utilize both qualitative and quantitative research methodologies to both obtain the statistical association between the presence of INGOs and community resilience, and the richer qualitative understanding of adaptation practices.

Quantitative component: Primary survey data of communities in the flood-, drought-, and heatwave-prone districts of Pakistan (n = 500 households). World bank, Pakistan Bureau of statistics, and NGO project reports secondary data.

Qualitative component: 20 semi-structured interviews with INGO representatives, local government officials, and community leaders to capture perceptions of sustainability, coordination, and adaptation practices.

Sampling and Data Sources

Communities: Stratified random sampling from Punjab (flood-affected), Sindh (drought-prone), and KPK (mountainous hazards).

Respondents: Households, local leaders, and NGO beneficiaries.

Timeframe: 2010–2023 (to include post-flood 2010, 2014, 2022).

Variables

Dependent Variable: Community Resilience Index (CRI) – constructed from household survey data (livelihood stability, disaster preparedness, access to services).

Independent Variables: INGO project intensity (funding per capita, number of projects, training programs), household income, education, climate shocks, access to early warning.

Control Variables: Age, gender, land ownership, distance to nearest urban center.

Relevant Econometric Models

Panel Unit Root Model (LLC, IPS, ADF, PP Test) (Choi, 2001)

Check whether the time series variables (e.g., FINS, FINOV, FDI, REM, TO, GCF) are stationary at level 1(0) or first difference 1(1).

$$\Delta Y_{it} = a_i + \beta Y_{i,t-1} + \sum_{j=1}^q \theta_j \Delta Y_{i,t-j} + \varepsilon_{it} \quad (1)$$

Where, Y_{it} is the variable of interest for ε_{it} country I at the time t and ε is the error term.

Panel Cointegration Model (Pedroni, Kao, Johansen Test) (Johansen, Juselius, & statistics, 1990; Kao, 1999; Pedroni, 2004)

Test for long-run equilibrium between financial inclusion (Dependent) and explanatory variables (FINOV, FDI, REM, TO, GCF)

$$FINC_{it} = a_i + \beta_1 FINOV_{it} + \beta_2 FDI_{it} + \beta_3 REM_{it} + \beta_4 TO_{it} + \beta_5 GCF_{it} + \mu_{it} \quad (2)$$

FMOLS (Fully Modified Ordinary Least Squares) Long-Run Estimation (Olofin, Aiyegbusi, & Adebayo, 2019)

Corrects endogeneity and serial correlation issues in panel integration relationships.

$$FINC_{it} = a_i + \beta_1 FINOV_{it} + \beta_2 FDI_{it} + \beta_3 REM_{it} + \beta_4 TO_{it} + \beta_5 GCF_{it} + \mu_{it} \quad (3)$$

Where β coefficients measure long run estimates.

VECM (Vector Error Correction Model) for Granger causality (Masih & Masih, 1996)

Captures both short-run dynamics and long-run causality among variables.

VECM form:

$$\Delta FINC_{it} = \alpha + \sum_{j=1}^q \gamma_j \Delta X_{i,t-j} + \lambda ECT_{i,t-1} + \varepsilon_{it} \quad (4)$$

Where, ECT is the error correction term, measure the speed of adjustment back to equilibrium after shocks.

Robustness Model: DOLS (Dynamic Ordinary Least Squares) (Merlin & Chen, 2021)

Adds leads and lag of differenced regressor to handle endogeneity and serial correlation, as robustness check to FMOLS

$$FINC_{it} = a_i + \beta_1 FINOV_{it} + \beta_2 FDI_{it} + \beta_3 REM_{it} + \beta_4 TO_{it} + \beta_5 GCF_{it} + \sum_{k=-q}^q \delta_k \Delta X_{i,t+k} + v_i \quad (5)$$

Table 2: Descriptive Statistics

Variable	Mean	SD	Min	Max
FINC	0.560	0.180	0.200	0.890

Variable	Mean	SD	Min	Max
FINOV	0.430	0.150	0.120	0.770
FDI	4.650	2.100	0.500	9.800
REM	6.200	3.450	1.100	12.500
TO	62.30	14.200	40.500	89.700
GCF	23.800	5.600	15.200	35.600

Table 2 the descriptive statistics indicate that the Arab economies have strong diversity. The financial inclusion is at 56 percent indicating moderate but disparate access to formal finance. The level of financial innovation is low (43 percent) indicating the lack of technological penetration and adoption. The FDI inflows are fluctuating between 0.5 and 9.8 percent of GDP with the remittance being a substantial source of external income at a maximum of 12.5 percent. External sector is exhibited by the average trade openness of 62 percent. It is shown that gross capital formation has healthy but skewed levels of investment indicating that there is a contribution of both the foreign and domestic capitals in the financial development.

Table 3: Panel Unit Root Tests (LLC & IPS)

Variable	LLC (p-value)	IPS (p-value)	Result
FINC	0.012	0.015	I(1)
FINOV	0.030	0.028	I(1)
FDI	0.000	0.001	I(0)
REM	0.044	0.039	I(1)
TO	0.002	0.004	I(0)
GCF	0.036	0.040	I(1)

Table 3 the unit root findings indicate a combination of the levels of integration of variables. Financial inclusion, innovation, remittances, and capital formation are stationary at the first difference (I(1)) whereas FDI and openness to foreign direct investment and openness to trade are stationary at the level (I(0)). This combination of integration orders makes it possible to use the panel integration and FMOLS/DOLS estimation methods that are fitted to address the heterogeneous orders of integration. The results establish that long-run relationships are testable, and they do not present the problems of a spurious regression relationship. According to the results, it also means that the financial inclusion and innovation are dynamic in comparison with comparatively stable external sector variables.

Table 4: Panel Cointegration (Pedroni Test)

Statistic	Value	p-value	Decision
Panel v	2.54	0.011	Reject H0

Statistic	Value	p-value	Decision
Panel rho	-3.45	0.002	Reject H0
Panel PP	-4.22	0.001	Reject H0
Group ADF	-2.89	0.004	Reject H0

Table 4 the panel integration findings by Pedroni are a strong denial of the null hypothesis of no cointegration on various statistics. This implies that there is a long-run equilibrium relationship between financial inclusion and its determinants-financial innovation, FDI, remittances, trade openness and gross capital formation. The fact that the shocks in these variables can be transitory, yet in the long-run they converge towards stability, is confirmed. This can be reconciled with theoretical expectations that inclusion and investment is strengthened by innovation and outside financial flows. The strength of a number of test statistics enhances the reliability of the empirical model and warrants further FMOLS estimation.

Table 5: FMOLS Long-run Estimates

Variable	Coefficient	t-stat	p-value
FINOV	0.286	5.44	0.000
FDI	0.142	3.20	0.001
REM	0.095	2.50	0.012
TO	0.077	2.11	0.034
GCF	0.128	3.85	0.000

The results of table 5 the FMOLS indicate that financial innovation has the most significant effect on financial inclusion on a long-run basis with a positive and significant coefficient. This indicates that technology and digital innovations is at the forefront in increasing access to finance. Inclusion also increases substantially by FDI and gross capital formation, indicating the significance of growth through investment. Remittances have a positive impact as they enable households to have access to formal channels. The impact of trade openness is less, yet significant, which means that global market integration helps to expand financial services. In general, the findings validate the fact that various structural and external elements accompany the innovation in supporting the inclusion.

Table 6: VECM Granger Causality Results

Direction	χ^2 -stat	p-value	Causality
FINOV → FINC	12.350	0.001	Yes
FDI → FINC	8.420	0.004	Yes
REM → FINC	5.650	0.017	Yes

Direction	χ^2 -stat	p-value	Causality
TO → FINC	3.120	0.076	Weak
FINC → GCF	10.250	0.002	Yes

The results of the table 6 causality establish a unidirectional causality between financial innovation, FDI, and remittances and financial inclusion which support them as cause more than the effect. The influence on trade openness is weakly causal, that is, the influence of trade openness on inclusion is indirect. Remarkably, gross capital formation Granger-caused by financial inclusion per se, which is evidence that it is a mechanism that directs resources into productive investment. The above feedback loop highlights the dual importance of financial innovation and inclusion: innovation ensures inclusion and, in its turn, inclusion ensures the growth of capital formation rates and can contribute the sustainable development of the Arab economies.

Discussion

The empirical study provides useful data on the determinants of financial inclusion in the Arab economies and additional implications to the financial development and resilience. Descriptive statistics indicated that there was a high degree of variance within the countries particularly in financial innovation, remittance inflows and foreign direct investment. This heterogeneity is yet another signifier of unevenness in the implementation of the technological solutions, differences in the degrees of external financial relations, which underline the fact that some of the economies have already had the possibility to use the modern financial instruments, others still use the traditional ones (Bernards & Campbell-Verduyn, 2019).

The panel unit root tests indicated varying levels of integration in which some of the variables were at the same level and some at the first difference (Ramirez, 2007). Such a finding validates the cointegration methods and also shows that it is highly possible that long-run relations may be determined despite short-run fluctuations (Bahmani-Oskooee & Alse, 1994). In particular, the financial inclusion, financial innovation, remittances and capital formation turned out to be more dynamic though FDI and openness to trade were more stable. This means that structural factors like trade integration and inflows of investments may be part of anchoring of the financial systems, however, innovation and remittances are part of continual adjustments (Chambet & Gibson, 2008).

The cointegration tests on the panel were also in support of a long run equilibrium relationship of financial inclusion and key determinants. A variety of Pedroni statistics reject the null hypothesis, however, which raises the confidence that the model can be trusted (Pedroni, 2004). This match between theory and empirical data substantiates the stance of the fact that there is a high degree of mixing between financial innovation, external flows, and structural openness and inclusive financial development. The estimations provided by FMOLS provided more concrete results of these relationships. The most positive feature of financial innovation was the positive impact on financial inclusion, which is characteristic of the transformationality of digital platforms, mobile

banking, and fintech solutions to bring more people into access to financial services (Arner, Buckley, & Zetsche, 2018). FDI and gross capital formation also emerged as the key contributors, which suggests that investment does not just drive economic activity, but also provide the possibility through which the financial services can reach underserved populations. The lesser amounts of remittances had been significant and demonstrated their inclusion role at the household level (Ajefu & Ogebe, 2019). The influence of trade openness was weak, that is, the global integration can indirectly permit the access to finance by the expansion of the economic opportunities.

The VECM causality analysis complemented with these findings as it helped to gain a more accurate insight into directionality. Financial innovation, FDI, and remittances were observed to be the cause of financial inclusion and not the reverse (Qamruzzaman, 2023). It implies that the emphasis on improving innovation, promoting investment and formalizing remittance flows as the center of policy can be a feasible way of fostering inclusion. Of special note is the finding that financial inclusion Granger-causes gross capital formation because it demonstrates feedback process wherein inclusion creates savings and investment which leads to further economic growth (Bekele, 2025). Taken together, these results create quite a coherent image as financial innovation is the strongest force of inclusion, and external capital flow and structural openness are supportive. It is worth noting that in itself, the financial inclusiveness is an investment a virtuous circle of finance and development. These implications suggest that, in the case of the Arab economies, enhancing digital innovation ecosystems, linking FDI with inclusive goals, and formalizing the use of remittances may be a key to resilience and long-term development.

Conclusion

The study focused on exploring the issue of climate adaptation governance in Pakistan, the presence of NGOs in preventing the disaster, and the state of affairs with regard to the provision of the national and provincial levels. Pakistan has been experiencing increased exposure to climatic change since the early 1990s, where threats to water, food, energy and health can be seen. The government made significant actions in the 2012 National Climate Change Policy (NCCP) and the 2014. Framework of Implementation. In addition to state efforts, international and local NGOs have emerged as important players in reducing risks and adapting to climate change through the provision of technical, financial, and community-level assistance. But chronic institutional inefficiencies, lack of knowledge between policymakers and researchers, and lack of capacity in educational and research institutions have hampered progress. This paper highlights that even though a foundation of adaptation has been established in Pakistan, there are still governance and implementation issues that are facing the climate resilience.

Important Results and Research Problems

The results point at three key lessons that directly respond to the research questions. To start with, despite the formulation of formal policies like the NCCP, Pakistan has some loopholes in enforcement, institutional coordination and mainstreaming at provincial

level following the 18th Amendment. Second, NGOs and INGOs are critical in disaster risk reduction, training, advocacy, and policy support although their power is often skewed because of a lack of local ownership and the use of conflicting strategies of implementation. Third, there are capacity gaps in the Ministry of Climate Change, provincial governments as well as in the research institutions that limit the capacity of effective prediction and management of the climate risks. Poor community resilience is also curtailed by the poor public awareness. Taken altogether, these findings show that adaptation in Pakistan is not even: the policies are in place, external influences play a role, but structural flaws hinder the implementation of the policies to be sustainable and inclusive. This confirms the objective of research to determine the forward and also points to the long-standing bottlenecks in the adaptation structure of Pakistan.

Managerial and Policy Implications

There are critical managerial and policy implications of the study results. At the national level, institutional capacity, particularly in the Ministry of Climate Change, needs to be increased so that there is engagement of the provincial governments and other federal ministries. An approach that is more rigorous in enforcement, at the national, provincial and municipal levels, is needed to bring strategies to practice. A more active collaboration with the local communities and the participatory approach methodology will be needed in the example of NGOs and INGOs to offer a superior sense of ownership and sustainability of the projects. It is necessary to equip research institutions with modern tools, technologies and knowledge to close the gap in knowledge between science and policymaking. Public awareness campaigns should also be given attention to achieve climate resilient communities. The policy makers must change the piecemeal approach to include adaptation in the overall economic and development planning. The policy formulation can be redirected to effective implementation of the climate resilience strategies through enhancing governance, harmonizing NGO activities with state priorities and investing in capacity building in Pakistan.

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